PART TWO

INVESTING IN AGRICULTURAL AND RURAL RESOURCES

China's agricultural and rural development in the early 21st century
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CHAPTER 5

PREPARING FOR LABOUR MIGRATION

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5.1 PREPARING FOR MIGRATION OFF THE FARM

CCICED ARD Task Force members

All modern nations in the world—in Europe, North America and Asia—are urban, with robust industrial and service economies. There are no high-income countries in the world that have more than 7% of their populations reliant on agriculture, or have more than 10% of their people living in rural areas. None of these nations, however, started out with this structure. At some time in the past they were all similar to China's society in the early 1980s, when most of the population was living in rural areas and engaged in farming. From international experience, one of the most defining characteristics of successful development is transformation from rural to urban societies based on industry rather than agriculture. The development of labour markets and access to off-farm jobs is the conduit through which the shift of population from rural to urban and agriculture to industry occurs.

CHINA'S LABOUR SHIFTS

Off-farm work has emerged as the main source of income growth for rural households. By 2003, half of the members of China's rural labour force earned at least part of their income from off-farm jobs; more than 85% of households had at least one person working off the farm. Internal migration has become the most common way for rural labourers to get a job off the farm. More than 100 million migrants now live and work outside of their home villages. More than 75% of 16–20-year-olds work off the farm in cities far away from their homes. A veritable flood of young and relatively well-educated workers has been flowing towards China's cities and into industrial and service sector jobs in recent years. Self-employment opportuni-

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ties in the rural economy have also risen rapidly during the past two decades, and the quality of these micro-enterprises has steadily improved. The firms, although household-based and extremely labour intensive, provide employment for more than 80 million rural residents in more than 50 million households.

OFF-FARM EMPLOYMENT AND PRODUCTIVITY, INCOME, POVERTY AND INEQUALITY

The shift of the rural population off the farm into wage-earning jobs and self-employment has generated large increases in productivity and is responsible for most of the increase in rural incomes since the mid 1980s. Large increases in productivity are generated by moving low-productivity workers from farms to more-productive manufacturing and service-sector jobs. For example, during the 20th century, more than 60% of the rise in productivity in the fast-growing Asian economies is attributed to the shift of the labour force from rural to urban areas. Research shows that about 50% of the rise in productivity in China has come from moving rural workers into off-farm jobs.

The role of off-farm work in raising rural incomes is significant. Between 1980 and 2000, rural household income per capita rose by 4% per year, almost all of it from the off-farm sector. The importance of off-farm employment is even more significant when viewed from the household's perspective. When households are able to place a member into an off-farm job, household income rises, on average, by 56%.

Off-farm employment is the primary engine of poverty reduction and in recent years has begun to aid in the reduction of rural income inequality. Economic growth and access to off-farm employment were by far the greatest sources of poverty reduction during the 1980s and 1990s. The increase in participation of young men and women from poor, rural areas demonstrates the pervasiveness of the penetration of labour markets into poor areas. For example, the participation rates of 16–25-year-old men and women from poor areas in wage-earning activities rose from about 15% in 1990 to nearly 70% in 2000.

Although off-farm income was increasing inequality during the late 1980s and early 1990s, since 1995, as more and more households have found jobs off the farm, wage-earning activities, especially the earnings of migrants, have begun to reduce inequality. Access to off-farm employment was by far the most important source of

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the reduction in inequality. In the same way that other East Asian countries, during their periods of rapid development, experienced 'growth with equity', China's income disparities have moderated, and this has been almost exclusively due to the rapid rise in more-equally distributed wage-earning jobs. China's rural Gini coefficient fell from 0.42 to 0.38 between 1995 and 2002.

ENABLING FACTORS

Rapid economic growth has been responsible for the strong expansion of off-farm employment for rural workers. China's continued rural transformation will depend on the demand for labour generated by the industrial and service sectors. Importantly, the key industries in job creation are mostly in the market-oriented, private sector.

As China's economy has developed and the incentives that drive employment and other business decisions have become more focused on profits, labour markets have emerged and have gradually begun to function well. Research supports this assertion, especially work on the off-farm sector's *returns to education*—the relationship between investment in education and earnings. Returns to education in China increased during the 1990s. For example, the return to education for those 30 years of age reached more than 10% by 2000; the return to education in the migrant labour force is more than 13%. As these returns have increased, the importance to households of investing in education has risen, since higher wages and access to off-farm jobs depend inherently on access to education.

While the rising demand for rural workers was the key to increasing off-farm employment, a number of other factors also allowed rural residents to find off-farm jobs. Despite the persistence of China's household registration system and the artificial barriers that it raised during the planning era, restrictions on movement around China and into cities for rural residents were gradually relaxed throughout the 1980s and 1990s. In the countryside, the initial worries about land-tenure insecurity proved unfounded and, as land rights improved and rental markets emerged, individuals and families have been increasingly willing to leave their rural homes. Rules and regulations for self-employment are minimal and the ease of entry into many sectors, such as construction, transportation, trading, retail and small-scale manufacturing, has encouraged those with capital and entrepreneurship to become self-employed in search of higher returns. Today, China's markets for wage-earning workers and for the self-employed are among the fastest growing and most competitive of all markets.

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REMAINING CONSTRAINTS

Not enough jobs and lack of education (poor human capital) are the main constraints to future growth of off-farm employment. While much progress has been made in the management of China's industrial structure, many policies of the past and present distort the relative demand for labour and capital. For example, an inordinate proportion of loans from the nation's banking system are targeted for capital-intensive industries that provide relatively little employment, while many medium and small enterprises are unable to obtain enough financing.

While the dual urban–rural household registration system does not act directly as a barrier, the lack of basic services for rural migrants is undoubtedly slowing China's transformation. Migrants still face discrimination in entering urban school systems, despite recent changes in regulations. Private health clinics that are affordable for rural migrants are heavily regulated, frequently to the point to which they are driven underground. Housing policies in the cities have not promoted the emergence of a low-cost housing sector—either for sale or rent. There is little private housing available to migrants—especially in the larger, faster-growing municipalities. Health insurance, unemployment insurance and social security are still unavailable to rural workers. Above all, rural China's weak education system—especially in poor areas—and its poorly developed system of skills-training pose the largest threats to the long-run growth of the economy. Even with the government's recent efforts to improve education, the weakness of rural education is evident in many dimensions. For every 100 yuan spent by the government on an urban primary student, only 20 yuan are spent on rural students. The difference is even greater for middle school.

The quality of rural education is poor. There is almost no country in the world in which primary education is not free. Other countries support primary and secondary education for the simple reason that it makes economic sense to do so—the social return is far above the private return. And while private returns are high and most rural families are willing to invest heavily in the education of their children, the current system often puts a burden on rural households. China's rural households, especially in poor areas, spend an amount that is equivalent to up to half of per-capita income on elementary school fees and even more (an amount that is equivalent to a level that exceeds per-capita income) on middle-school fees. In many cases, they are unable to afford high school and college, in the rare cases that students are able to gain entry. The main problem, of course, is lack of funding. Part

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of this problem is structural. In China, local governments still bear an unusually large part of the burden for financing primary and secondary-school education. In most modern nations, senior levels of government provide a large part of all basic educational services. With the rise of migration in China, local governments not only will have fewer resources to finance local education, but also will have increasingly less incentive to provide high-quality education, since those that get educated will almost certainly leave the local economy. Moreover, it has been shown that when the cost of education is lower (because of full or mostly full subsidies from the government), girls are more likely to attend school (since some families will be less willing to spend scarce household resources on their daughters).

The low level of funding and poor quality of rural education manifests in many ways. Although attendance rates in primary schools have risen in recent years, drop-outs, repetition of grades and poor grades still plague many schools, especially those in poor, remote and minority regions. Research has shown that young girls in some areas are especially vulnerable. The greatest discrepancies occur in secondary school. Despite rules on mandatory nine-year education, the drop-out rate of rural children is more than 10–20 times that of urban children. And, while upper-middle-school education is becoming nearly universal for students in many cities, it is still unusual for households in many rural areas. Entrance to college is rare and almost unheard of in most villages. Hence, in a society that is endowed with labour, access to those services that enhance human capital and raise the returns to labour are extremely unequal. If not rectified soon, this will almost certainly become a bottleneck for development.

POLICY OPTIONS

Unfortunately, there are few, new policy ideas for reducing barriers to the continued expansion of off-farm employment. Most fundamentally, increased off-farm employment depends on *new jobs and enhancing human capital*.

On the side of demand for labour, rapid economic growth is the only true engine of employment growth, especially in an economy like that of China, in which labour-markets function reasonably well and where many industries are relatively unregulated. Policies that promote labour-intensive manufacturing and service provision are needed, and policies to minimise investment into, and loans for, capital-intensive

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industries should be based on profitability and not on other criteria. Any measure that eliminates distortions in investment into, and lending for, state-owned enterprises and capital-intensive firms and directs investment to the private sector and labour-intensive firms will be pro-employment.

On the supply side, the experience of developing countries around the world, but especially those of Asia, demonstrates that rural education underpins development. China needs to commit itself to providing free primary and lower-middle-school education. Additional funding to make upper-middle-school and college education attainable for rural students should be implemented. Needs-based scholarship programs are desperately required. In short, the gap in funding between rural and urban education should be eliminated and China should make it a goal to allow all children, regardless of their socioeconomic status, equal access to education. School funding, at least for poor areas, but ideally for all of rural China, should come from the national government. The curriculum for rural residents should be flexible, especially at the middle-school level, to allow both academic and skills-training options. If anything, teacher salaries in rural areas should be raised above those in urban areas to encourage high-quality teaching. Equally ambitious efforts should be focused on providing better health services and health insurance. Above all, even more effort should be made to provide education and health services to those in remote, minority regions.

New and innovative programs are also needed for those who are still young and mobile and have completed their basic education program. Adult training programs that give potential migrants the skills that employers demand will improve the nation's productivity. Experiments with adult education in rural source communities and in urban migrant destinations should begin and be given priority funding.

In the cities, the policy goal should be to offer those of rural origin equal access to housing, education, health and other services. In the long run, there is no good reason for China to maintain a two-tier system of citizenship. Efforts should be made to encourage the construction of low-cost housing that is affordable for rural migrants to buy or rent. The government should consider policies similar to those promoted in other nations. There need to be rules requiring low-cost, affordable housing to be built in some proportion to higher-cost development. Preferential, needs-based mortgage programs will promote home ownership by the poor. At the same time, policies to promote, small, inexpensive private clinics are also needed.

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A variety of education institutions should be fostered. Migrant schools, although informal, should be allowed to help rural residents to bring their children and families with them to the city. The recent changes in rules about opening urban elementary and middle schools to migrants should be continued and their implementation encouraged. It should be a matter of national policy to progressively promote a legal and social environment that will encourage rural workers to move from the countryside to the city and welcome them when they arrive.

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5.2 SELF-EMPLOYMENT, ENTREPRENEURSHIP AND GROWTH IN RURAL CHINA

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Since China initiated its economic reforms in the late 1970s, off-farm employment in rural areas has grown rapidly (de Brauw et al. 2002). The expansion of off-farm employment has increased rural welfare by raising incomes and productivity (Parish et al. 1995; Rozelle 1996). For China to be transformed successfully from an agricultural economy to an industrial one, however, the economy needs more than an emerging off-farm sector; it must also rely on strong and sustained investment and entrepreneurship. One of the key tenets of economic development is the profound restructuring that occurs through those that innovate, bringing capital and new ideas together (Schumpeter 1936).

Given the importance of the entrepreneurial sector, it is somewhat surprising that relatively little attention has been directed at the rise of the self-employment sector in rural China.[1] In fact, the sector was the fastest-growing part of the off-farm

[1] In this paper, self-employment refers to those individuals who are engaged in running non-agricultural enterprises. Although farmers and small-scale livestock operators are also self-employed, we separate them out as the agricultural sector.

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employment sector between 1988 and 1995 (Rozelle et al. 1999). The number of self-employed people in rural China increased from 25 to 52 million, representing almost 40% of all new off-farm jobs created during that period. After 1995, the self-employment sector continued growing at a high rate, although its growth slowed somewhat, relative to migration. In other countries with a much smaller self-employed sector—for example, the United States and Great Britain—there has been much more extensive coverage of self-employment (Evans and Leighton 1989; Evans and Jovanovic 1989; Blanchflower and Oswald 1998).

In another sense, however, the lack of attention might be understandable. In other developing countries, self-employment is not always looked upon as a leading sector of the economy. In fact, some researchers believe that self-employment is primarily a refuge for people who are excluded from formal labour markets (Tokman 1992; Gong et al. 2000). Sceptics frequently raise questions such as how much a person standing at a street corner selling toilet-paper or cigarettes can contribute to economic growth. If most of the self-employment in an economy is of this type, it is easy to see how it could be seen as a sign of a deteriorating economy rather than as a growth pole. Hence, despite the dramatic rise in the number of self-employed, the absence of attention to the sector in the China literature may reflect the same ambivalence.

Recent findings, however, provide strong evidence that shows China's self-employment sector is not a refuge of the rejected and laid off, but rather is becoming increasingly sophisticated and entrepreneurial. By disaggregating the growth in self-employment by occupation and factor intensity, Mohapatra (2004) shows that rural China's self-employment sector is becoming more capital-intensive and participating in ever more complex economic activities. Indeed, based on this evidence, the work concludes that self-employment in rural China should be considered a source of growth of rural China and not a sign of economic distress.

Although some of the recent research on self-employment is convincing, there is little in-depth work trying to understand how entrepreneurs start their enterprises and operate them. If self-employment is growing so fast and becoming more complex, scholars will want to better understand the sector and policy makers need to understand the dynamics of the sector so they can formulate policies to promote its growth. Hence, both economists and policy makers would like to be able to answer a number of outstanding questions. How do individuals start up their enterprises? How are the operations of the firms organised? What is the nature of

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the business environment within which they operate? How well do firms perform in terms of the standard measures from their income statements and balance sheets? Answers to these questions, taken together, will help answer another more fundamental question: are these firms appearing in the rapidly growing, dynamic regions and sectors of China or in the more backward ones and are they worth supporting? In our review of the literature, we found that there has been little or no effort to systematically answer these questions. The overall goal of our paper is to answer some of these questions by painting a picture of self-employment in rural China, centring our attention on analysing a rich set of primary data.

DATA

The data-set was collected from a randomly selected, almost nationally representative sample of 60 villages in 6 provinces of rural China (henceforth called the China National Rural Survey or CNRS). To reflect accurately varying income distributions within each province, one county was selected randomly from within each income quintile for the province, as measured by the gross value of industrial output. Two villages were selected randomly within each county. The survey teams used village rosters and their own counts to choose 20 households at random, including both those with their residency permits (*hukou*) in the village and those without. A total of 1199 households was surveyed.

The survey form was designed to collect data on all aspects of the income-earning activities of rural households as well as the determinants of the income sources. The CNRS project team also gathered detailed information on household demographics, wealth, agricultural production and investment. The form includes a detailed section on labour allocation, which records the number of hours and other information about all of the wage-earning and non-wage-earning jobs that each individual in the household performed during 2000.

A major block of the survey, consisting of three subsections, was designed to learn about self-employment in rural China. The first subsection asks the household for detailed information on firm start-up. In particular, this subsection gathers information on the type of business the household was engaged in, the amount of the initial investment, the sources of the initial investment funds, the relationship with the village and its leaders, and the formal ownership structure of the self-employed enterprises at the time of the firm starting up.

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The second part asks firms about the way they organise their operations. Specifically, this part of the survey form solicits information on who within the family operates the firm, and collects information that can be used to describe the firm's use of labour, especially its use of family and hired labour. Finally, we also gather information on the use of capital, its growth rate over time and level of capitalisation.

The final part of the self-employment block gathers information about the firm's financial performance. Enumerators recorded information on all of the firm's revenues and expenses. We use a cash-accounting basis to calculate net income. The survey form also records detailed information on all assets and liabilities, including capital equipment, investment in buildings and land, inventories, accounts receivable, and accounts payable and other debts owed by the firm to banks and private individuals.

GETTING STARTED

One of the most difficult parts of the process facing individuals or groups of individuals that engage in business is the start-up process. During the process, the entrepreneur needs to make many decisions such as the type of business to start up, the ownership structure and the level of initial investment. Using our data on the history of 473 firms, this section centres on understanding how firms launch their businesses. To do so, we first describe the occupational diversification in rural China and show the occupations from which the self-employed came. Next, we examine how people start up self-employed enterprises, especially focusing on the ownership structure of the firm, who it was that initially launched the firm, and the size and sources of the initial investment. Finally, we examine the role of the collective in the start up of the firm.

Occupational diversification and transition into self-employment

Before the economic reforms in the late 1970s, almost all of the people in rural China were exclusively engaged in farming, but policies since then have allowed people to shift out of the sector. A number of policies, especially the household-registration system (or *hukou* system) initiated in 1955, tied rural people to rural areas. Even after de-collectivisation in the late 1970s, however, almost every household was engaged in farming. Land was distributed to each household and, with poorly developed commodity, credit and insurance markets, almost all house-

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holds depended heavily on farming. As the economic reforms unfolded in the 1980s and 1990s, however, leaders relaxed the constraints on the movement of rural labour into the off-farm sector in order to provide labour for the emerging manufacturing and service sectors. Leaders also allowed farmers to pursue non-agricultural activities. By the late 1980s and early 1990s, the passive nature of policy became proactive and leaders began actively promoting an economy that encouraged rural individuals to work for a wage off the farm or to start their own businesses.

With relaxation of the restriction on labour movements, the transition into off-farm occupations has steadily progressed. The labour force participating in off-farm occupations grew from about 15% of the total rural labour force in 1981 to about 43% in 2000 (de Brauw et al. 2002). Specifically, the labour force participating in wage-earning occupations increased from 11% to about 27% ; off-farm self-employed people increased up to 16%.

Despite the shift into off-farm work, households in China are still heavily involved in farming according to our data (Table 5.1). Although about 79% of rural households pursue off-farm occupations, most of them (94%) still participate in farming (Table 5.1, row 2). In particular, of the households that run self-employed businesses, 90% are still involved in farming; of the households pursuing wage-earning occupations, 96% are still involved in farming (Table 5.1, column 3).

While the occupational patterns of individuals are less tied to farming than households, most individuals are still engaged in farming (Table 5.2). According to our data, 19% of individuals in China were working as entrepreneurs in the self-employed sector. However, only a small minority (5%) were doing so full time (Table 5.2, row 3).

Table 5.1 Diversification of occupational choice by households in rural China

Occupation	Frequency	Percentage	Percentage of households also		
			farming	wage-earning	self-employed
Farming only	250	21.1	100.0	0	0
Off-farm jobs	934	78.9	93.5	63.8	42.5
Wage-earning	704	59.5	95.7	100.0	24.7
Self-employment	404	34.1	90.0	43.1	100.0

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Table 5.2 Diversification of occupational choice by individuals in rural China

Occupation	Frequency	Percentage	Cumulative
Farming only	1593	49.98	49.98
Wage-earning only	481	15.09	65.08
Self-employment only	147	4.61	69.69
Farming + wage-earning	525	16.47	86.16
Farming + self-employment	397	12.46	98.62
Wage earning + self	8	0.25	98.87
Farming + wage + self	36	1.13	100.00
Total	3187	100.00	100.00

In addition, there were some that worked an off-farm job and were engaged in self-employment. However, despite the fact that a few focus solely on their self-employed businesses, most are still in farming at the same time. Of all of the individuals who are self-employed, 74% are also in farming or are engaged in farming and work for a wage (Figure 5.1).

The emergence of the self-employed, while beginning during the early 1980s, did not really take off until the late 1980s (Figure 5.2). Before 1989, the entry rate into the self-employed sector is not systematically higher than the exit rate, indicating that during this period the number in the self-employment sector increased little, if at all. After 1989, the entry rate became systematically higher than the exit rate, and self-employment began increasing.

The diversified set of occupations for households and individuals mostly reflects the fact that the move into the self-employed sector has come relatively recently and that today's entrepreneurs actually started in other sectors (Table 5.3). For example, about 19% of the self-employed in China had worked in off-farm labour as wage-earning workers before becoming self-employed (Table 5.3, row 2). On average, these workers-turned-entrepreneurs had worked for an average of eight years before starting their enterprise. About 50% of the currently self-employed people had farmed before switching to self-employment (Table 5.3, row 1). Only about 31% chose self-employment when they initially entered the labour market (Table 5.3, row 3).

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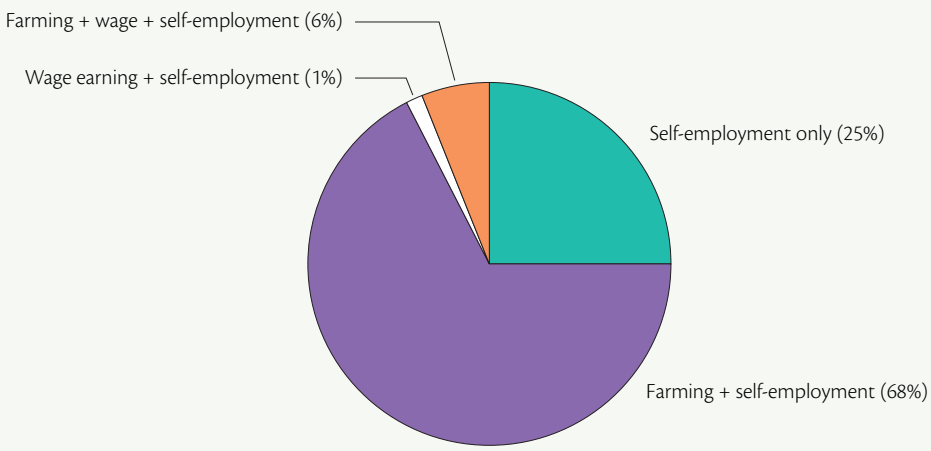

Figure 5.1 Occupation diversification conditional on self-employment

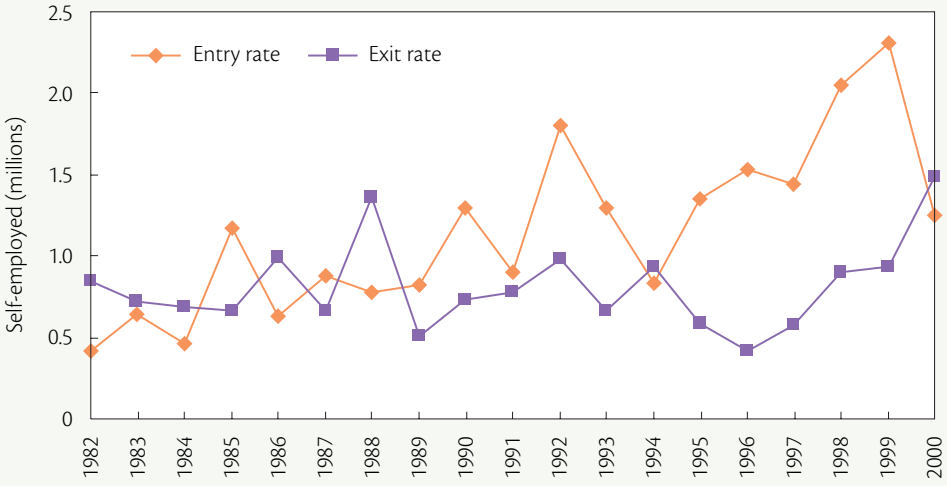

Figure 5.2 Self-employment entry and exit, 1981–2000

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Table 5.3 Transition into self-employment in rural China

Occupation immediately before self-employment	Number	Percentage
Farming	182	50.00
Wage-earning	70	19.23
Self-employment	11	30.77
Total	364	100.00

The people and sources of the funds

Despite the diverse occupational background of individuals before they shifted into self-employment, when individuals launch new firms there are well-established patterns of business operation. Most of the self-employed choose to run their own firms by themselves and do not enter into partnerships (Table 5.4). Indeed, only 7% of self-employed enterprises began as partnerships (Table 5.4, column 2). Instead, an overwhelming majority (93%) of rural self-employed firms are initiated as sole proprietorships.

Those who start up enterprises also share a number of general characteristics, especially when compared with those engaged primarily in wage-earning and farming (Table 5.5). On one hand, the self-employed are more likely to be married and they are older; their marriage status and age are closer to those of farm than wage workers. However, in terms of gender (being male), education level and access to special training, the self-employed are more like wage-earners than farmers. The profile of the self-employed, interestingly, is consistent with the findings of Parish et al. (1995) and de Brauw et al. (2002), who also sought to characterise the off-farm sector using econometric analysis.

Table 5.4 Initial ownership structure and change in ownership in self-employed firms in rural China

	Initial ownership		Current ownership	
	Number	Percentage	Number	Percentage
Sole Proprietorship	427	92.8	430	93.5
Partnership	33	7.2	30	6.5
Total	460	100.0	460	100.0

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Although China's self-employed have a distinct set of characteristics across the nation, they appear to differ fundamentally from the self-employed in other developing countries. For example, in rural Honduras most of the self-employed are young women, in many cases with low levels of education (Ruben and Van Den Berg 2001). In Africa, the majority of micro-enterprises are also owned and operated by women (Mead and Liedholm 1998). Grosh and Somolekae (1996) find that rural micro-enterprise owners in Botswana typically have low levels of education; almost all of them have at most a primary education. China's self-employed also appear to differ from the self-employed in other countries in the amount of experience that they have had before starting up their business. In rural Indonesia, around 50% of the self-employed in the cotton industry are female and are limited to young mothers, widows and the elderly, categories of individuals that probably mean they had little experience in the workforce before they began to be self-employed (Chernichovski and Meesook 1984; Weijland 1999). Clearly, when compared to the self-employed in other developing nations, there appears to be a new class of 'self-employed with Chinese characteristics'.

Perhaps because of the dominance of the sole-proprietorship structure, and given that those in rural China are still relatively poor, with poorly developed capital markets, rural firms in China start off as extremely small and relatively undercapitalised firms (Table 5.6). More than 70% of firms have an initial investment of less than 5000

Table 5.5 Occupational choice: averages and standard deviations of individual characteristics for three occupations—self-employment, farming and wage-earning—in rural China in 2000

	Sample average (overall)	Subsample		
		Self-employment	Farming	Wage-earning
Sex (male)	54% (0.5)	70% (0.5)	44% (0.5)	65% (0.5)
Age	38.0 (13.7)	37.4 (11.0)	42.3 (13.3)	29.7 (11.7)
Marriage (married)	78% (0.4)	86% (0.3)	88% (0.3)	52% (0.5)
Education	6.0 (3.5)	6.7 (3.0)	5.0 (3.5)	7.8 (3.0)
Whether receiving training before	20% (0.4)	40% (0.5)	10% (0.3)	30% (0.5)
Sample probability	100%	15%	56%	29%
Observations	3187	486	1792	909

Note: Standard deviations of the averages are in brackets.

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yuan (about US$610 dollars at official exchange rates) which amounts to only about 40% of the household's annual income (Table 5.6, row 2). In contrast, only about 9% of the self-employed enterprises invest more than 30,000 yuan (Table 5.6, row 4). In fact, so low a level of capitalisation is not surprising in an economy with such labour-intensive enterprises. For example, the average farm in China only has about 1274 yuan of equipment (de Brauw 2002). Clearly, the low level of capitalisation in the self-employed sector is consistent with a farming sector (the other self-employed sector) that also depends on few capital assets.

The size of the initial investment also undoubtedly affects the way that most entrepreneurs raise their initial funding (Table 5.6). Most of the self-employed (64%) are completely self-financed, using only their household's own funds (Table 5.6, row 1). Even for the 35% of the self-employed that rely on borrowed funds, in most cases these funds are supplementary. For the self-employed firms launched in 2000, about 81% of the initial start-up funds come from the family. Consistent with the under-development of credit markets in rural China (Findlay et al. 2003), only a small proportion of the self-employed (26%) obtain any funds from banks. For firms launched in 2000, we find only about 7% of the start-up funds come from banks.

While funding from formal and informal sources of credit is low, given the prevalence of the underdevelopment of credit markets in the developing world, the reliance of self-employed enterprises in other developing countries on bank credit appears to be even lower. For example, 78% of the firms in Kenya are financed by personal savings, while only 2% are funded from banks (Fafchamps et

Table 5.6 Size and sources of initial investment in self-employment firms in rural China

Initial investment (yuan)	Number of firms	Sources of initial investment (percentages)						
		Own only	Banks only	Others[a]	Own & banks	Banks & others	Own & others	Own & banks & others
Total	473	64	4	8	4	15	2	3
0–5,000	335	77	3	7	1	11	0.4	0.6
5,000–30,000	98	37	6	9	10	23	5	9
Above 30,000	40	30	5	10	15	23	8	10

[a] Includes friends, relatives and other people who loaned funds to the self-employed.

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al. 1994, 1995). Similarly, 90% of the firms in Zimbabwe are financed by personal savings while only 3% are funded from banks. In Honduras, start-up funds for self-employed enterprises also rarely came from formal credit sources (Ruben et al. 2001).

The role of collectives

One of the most interesting findings from this study of China, a communist country with a history of heavy government involvement with economic activities, is the almost complete absence of the local state in the start-up of self-employed firms. Independence from the state is a characteristic that makes these firms strikingly different from rural firms that arose in the 1980s and early 1990s. During the 1980s, the relationship between rural firms and the local state was one of close, interlinked ties (Whiting 2001). Most firms—'township and village enterprises' (TVEs)—were owned by the township or village government (Oi 1999). When private firms did emerge, they typically were highly reliant on the collective. Due to the lack of institutionalised property rights and the exclusion of private firms from the state's planned distribution channels, private firms needed the local state's protection and help to access input and output markets. Hence, during the 1980s, most firms were at least somewhat tied to the local state.

Self-employed firms, in contrast, have almost no relationship with the collective when they launch their business (Table 5.7). In our survey, we asked the entrepreneur about a number of different ways that the collective could have provided aid to the firm. Did the village provide land and/or buildings? Were the village leaders co-investors? Does the self-employed firm have a contracting relationship with the local TVE? Despite the long list of questions, 92% of self-employed enterprises stated that they were not related to the collective in any way (Table 5.7, row 1).

In summary, our data show that there is a standard way that the self-employed initiate their businesses in rural China. Most firms are started by individuals as sole proprietorships and only a small number of the self-employed are engaged in partnerships. Most of the self-employed people are males and married; compared with farming people, they are more highly educated. They initially invest little capital; most of the start-up funds come from the family itself while formal credit markets play only a limited role in financing the start-up. Few have any ties with the local state.

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Table 5.7 Relationship between enterprises and collectives in rural China

Relationship with collectives	Percentage of firms
No relationship	92.4
Buy from collective	0.9
Contract from collective	4.0
Rent land from collective	0.6
Rent building from collective	0.4
Cooperate with collective	1.1
Others	0.6

NATURE OF THE ORGANISATION OF SELF-EMPLOYED ENTERPRISES

Once businesses have started up, the self-employed pursue a diverse set of businesses (Figure 5.3). About 25% of the firms in our sample are engaged in wholesaling, retailing and trading activities. These trading firms handle a wide variety of commodities, including household goods, food items, construction materials and electrical equipment. Some firms are simple; the corner family stores that are run out of the first floor of the owner's home, and commodity traders that buy up the output of other farmers in the village and surrounding villages during the harvest season, reselling them in the local seasonal market. Others are complex; such as one household that owned several canal- and river-going barges and bought, sold and delivered bricks and roofing tiles all over the Yangtze River Delta. Moreover, perhaps reflecting the fact that China's service sector is underdeveloped in general (World Bank 2002), 21% of self-employed individuals are running businesses that provide a wide variety of services, such as barber shops, tailor shops and photo finishing. In the beginning, most of the service firms operated in the household's own village; increasingly it is observed (and our data concur) that households are moving to the cities to operate their service-oriented firms (de Brauw 2002). Finally, as might be expected in the rural sector, a significant proportion (14%) is engaged in a farming-related business.

In some sense, the participation of rural households in trade and service provision is similar to the rest of the world. Unlike households in most other nations, however, the rural self-employed in China are involved in a number of less-traditional sectors.

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About 15% of the self-employed run transport and communication businesses and 14% run manufacturing and construction firms. In some villages, there are even some individuals running businesses that require fairly high levels of professional expertise; for example, health-care providers, banking and technological services. For example, there are 12 households in our sample that are engaged in health-care services or have set up clinics in a village. Of these, five households have invested more than 2000 yuan, implying they might have put funds into a building and medical equipment.

Firm structure, family roles and hired labour

In the same way that most self-employed firms began their business activity with the effort of a single member of the family, the ownership structure of the self-employed enterprises in our sample demonstrates a pattern of organisation that mostly relies on a single individual. Interestingly, this approach is different from

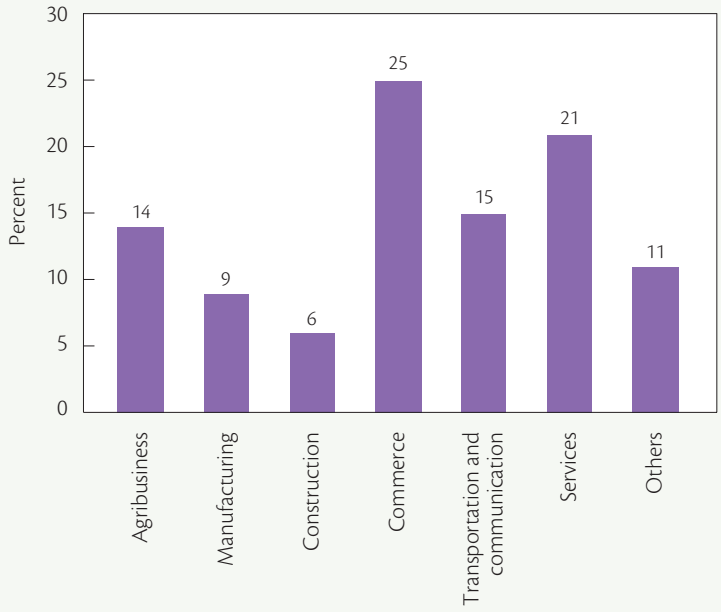

Figure 5.3 Distribution of self-employment across industries in rural China

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the pattern described by Unger (2002). In his book, Unger observed in Xiqiao, a prosperous township in Guangdong Province, that almost all of the self-employed had initially formed partnerships with relatives, friends or neighbours in order to amass sufficient capital and diversify their risk. Unger observed, however, that once the enterprise grew to a certain size, the partnerships usually splintered into smaller, individually run family firms. In contrast, a large majority of the enterprises in our sample began as sole proprietorships and most continued to operate over the life of the firm without changing ownership structure (Table 5.4). According to our data, about 92.8% of the firms were sole proprietorship when they started up (Table 5.4, column 2). By 2000, the percentage being operated as sole proprietorships is almost unchanged at 93.5% (Table 5.4, column 4). It is unclear why the households in our sample differ from those in Unger's study. Given that more than 70% of the enterprises had an initial investment of less than 5000 yuan, it seems plausible that most firms in our sample did not face capital constraints as did those in the Unger sample, which was drawn from the local Textile Chamber of Commerce and contained individuals who were trying to run larger manufacturing firms.

Although self-employed enterprises are family-based, there are many possible combinations of roles different family members could take on. There are fairly strong patterns in rural China (Table 5.8). More than half of China's self-employed firms (53%) are operated solely by the male, household head (Table 5.8, row 1). In these households, although the other family members do not directly participate, they do so indirectly, by shouldering more of the work on the farm. In about 52% of the households with husband-only firms, the head's spouse takes over most of the work on the farm with other family members, while in only 38% of the households with no off-farm occupations is the wife the primary on-farm worker.

There are forms other than husband-only firms. About 25% of the enterprises are operated as intra-family partnerships—mostly jointly run by husband and wife (Table 5.8, row 3). Although our data do not include information on the precise roles of husbands and wives in these jointly run enterprises, Unger (2002) observes that, in Xiqiao, wives often oversee production of family firms while their husbands take care of sales. If so, these firms would be similar to those found in Taiwan, where there is a fairly well-defined division of labour, with the wife overseeing production and the husband doing sales (Greenhalgh 1988). Interestingly, for the firms where husbands and wives share responsibilities, the husband, on average, takes on a greater share of the farm work (53%) than that for the husband-only firms (46%).

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Given the small size of the initial investment, it is not surprising that the number of workers (including the proprietor) in most of the self-employed enterprises is also small (Table 5.9). According to our data, the average number of workers per enterprise in our sample is only 2.3, although there is considerable variation among firms. For example, our data show that about 60% of the enterprises are operated by only one person, the proprietor, working on his or her own (Table 5.9, row 1). In contrast, there are a few enterprises employing a large number of workers; four enterprises in our sample employ more than 40 workers.

Since firms are generally small with only limited employment, most of the firm's labour force comes from the family rather than labour markets (Table 5.10). About 94% of workers in all of the sample enterprises are members of the entrepreneur's

Table 5.8 Composition of family members pursuing rural enterprises in China

Type	Number	Percentage	Cumulative
Husband	252	53.3	53.3
Wife	50	10.1	63.4
Husband and wife	120	25.4	88.8
Child only	30	6.3	95.1
Other	23	4.9	100.0
Total	473	100.0	

Table 5.9 Employment distribution in self-employed enterprises in rural China

Number of employees	Number of enterprises	Percentage	Cumulative
1	283	59.83	59.83
2	126	26.64	86.47
3	31	6.55	93.02
4	11	2.33	95.35
5	6	1.27	96.62
>5	4	3.38	100.00
Total	473	100.00	

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immediate family (Table 5.10, row 1 and column 2). Of the family members, only 1% were reported to have drawn a wage. Some 6% of the workers were non-family members, all of them hired for a wage (Table 5.10, row 1 and column 4).

Like other characteristics of the sample firms, the scale of the enterprise affects hiring decisions. As the size of the firm increases, so does its use of paid labour. For example, the enterprises with fixed assets in the range 60,000–70,000 yuan, on average, hire 43% of their labour force while 57% come from the family (Table 5.10, row 9). Only 28 of the 393 firms that have fixed assets below 10,000 yuan hire workers for a wage.

While the average self-employed enterprise is small, in the aggregate they contribute a significant amount to national employment. In 2000, there were 499 million people in China's rural labour force (China Statistical Press 2001). Our data show about 15% of the rural labour force is self-employed. If our sample is representative and can be used to estimate employment across the nation, we estimate almost 80 million people were involved in self-employed enterprises in 2000. Under these assumptions, given the 712 million people in China's overall labour force (China Statistical Press 2001), this means about 11% of national employment is created by the rural self-employed.

Table 5.10 Employment composition of rural enterprises in China, grouped according to size of fixed asset

Fixed asset (yuan)	Number of enterprises	Percentage of firms hiring labour from labour markets	Percentage of labour from labour market	Percentage of labour from family
Overall	473	9.3	6.0	94.0
0– 5,000	335	6.6	4.1	95.9
5,000–10,000	58	10.3	6.8	93.2
10,000–20,000	29	10.3	5.9	94.1
20,000–30,000	11	9.1	6.1	93.9
30,000–40,000	7	42.9	31.9	68.1
40,000–50,000	9	22.2	11.1	88.9
50,000–60,000	4	0.0	0.0	100.0
60,000–70,000	3	66.7	43.1	56.9
70,000–80,000	1	0.0	0.0	100.0
Above 80,000	16	31.3	24.4	75.6

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Capital growth and investment

Given the shortage of capital in rural China, most self-employed enterprises use only relatively small amounts of capital, although there are exceptions (Table 5.11). On average, China's self-employed enterprises own only about 36,000 yuan of fixed assets, meaning that firms are quite small, and much lower than the fixed assets of the average TVE (Oi 1999; Table 5.11, row 2). The average capitalisation of a TVE in 1995 was 607,000 yuan. Moreover, not only is the average level of fixed assets relatively small, their distribution across enterprises is skewed. Of all enterprises in our sample, 50% have fixed assets of less than 4400 yuan; 80% have fixed assets of less than 20,000 yuan. Despite this, there are a few enterprises with fixed assets more than 50,000 yuan (11%). The largest enterprise in our sample, a manufacturing firm that hires more than 40 people, has assets of more than 1.8 million yuan.

Although self-employed enterprises are small, they have been growing moderately rapidly in terms of their rate of capital accumulation (Table 5.12). Our data show that the fixed-asset holdings of rural self-employed firms increased, on average, about 15% per year (Table 5.12, row 1). If conditioned on the enterprises that made at least one additional investment in their firm's fixed-asset base after their initial start-up investment, the annual rate of increase is about 34%. Perhaps because of the limited ability of the self-employed firms to raise funds and lack of help from the state in facilitating access to formal financial markets, the growth rate of capital in self-employed firms, although fast, is lower than that of TVEs, which was 27% over the period from 1985 to 1995 (Oi 1999).

Table 5.11 Structure of total assets (yuan) of rural enterprises in China in 2000

	Number	Mean	Median	Standard deviation	Minimum	Maximum
Total asset	343	45,454.46	6,661.65	195,753.20	0	2464,997
Fixed asset	353	35,820.30	4,441.96	175,201.00	0	2,164,997
Account receivable and credit	353	9,634.16	400	33,117.08	0	300,000
Liability	353	6,854.75	0	26,552.55	0	330,000
Net equity	353	38,599.71	5,316.67	185,356.20	−138,242.8	2,314,997

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Table 5.12 Fixed asset growth and investment in self-employment firms in rural China

Initial investment (yuan)	Average annual compound growth rate
Overall	15.2
0–5,000	20.4
5,000–10,000	9.8
10,000–15,000	5.9
15,000–20,000	2.4
20,000–25,000	8.1
25,000–30,000	0
Above 30,000	10.5

Despite the relatively modest growth rates, it is still of interest to understand the distribution of growth across firms. Somewhat unexpectedly, the overall growth of the self-employed firms is mainly driven by the small firms. Firms with initial investments of less than 5000 yuan actually grew at a rate that was higher than the overall growth rate of the larger self-employed firms (20% —Table 5.12, row 2). In fact, the growth rate of these small firms is double or even higher than that of the rest of firms. Moreover, consistent with the different growth rates across firm size, there are quite different investment patterns between the small firms and the large ones. After the start-up, the small firms make more frequent investments than the larger firms (Table 5.13 and Figure 5.4). Perhaps because they are more flexible and change technologies or lines of business more rapidly, for the firms with initial investments of less than 5000 yuan, the owners make investments in nearly every subsequent year (Figure 5.4, top and left panel). In contrast, in the firms with an initial investment between 10,000 and 15,000, investments occurred in only 4 of the first 10 years (bottom and left panel). However, it should be noted that although the subsequent investments by small firms are more frequent, those by the larger firms are larger on average (Table 5.13). For example, conditional on the fact that a firm invested, the average investment for the firms with the initial investments between 20,000 and 25,000 is about 9300 yuan (row 5). The average investment size for firms with the initial investment less than 5000 is only about 5500 yuan (row 1).

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Table 5.13 Investment pattern after start-up of self-employment firms in rural China

Initial investment (yuan)	Overall average investment	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
0–5,000	5,476.9	3,316.5 (10.1)	6,262.7 (6.3)	7,292.3 (5.8)	2,691.4 (4.3)	4,532.5 (3.8)	3,811.3 (4.8)	4,372.0 (2.4)	6,400 (1.0)	20,945.5 (1.4)
5,000–10,000	7,022.9	6,976.5 (8.2)	0.0 (0.0)	1,700.0 (2.0)	3,800.0 (4.1)	10,570.2 (2.0)	0.0 (0.0)	18,717.8 (2.0)	6,925.7 (4.1)	0.0 (0.0)
10,000–15,000	8,710.5	6,059.1 (12.5)	9100 (4.2)	0.0 (0.0)	0.0 (0.0)	6,403.5 (4.2)	6,976.5 (8.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
15,000–20,000	10,307.7	5,000 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
20,000–25,000	9,248.8	0.0 (0.0)	1,951.0 (11.1)	0.0 (0.0)	0.0 (0.0)	2,000 (11.1)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
25,000–30,000	0.0	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)

Note: values in brackets are the percentages of firms that invest.

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With lower levels of assets, the accumulation of debt in China's self-employed firms generally is relatively small. In China, in general, firms have built up huge debt relative to their equity. For example, in 1998 the average debt–equity ratios for the state-owned enterprises and the collective enterprises were 320% and 199%, respectively (Naughton and Yang 2004). In contrast, debt is not an important part of the way that assets are financed for self-employed firms and most have low liability (Table 5.14). About 83% of enterprises have liability less than 5000 yuan (Table 5.14, row 3 and column 1). Despite this, only 49% of enterprises have total assets of less than 5000 yuan (Table 5.14, row 1 and column 4).

Table 5.14 Joint distribution of total asset and liability in self-employment firms in rural China

		Liability (yuan)		Total	
		≤5000	>5000	Percentage	Number
Total asset (yuan)	≤5000	47.1%	1.4%	48.5%	207
	>5000	36.1%	15.5%	51.6%	220
Total	Percentage	83.2%	16.9%	100%	
	Number	355	72		427

The joint distribution of assets and liabilities indicates that, overall, the enterprises are financially healthy. Liabilities are only 12% of total assets, which shows the low degree to which enterprise assets are financed through debt. Perhaps this is because the self-employed enterprises are rationed out of the formal credit markets and/or due to the nature of the small initial investments required for labour-intensive, self-employed enterprises. It is possible that both forces are at work. This pattern is the case outside China, and in this way shows China is not unique. Fafchamps et al. (1994, 1995) show that in Kenya and Zimbabwe a considerable percentage of enterprises are rationed out of credit markets; while at the same time a significant percentage of enterprises say that they do not need a loan from banks.

THE BUSINESS ENVIRONMENT

If self-employed enterprises significantly contribute to poverty alleviation and economic growth, then it is important to know what part of the business

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environment is conducive to such enterprises. Several attributes of the business environment have been shown to be important to entrepreneurial activities. For example, communication infrastructure can expand the range of information on technology and markets to help inform entrepreneurial activities (Schmit 1989). Siting businesses close to cities and with access to convenient transportation services are also conducive to business growth because they can lead to lower transaction costs and make it easier for entrepreneurs to gain access to markets (Perkins 2003). An environment with weak credit markets limits the financing ability and thus constrains people from entrepreneurial activities (Eswaran and Kotwal 1986).

Our data[3] show that, like in other countries, these attributes are important in rural China. Households located in villages close to the township seat, are well-off and have good communication facilities and are more likely to have more firms in the self-employment sector (Table 5.15). For example, 40% of surveyed households located in villages close to the township seat participated in the self-employment sector while it was only 26% for other villages (Table 5.15, rows 1 and 2, and column 1). Moreover, households in richer villages are more likely to participate in the self-employment sector than those in poorer villages (Table 5.15, rows 7 and 8, and column 1). If the level of previous income is a good approximation of the degree of financial constraint, it may be that financial constraints are an obstacle to entrepreneurship in rural China. As it does in rural China, financial constraint also impedes entrepreneurship in other countries (Holtz-Eakin et al. 1994; Blanchflower and Oswald 1998; Burke et al. 2000; Dunn and Holtz-Eakin 2000; Paulson and Townsend 2001). Villages with better communication facilities are associated with a higher proportion of self-employed households (Table 5.15).

[3] To understand the business environment in which the firms are operating, the survey team also executed a community-level survey. The survey instrument collects information on the location of the village, the availability of electricity, telephones, radios and televisions, and the number of roads and buses going through the village. We also asked leaders about the general characteristics of the community, its income level, the importance of agriculture and the extent of the non-agricultural industrial development. With the information, we can create a profile of the infrastructure that exists in each village that can support or constrain self-employment. The data are available for two years, 1990 and 2000.

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Table 5.15 Business environment and self-employment in rural China

Business environment in 1990		Percentage of households in self-employment in 2000	Growth between 1990 and 2000 (%)
Distance from the township	Near	40	4.8
	Far	26	4.5
Distance between nearest paved roads and villages	Near	35	4.8
	Far	33	5.2
Number of households having phones	Few	32	5.4
	Many	43	3.3
Level of income	Low	30	5.3
	High	38	4.3
Gross industrial output value	Low	39	7.0
	High	37	2.4

PERFORMANCE OF SELF-EMPLOYED FIRMS

We focus on two important aspects of financial performance: profitability of the self-employed and the financial risk of the enterprises run by them. We first examine their profitability, assessing the performance of self-employed firms by comparing self-employment earnings with wage earnings. We also compare the return on assets of self-employed firms with those of state-owned enterprises (SOEs) and township and village enterprises (TVEs). Finally, we examine the financial risk of the self-employed enterprises, by making comparisons with those of SOEs and TVEs, and the heterogeneity of the financial performance within the self-employment sector.

Profitability

Compared with workers with wage-earning jobs, those that are self-employed in rural China earn more per hour but also assume higher risks (Table 5.16). The self-employed in rural China earn, on average, about 7.8 yuan per hour in 2000 while wage earners earn only about 2 yuan per hour (Table 5.16, column 1). Note, however, that the standard deviation for the earnings of the self-employed is nine times as high as that of wage earners (Table 5.16, column 3).

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Table 5.16 Hourly earning for self-employment and wage jobs in rural China

	Mean	Median	Standard deviation	Minimum	Maximum
Wage-earning	2.0	1.4	3.9	0	109.7
Self-employment	7.8	2.4	36.8	−40.5	500

There are several possible reasons for the relatively higher earnings of self-employment workers. Since many self-employment activities are riskier than wage-earning occupations, part of the self-employment earnings could be thought of as a risk premium. Alternatively, self-employment often requires the use of capital. We have seen that credit is limited. Hence, it is possible that the capital requirement of starting a firm could be imposing a barrier to entry, preventing people from entering the self-employed sector and keeping self-employment earnings at a level higher than wages. Finally, it could be that self-employment earnings contain a return to entrepreneurial ability, a scarce input and one that is not required for wage-earning occupations.

Although self-employment earnings in rural China are higher than wage earnings, this relationship is not typical of many countries. For example, in Kenya only about one quarter of the self-employed enterprises make above the minimum wage of the modern sector, while only 10% earn more than the average wage, indicating that in many cases self-employment is not sufficient by itself to move a household out of poverty (Daniels and Mead 1998; Daniels 1999). In the United States, wage jobs have higher initial earnings and growth of earnings is greater than those of the self-employed (Hamilton 2000).

Self-employment earnings are higher than wage earnings in China, and are higher than the wage that the self-employed could have earned if they had chosen to be a wage earner (Table 5.17). To show this we need to first account for the difference between the characteristics of the self-employed and wage earners. A standard way to show this is to use a wage equation estimated from the same sample, and then create a predicted wage for the self-employed, by forecasting the wage, given the characteristics of the self-employed. Based on the selection and wage equations estimated by using our data-set—and reported in de Brauw (2002)—we can show that, if the self-employed were wage earners, the self-employed would have earned,

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on average, 2.7 yuan per hour, which is higher than the earnings of wage earners but substantially lower than the self-employment earnings, even after we remove the capital income part from the self-employment earnings (Table 5.17, row 1). These findings could indicate two things. First, self-employed are more able in labour markets and earn more. Second, even with the high ability they are more likely to voluntarily choose to be in the sector rather than being forced into the sector.

Not only do the self-employed earn more than the wage earners, the enterprises run by them also have return on assets that are higher than those from other types of enterprises such as SOEs and TVEs (Table 5.18). Return on assets, which is calculated as net profits divided by total assets, is one of the key ratios used to measure the profitability of firms. However, there is one problem with calculating the ratio for the self-employed enterprises. The profit for the enterprises includes a labour component, since most of the self-employed also are functioning as unpaid workers in the enterprises. In calculating the return on asset ratio we thus remove the labour component from the profit by subtracting the predicted wage for the self-employed from the profit. Even after doing this, the ratio of return on assets for self-employed enterprises is 0.98, meaning that, given one dollar of an asset, the self-employed firm will on average generate 0.98 dollar of profits (Table 5.18, row 1 and column 1). The ratio is much higher than those of SOEs and TVEs (0.03 and 0.07, respectively; Table 5.18, rows 2 and 3, and column 1), indicating that assets of self-employed enterprises have returned well according to this measure.

Table 5.17 Predicted wage earnings and capital interest income for the self-employed in rural China, grouped by asset size

	Mean	Wage	Capital income per hour	Difference
Overall	7.8	2.7	0.77	4.33
Bottom 10%	3.9	2.6	0.005	1.3
Low middle	2.4	2.8	0.04	–0.44
High middle	8.8	2.7	0.28	5.8
Top 10%	31.7	3.0	1.32	27.4

Note: The capital income part is calculated as the interest income that the self-employed would have earned if they put funds in banks, instead of investing in self-employed firms. The interest rate used for calculating the interest income is the annual interest rate (2.25%) of deposit (China Statistical Press 2001).

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Compared with SOEs and TVEs, self-employed enterprises can also be said to be financially much less risky.[5] The debt-to-asset ratio for the self-employed enterprises is 0.21, meaning that, on average, 21% of the total assets of the self-employed enterprise is financed through debt (Table 5.18, row 1 and column 2). However, the debt-to-asset ratios for SOEs and TVEs are three times as high (Table 5.18, rows 2 and 3 and column 2), because SOEs and TVEs have been heavily reliant on bank loans to fund their investments. Given the low profitability of SOEs and TVEs, it is possible that they may not always be able to repay debts, including interest payments and principal. Hence, from a financial analyst's point of view, SOEs and TVEs are a greater financial risk.

The heterogeneity of financial performance

While the average self-employed enterprise is more profitable but less financially risky than SOEs and TVEs, their financial performance varies considerably. For example, according to our data, the highest hourly earnings of the self-employed are about 500 yuan per hour (about 65 dollars per hour) while the lowest earnings are negative (–40.5 yuan). In addition, while most of the self-employed enterprises have zero debt, several enterprises have a debt-to-asset ratio higher than 0.80.

Table 5.18 Debt-to-asset ratio of different types of enterprises in rural China

	Return on asset	Debt-to-asset ratio
Self-employed enterprises	0.98	0.21
State-owned enterprises[a]	0.03	0.60
Township and village enterprises[b]	0.07	0.60

[a] China Statistical Press (2001)

[b] China Statistical Press (1999)

[5] We evaluate the financial risk of the self-employed enterprise in terms of how much of the assets are financed through debt. If the enterprise is sufficiently levered, interest expenses may be so high that, under adverse economic conditions, the enterprise may not be capable of paying back. That means financial risk is directly proportional to leverage. We use the total debt to total assets ratio, which is one of the important leverage ratios and is often used by financial analysts, to assess the financial risk of the self-employed enterprises.

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Despite the variations, clear patterns of financial performance exist in the self-employment sector. The self-employed with a higher level of total assets have higher hourly earnings (Table 5.19). For example, the self-employed with asset holdings in the bottom 10% of asset distribution earn only 3.9 yuan per hour. In contrast, those in the top 10% earn about 32 yuan per hour (column 1). In fact, those in the bottom 50% do not earn significantly higher hourly earnings than the corresponding wage earners while the upper 50% earn substantially more.

While returns are higher for the firms with high levels of assets, so is the risk (Table 5.19). Enterprises with high levels of assets have high debt-to-asset ratios. For example, the self-employed enterprises in the bottom 10% of the asset distribution have virtually no debt, while the debt-to-asset ratio of the firms in the top 10% is 0.24 (Table 5.19, column 5). The standard deviation is also higher for firms with higher returns. Perhaps this is because the self-employed with higher assets need to find alternative ways to fund their investments besides using their own savings.

Table 5.19 Financial performance of self-employed enterprises in rural China, grouped by size

	Hourly earnings		Return on asset		Debt-to-asset ratio	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Bottom 10%	3.9	8.1	10.8	40.8	0	0
Low middle	2.4	5.8	–0.03	3.1	0.13	0.4
High middle	8.8	38.1	0.19	0.62	0.23	0.4
Top 10%	31.7	87.8	0.26	0.26	0.24	0.5

CONCLUSIONS

In this paper, we provided a picture of the self-employment sector in rural China, especially focusing on the start-up, operation and financial performance of self-employed enterprises and the business environment within which they operate. Above all, this paper shows that there is a standard way that the self-employed initiate their businesses in rural China and a new class of 'self-employed with Chinese characteristics' appears to be emerging. Our paper shows that, although the self-employed

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firms, on average, employ fewer than three persons, self-employment in the aggregate contributes a significant share of national employment. Self-employed firms have also been growing rapidly in terms of their rate of capital accumulation. Finally, we show that the self-employed earn more than wage earners and that the self-employed firms in a number of senses have performed better than SOEs and TVEs. In sum, this paper provides evidence that, although the self-employed enterprises are small, they have grown rapidly, are in complex businesses and perform well financially.

There is one question about the self-employment sector we have not answered yet: is the expansion of self-employment a component of the healthy and dynamic development process of rural China or just a phenomenon occurring in poor areas? We have been observing firms in the aggregate, but it is possible that most of the expansion is in poor areas and that, as poor areas develop, the importance of self-employment will diminish. In other words, it is possible that self-employment is just a transient institution.

In order to understand in greater depth the nature of the self-employment sector, we also used our data to examine regional differences in self-employment. We find that the self-employment sector has been expanding rapidly in both the richer and poorer regions. In all areas, firms that use complex technologies and more capital are growing over time. In both richer and poorer areas, handicraft or custom labour providers are becoming less dominant. In addition, self-employment earnings are higher than wage earnings in both richer and poorer regions and the self-employed are relatively better educated and share similar human capital.

Given this result, we believe that the findings indicate three things. First, the expansion of self-employment in rural China is not unique to poorer regions. Second, in both the richer and poorer regions, the quality of the self-employment sector has been improving over time. Third, in both regions, self-employment activities are pursued by people with relatively high human capital who are attracted to the sector by profitable opportunities. Hence, we believe that the rise of self-employment in rural China is part of the dynamic development process, not a sign of economic failure. In contrast, Daniels (1999) finds that in Kenya the self-employed firms are in fact survival activities that reflect a lack of opportunities in the modern sector.

If self-employment in rural China is judged to be a source of growth of rural China and not a sign of economic distress, it deserves more attention and may be a source of continued output and employment growth. Policy makers should overcome their biases against self-employment. Instead, they should formulate supportive policies

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for the sector. Those policies that help small entrepreneurs gain access to credit and provide technological support would boost self-employment activities. In the meantime, development economists also need to rethink the role of self-employment in the development process and modify their own intellectual biases about self-employment, at least in the case of China.

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CHAPTER 6

RAISING PRODUCTIVITY ON THE FARM

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6.1 AGRICULTURAL RESEARCH, EXTENSION AND WATER MANAGEMENT TO RAISE FARM PRODUCTIVITY

CCICED ARD Task Force members

AGRICULTURAL RESEARCH

China has traditionally had a strong agricultural research system that has generated technologies adopted by millions of farmers to meet the increasing demand for food and fibre in the most-populous country in the world. Publicly funded agricultural research and a network of extension agents were the keys to the nation's performance. There is concern, however, that China is not currently investing enough in agricultural research. Agricultural research investment intensity (ARII—agricultural research expenditures divided by agricultural gross domestic product) declined from the mid 1980s to the late 1990s. Although increasing since 2000, total ARII is still only 0.5%, less than half of the minimum level of investment recommended by the United Nations. If we examine only government budgetary allocations for agricultural research (that is, if we exclude earnings of the commercial subsidiaries of China's research institutes), the percentage of budgetary ARII is 0.25%, only about one-tenth of the average for developed countries (2.37%) and about one-third of the average intensity for developing nations (0.65%).

At the same time, substantial changes are under way in the agricultural research system. Research institutes are overstaffed and burdened with the duty to care for retirees and house the staff. Recent changes in the funding mechanisms for

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research institutes have transferred responsibility for raising funds to the institutes themselves. While these changes have the potential to make some of the research institutes more efficient and more responsive to the demands of the market, not all agricultural research can or should be commercialised. With rising concern about research being needed to overcome problems in raising yields for conventional varieties (that is, for crops in which the private sector has no interest), poverty reduction and environmental sustainability, the government needs to remain actively involved in funding. Since the benefits from basic research rarely accrue to the party that is engaged in such research, commercial interests will never do the optimal amount of basic research. Most scholars believe the agricultural research system needs to be fundamentally reformed to be able to serve the nation as its modernisation proceeds.

EXTENSION

There is even more concern about China's extension system. The task force concludes that it is a great challenge for the agricultural extension system to provide new and appropriate technologies for 240 million small farm households. Unfortunately, during the 1990s, one of the largest and most-effective extension systems in the world nearly collapsed. According to a recent survey of the nation's 1 million extension staff, only a small fraction is engaged full-time in extension work. Many extension stations at the township level exist in name only. Extension agents often pursue agendas that are not in the interests of farmers.

While poor training and antiquated equipment and methods are problems, by far the greatest weakness is that the government's budgetary commitment to agricultural extension is inadequate. Since the late 1980s, many local extension stations have not been able to pay their technicians a full salary. Instead, upper-level officials encourage their field agents to shift part of their efforts to commercial activities in order to supplement their income. Extension agents are supposed to do business, such as selling pesticides, for part of their time and use the earnings to subsidise their extension work. They cannot effectively serve two masters, but even when agents are willing to perform their extension tasks they do not have access to any resources to do so. A recent survey shows that extension agents spend only a small fraction of their time, if any, doing extension work. More than three-quarters of local extension stations do not have any extension projects. Finally, there are many

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reported cases where extension agents are not promoting appropriate technologies, at least in part because of conflicts of interest between their commercial activities and their extension work. In some areas, extension agents tried to slow down Bt cotton adoption since it would reduce the demand for agricultural chemicals. Without reforming the extension system, it will remain an overstaffed bureaucracy with unqualified technicians who have little incentive to work on appropriate extension activities.

Despite the problems facing China's agricultural research and extension systems, it is more important than ever to build-up the institutions that can create and deliver new agricultural technologies. The country is still land-short and faces an emerging water crisis. The new pressures of urbanisation, changing preferences, rising wages and emerging markets will put a great deal of pressure on the research and extension system to create and deliver agricultural innovations that can raise agricultural profitability in the future.

FACING THE CHALLENGES OF WATER MANAGEMENT

Water shortages pose a serious barrier to growth. They are limiting efforts to alleviate poverty and are becoming a major source of environmental problems. So far, no option has proven very successful in combating the problem of increasing water shortages. Unfortunately, traditional policies either no longer work (e.g. investing in increasing the supply of water—most of the water in northern China is already being used) or do not lead to real water savings (e.g. the promotion of technologies such as sprinklers). Such strategies are unlikely to solve China's water shortages since they do not lead to real water savings. Even with south-to-north transfer, there will still not be enough water to solve the crisis. Since traditional engineering approaches are not feasible, there is a need to turn to more ambitious water policies. While complicated, we summarise here the steps that the government must take in order to begin to manage north China's water resources.

- *First*, water savings in irrigated agriculture need to focus on reducing the water consumed per unit of crop production. This requires an integrated approach of improvements in irrigation technology (including water-conveyance systems and drainage), agronomic practices, and farm-water management.

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- *Second*, water-management agencies need more authority to implement the difficult allocation measures that are needed.
- *Third*, to achieve true water savings while avoiding inequitable outcomes, a system of water rights for *both* surface and groundwater is needed, with rights extending to individuals who live in specific areas and the total amount of the rights limited to water availability after taking into account the environment and other needs.
- *Fourth*, after water rights are established, China needs to begin the investments and management shifts that will allow for volumetric pricing and regulation of water.
- *Finally*, with the institutions and facilities in place to implement a system of water rights and volumetric charges for water, the nation can begin to move toward improved water management.

The efforts on the conservation side must be matched on the pollution-abatement side in order to stop the mounting, and often irreversible, damage to China's water resources. Water scarcity is more critical when limited water resources become unusable because of water-quality deterioration. In sum, it is not going to be easy to make the fundamental shifts, but of all the areas of resource management, getting water policy right may be the most important.

MAJOR ISSUES

Reformers of China's agricultural research and extension system face three major issues:

Antiquated institutional setting

- Lack of coordination and unproductive duplication: China's agricultural research system is the most highly decentralised system in the world. Over 95% of research institutes and more than 85% of China's research staff are in provincial and prefecture institutes. There is little coordination between central and sub-national institutions. Without coordination, research programs in many parts of the country are duplicative. While competition among research centres is healthy, redundancy and duplication waste resources and lead to few new breakthroughs. Also, a gap has emerged between research and extension.

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- Overstaffing with unqualified personnel: China's R&D staffing levels are too high. Overstaffing plagues almost all institutes. Most institutes are burdened with many unqualified staff. There are more than 130,000 approved staff positions. Although many positions are unfilled, there are 70,000 active research personnel, a level that is three times that of the US and the former Soviet Union. There are more than 1 million extension workers. Only 10% of China's extension staff have BS degrees; only 0.1% have MS or PhD degrees. There are no systematic ongoing training programs for extension agents; the lack of ties between research institutes and agricultural universities makes continuous learning difficult.
- The drag of retirement: In addition to all other duties, the research and extension system must provide social welfare services for its retired staff. It is estimated that the ratio of working staff to retired staff increased from 4:1 in the 1980s to about 2:1 in the late 1990s. Because core funding has not increased as retirement costs have risen, an increasing share of the research and extension budget is being allocated to retirees.

Public and private partnership

- All public; no private: The creation and extension of China's agricultural technologies are overwhelmingly financed and undertaken by the public sector. While the public research system comprises over 1600 research institutes, there are no more than a handful of private agricultural research institutes. Also, investment in R&D is mostly from the public sector; less than 2% of research expenditures are by the private sector. In contrast, the role of the private sector is rising in many other nations. China's already overburdened public sector is taking on tasks that are privately funded elsewhere in the world. The presence of the government often suppresses private-sector activity.
- Need for bold reforms: Although China has been trying to reform its agricultural research and extension system, the results of reforms have been mixed. Few of the reforms have reached the goals of creating a modern and efficient agricultural technology sector. In the same way that the bold reforms in other parts of the research system outside of agriculture were executed and succeeded (e.g. those in the Chinese Academy of Sciences), wide-reaching commercialisation of selected institutes and the concentration of greater levels of funding on the best research teams are needed in agriculture. These changes will not be easy; and will not be painless. China must make them to modernise its R&D system.

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Financing

- More funding; improved R&D climate: While China has been increasing investment in agricultural research since the late 1990s, its investment is still low. Insufficient budgets are severely limiting the effectiveness of the agricultural research and extension system and reducing the incentive of staff.
- More funding; higher-quality research staff: insufficient funding is limiting the ability of China's agricultural research and extension system to attract quality staff. In today's world, the system must be able to compete for the best and most-creative minds.

POLICY RECOMMENDATIONS

Deepening agricultural research and extension reforms

- China's leaders should take steps to further reforms in agricultural R&D. High levels of future funding should be promised to those institutes and academies that take significant moves to upgrade their research capacity and eliminate marginal research staff.
- China may consider establishing a new series of regional agricultural academies of sciences by merging several provincial agricultural academies of sciences that are in the same eco-region. A similar approach can be applied to the merger of prefectural agricultural research institutes into larger ones. National level academies and institutes should be strengthened and there should be clear divisions of responsibilities between them and regional institutes. The national government must take far greater responsibility for funding and coordinating research at the new academies since coordination and joint-funding arrangements are difficult to arrange. Regional research projects funded by the central government, as is done in the US and Canada, are also needed.
- China needs to completely reform its agricultural extension system. It may even be worth creating an entirely new public extension system; the current system is so weak and ineffectual that reform may be impractical. The reformed system should draw no more than 20–30% of the most qualified extension technicians from the current system. New personnel with more training are needed. The

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new staff need to be well-supported with adequate salaries and program funds. They should not be allowed to engage in commercial activities. Ongoing training needs to be systematised.

- Modern and effective institutional arrangements should be established in the new agricultural research and extension system. For example, extension programs that are put out for competitive bid may help better match skills to extension needs. Competitive grants in the research program will improve incentives and guide the direction of research. However, not all funding can be by project. Basic salaries and program costs must be met from government budgets.

Create the environment for a better relationship between public and private sectors

- China needs to clearly delineate the roles to be played by the public and private sectors in agricultural research and extension. Public research and extension should concentrate on the provision of public goods; other activities should be spun off to the private sector. New and effective institutions are needed to facilitate public–private partnerships. For example, private seed companies should be encouraged.
- To increase the financing and effectiveness of applied research and extension, the government might consider industry groups such as the agricultural industry groups in Australia or the agricultural commodity organisations in the US and Canada. These organisations tax those who could benefit from research—for example, the beef industry—and, in return, the industry has a say in what research and extension are financed.
- The reforms should recognise also that not all agricultural research institutes and technologies can be commercialised. Research institutes should not be encouraged to go into business. Commercial businesses require competitive and efficient institutional and management systems. Rules and institutions that encourage public institutes to license and sell their technological products to the private sector are needed.

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Substantially increase investment in agricultural research and extension

- China needs to substantially increase its investment in agricultural research and extension. Commercialising part of its current agricultural research and extension systems does not imply a reduction in the government's role in financing agricultural research and extension. Agricultural research driven by commercial interests would naturally be directed towards the most commercially viable products and technologies. Once the market-driven research system starts to fund and execute research of certain commercial commodities and activities, the public research system can focus on activities that will lead to poverty reduction and environmental sustainability.
- The current needs for agricultural research and extension indicate that public funding from the central government should be the primary source of agricultural research and extension in the decade ahead, with continuing aid from provincial and prefecture governments. Difficulties in implementing and enforcing a strong intellectual property rights (IPR) system also imply the importance of the government's continuing support for agricultural research and extension.
- We recommend that public agricultural research investment should be increased from the current level of less than 0.3% to at least 1% of total agricultural GDP. Although China will still be far behind other countries, it is a goal that is attainable in the short term. Similar levels of public investment in agricultural extension are needed.
- Remove restrictions on foreign investment in R&D in biotechnology and the seed industry.

Improving the environment for intellectual property rights enforcement

- If the private sector is to play a larger role in conducting and financing agricultural research, IPRs on inventions in the private sector must be strengthened. The main problem of IPRs in China has been enforcement of trademarks, patents, and plant-variety protection rather than the laws themselves. The trademark,

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patent, and plant-variety protection laws are similar to laws in developed and more-advanced developing countries. One limitation of the laws is that some crops—such as cotton—are still not covered by plant-variety protection.

- Reduce government subsidies to provincial, prefecture and county seed and input companies so that the subsidies support the provision of public goods.
- Ensure that regulations on technology, quality, environmental safety, and food safety are science-based and are enforced by officials who are adequately paid by the government and do not earn money from the regulated industries. For example, seed-quality regulations are handled by government seed stations that are also in the seed business.

Improving water management

- Implement several policies:
  - Raise water prices (although higher prices may need to be matched by increased investment).
  - Promote new, water-saving technologies (ones that will lead to true water savings, such as reduced-irrigation cultivation practices for wheat). Increases in investment in research and development on water-saving technologies are needed; as are investments in new extension efforts and training.
  - Reform management institutions in order to achieve cropping intensity levels and cropping patterns, as well as municipal and industrial use levels that will be sustainable.

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6.2 CHINA'S AGRICULTURAL RESEARCH AND DEVELOPMENT:

REFORMS AND CHALLENGES

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INTRODUCTION

The rapid and steady increase in output of major food and agricultural products in China ranks as one of the nation's great achievements. Publicly funded agricultural research has had a key role in this impressive performance (Huang et al. 2003). Expenditures grew rapidly from the early 1960s to the mid 1980s and the number of agricultural researchers increased throughout (Fan and Pardey 1992).

The rising research investment resulted in a steady stream of productivity-increasing technology. China was the first nation to extend semi-dwarf rice varieties and drought and pest-resistant wheat cultivars in the 1950s (Stone 1988). Its scientists also developed hybrid rice in the early 1970s and a number of successful varieties in the 1970s and 1980s. Several studies conducted by the Chinese Academy of Agricultural Sciences (CAAS) show that technology contributed more than 40% of agricultural growth (Zhu 1997). Recent studies on agricultural total factor productivity (TFP) further confirm that agricultural-productivity growth has come mainly from technology changes,

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including the expansion of high-yielding varieties (HYVs), other embodied input technology and improvement in farming systems (Fan and Pardey 1997; Huang et al. 2000; Jin et al. 2002). The major output of agricultural research—improved varieties and farming system management—has come from national, provincial and prefectural institutes as well as from agricultural universities (Huang et al. 2003).

There is concern, however, that the research system might have been weakened after the late 1980s. The overall funding for agricultural research stagnated during 1985–1995 (Huang and Hu 2000). Long lag times between agricultural research expenditures and benefits mean that adverse effects of shortfalls in expenditures will not become evident until 5–10 years later, which may partially explain the lower growth rates of crop, particularly grain, yields in recent years.

On the other hand, the future demands on agricultural research in China will be sizable. The country has less than 10% of the world's arable land and 25% of world per-capita water availability, but already feeds more than 20% of the world's population. To keep pace with increased demands from projected population increases, food production in China will have to increase continually (Huang et al. 1999; World Bank 1997). Given the limitations on arable land, productivity increases will have to be the primary source of increases in output (Nyberg and Rozelle 1999).

In order to maintain a high food-self-sufficiency level, policy makers tried to raise funding for agricultural research, shifted funding from institutional support to competitive grants and moved more funds from basic research to research aimed at solving problems of economic development, and encouraged research institutes to be self-sufficient by selling their technology (Rozelle et al. 1997). However, several questions are raised. Can China's public agricultural research financing maintain a strong agricultural R&D system? How can China manage commercialisation of its agricultural research? What is the role of the private sector in generating and providing agricultural technologies for farmers? What kinds of reforms are necessary to improve the efficiency of agricultural research?

Answers to these questions are critical to policy makers, producers and agricultural industry in China. This study is designed to gain a better understanding of the questions above. The paper is organised as follows. In the next section, the existing structure of the agricultural research system is reviewed. The third section examines the trends and structure of agricultural research financing and revenues. The current reforms and policies are discussed in the fourth section. The final section draws conclusions and makes policy recommendations.

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AGRICULTURAL RESEARCH INSTITUTIONS

An overview

A public-sector dominated research system

Agricultural research in China is overwhelmingly financed and undertaken by the public sector; private-commercial agricultural research is minor. The public research system comprised over 1600 research institutes and more than 130,000 staff in 1999 (Table 6.1), plus about 55,000 retirees who are dependent on research institute budgets for their pensions. Public agricultural research is conducted in the agricultural research institutes (mainstream agricultural research system, MARS), universities and non-agricultural research institutes. Among all staff, MARS accounted for 83% in 1999, and the rest is about equally distributed between the universities and the research systems under other ministries. It is estimated that the number of research staff from the private sector engaged in agricultural research is no more than 500 (Pray 1998). Research expenditure of the private sector is only about 1.7% of the nation's total agricultural research budget.

Table 6.1 The numbers of institutes and staff in public agricultural research in China in 1999

	Total	University[a]	Others[b]	Mainstream agricultural research system (MARS)			
				Sub-total	National	Provincial	Prefecture
Number of institutes	1,635	312	104	1,219	56	451	712
Number of total staff	131,439	10,200	12,457	108,782	10,706	51,609	46,467
Staff per institute	80	33	120	89	191	114	65
Staff shares (%)	100	8	9	83 (100)[c]	8 (10)	39 (47)	35 (43)

[a] Under universities, agricultural research staff are those professors or lecturers who have research projects in agriculture-related fields, whereas staff numbers in other columns are the total staff, including all professional, support and other staff working in and supported by the institutes.

[b] Others include those under other than MARS and universities (i.e. Chinese Academy of Sciences).

[c] The numbers in parentheses are the staff shares (%) within MARS.

Source: authors' survey and database from the Ministry of Science and Technology.

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A highly decentralised research system

Some 95% of the research centres and more than 85% of research staff are found at sub-national levels. Provincial and prefectural agricultural research institutes number 451 and 712, respectively (Table 6.1). Within MARS, the national level research institutes accounted for only 10% (or 8% of China's total staff) in 1999. Each province has its own provincial academy of agricultural sciences, at least one agricultural university and several other agriculturally related colleges at provincial and prefectural levels. Most prefectures have their own agricultural research institute. All core budgets of research institutes at provincial and prefectural levels are from the corresponding local governments. The research projects conducted at the provincial and prefectural institutes are financed mainly by local governments. In terms of budget allocation, national level institutes within MARS account for only 12% of China's agricultural research budget (Table 6.2). Provincial and prefectural institutes account for 51% and 34%, respectively (Table 6.2). As the size of institutes measured by staff numbers differs among the institutes at various levels, the budget per staff at the national research institutes (77,000 yuan/staff, Table 6.2) is much higher than those at the provincial (54,000 yuan/staff) and prefecture levels (40,000 yuan/staff).

Table 6.2 Total revenue of public agricultural research in China in 1999

	Total	University	Others[a]	Mainstream agricultural research system (MARS)			
				Sub-total	National	Provincial	Prefectural
Total revenue (million yuan)	6846	478	889	5479	827	2772	1880
Revenue per institute ('000 yuan)	4187	1532	8548	4495	14,768	6146	2640
Revenue per staff ('000 yuan)	52	47	71	50	77	54	40
Revenue shares (%)	100	7	13	80 (100)[b]	12 (15)	40 (51)	27 (34)

[a] Others include agricultural research institutes under other than MARS and universities (i.e. Chinese Academy of Sciences).

[b] The numbers in parentheses are the revenue shares (%) within MARS.

Source: authors' survey and database from the Ministry of Science and Technology.

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A research-institute dominated system

Agricultural research in China is primarily built around the research institutes of the Chinese Academy of Agriculture Sciences (CAAS),[1] a series of provincial and prefecture academies, and to a lesser extent, the agricultural university research system. Researchers in the universities account for only 8% of the total agricultural research staff and 7% of budget share (Table 6.2). Over-staffing in agricultural research institutes and an under-funded agricultural research system may partially explain under-use of human resources in universities.

A crop-oriented research system

Food security has been one of the central goals of China's national policy since the 1950s. The priority of research programs has been in basic, staple foodstuffs, particularly grains in the 1960s–1970s. Rising incomes have resulted in changes in diet and increasing demand for non-staple foods since the 1980s. Concomitant with these changes, the structure of agriculture has also been gradually moving to non-staple crops, livestock and other agricultural products. However, even with these changes in agricultural production structure, based on our surveys of over 1200 agricultural research institutes under MARS, about 68% of the research budget was allocated to crops, 18% for livestock and 14% for all others (Huang et al. 2003). These proportions have been nearly constant over the past two decades. Since a large part of the income of the poor is from crop production, in this consideration, the crop-oriented public research system ('pro-poor' system) contributes to both food security and poverty-alleviation objectives.

[1] There are five major agricultural academies at national level. They are CAAS, Chinese Academy of Fishery (CAFi), and South China's Academy of Tropical Plants (CATP) under the MOA, Chinese Academy of Forestry (CAFo) under State Forest Bureau, and Chinese Academy of Agricultural Mechanization (CAAM) under both State Machinery Bureau and the MOA. However, CAAS is the largest in terms of staff and budget. In this paper, our discussions will focus mainly on CAAS, but policies and issues raised here are equally applicable to the rest of the national agricultural research system.

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Challenges

Lack of coordination

A decentralised research system has potential merits as it could easily prioritise research programs to meet local farmers' needs and develop appropriate technologies for locally specific environments. However, there are also several disadvantages associated with this system. Limited coordination among institutes can lead to duplication of research between regions, which may lower overall efficiency of research investment for the country as a whole. When the constraints of agricultural research finance are considered, as evidenced in many less-developed areas in China, the decentralised system could have significant implications for agricultural technology changes and farmers' income growth in the poor areas. Inefficient resource allocation could easily be created from management conflicts and similarity of the research priority settings between the central and local governments, among various ministries (at central government) or bureaus (at local government) at the same jurisdiction, and among local research institutes in similar regions.

Over-staffing

Large numbers of unqualified researchers and lack of research funding are quandaries that China's agricultural research system is facing. Among 130,000 staff, about 70,000 are claimed to be 'active research' staff. In the absence of a national pension system, China's agricultural research system also supports more than 55,000 retirees through the institutes' budgets. The number of active research staff is three times that of the USA and the former Soviet Union (Table 6.3). It is worth noting that this comparison is not to measure research capacity, but rather to point out one of the fundamental problems in China's research system: over-staffing and a large number of unqualified researchers. Considering the size of the country's agriculture, Table 6.3 also shows that China's number of agricultural researchers per million US dollars of agricultural GDP is higher than all the other countries except the former East Germany. Such a resource distribution pattern reflects the features of a socialist economy, where the strategy in resource allocation is to replace scarce capital by human resources with suppressed salaries. With the transition from a planned to a more market-oriented economy, the salary levels lag far behind the expectations of agricultural researchers. Consequently, agricultural researchers started to move to other sectors and their number has declined recently.

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Table 6.3 International comparisons on numbers of agricultural scientists

	Number of active researchers				Number of agricultural researchers per million US dollars of agricultural GDP
	Public agricultural research institutes	Universities	Private sector	Total number	
China (1999)	59,058	10,200	500	69,758	0.40 (0.69)[a]
India (1987)	4,052	5,800	600	10,452	0.16
Brazil (1995)	2,097	965	266	3,328	0.05
Argentina (1995)	1,051	61	110	1,222	0.07
Columbia (1995)	524	17	318	859	0.08
Mexico (1995)	1,365	464	901	2,370	0.14
Chile (1995)	189	50	13	252	0.05
USSR (1991)	23,144	0	0	23,144	0.46
East Germany (1989)	6,200	1,350	0	7,550	0.72
East Germany (1995)					(0.12)
West Germany (1989)	1,300	2,410	404	4,114	0.16
West Germany (1995)					(0.15)
Japan (1986)	11,154	3,605	8,850	23,609	0.13
USA (1991)	3,687	7,525	14,188	25,400	0.14

[a] Refers to total staff, rather than active research staff (0.40).

Sources: Pray and Umali (1998); Huang et al. (2003); and authors' survey.

Retirees

The research institutes have a large proportion of retired staff. It is estimated that the ratio of working staff to retired staff has changed from 4:1 in the early 1980s to about 2:1 in 1999. For 1219 agricultural research institutes under MARS, the retirees were 49% of the existing staff. Because core funding from the government has not been raised as much as the requirements for salary and pension systems, an increasing portion of research institute budgets is allocated to payments for retired staff. For example, in CAAS, on average 20% of the academy's budget or 32% of the academy core funding is spent on about 4600 retirees (58% of working staff). In several research institutes, such as the Institute of Crop Breeding and Cultivation and the Institute of Vegetable Crops and Flowers, payments for retirees account for almost all of the institutes' core funding.

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AGRICULTURAL RESEARCH FINANCING

Agricultural research financing has undergone fundamental changes since 1989. Before the research reforms initiated in the mid 1980s, the government provided all of the funding for research. Planners allocated most funds through five-year plans with supplementary funding for special issues arising during the planning period. The former State Science and Technology Commission (SSTC) and, since 1998, the Ministry of Science and Technology (MOST), together with the Ministry of Agriculture and other ministries, wrote the research component of the plans with the assistance of special committees made up primarily of senior scientists from the various disciplines. Most of the funds were then allocated on a formula basis to the research institutes mostly at the national level. A similar funding mechanism was followed at provincial and prefectural levels. The formula-based financing has been gradually shifted to competitive grants. Lack of funding to maintain operations has pushed agricultural research institutes to generate their revenue from commercial activities that accounted for 41% of the total budget in 1999 (Huang et al. 2003).[2] By the late 1990s, the government fiscal budget accounted for only about 50% of the total budget of the institutes (Table 6.4).

Agricultural research investment: amounts and trends

China's agricultural research system expanded in most periods over the past five decades. The rapid growth of the agricultural research system has benefited from unremitting commitment by the government to agricultural research. Expenditure for agricultural research in real terms grew by 13.5% annually between 1976 and 1985 (Huang et al. 1999). Between the mid 1980s and mid 1990s, however, the government fiscal investment in agricultural research did not increase and even declined in many years (Table 6.4). This raised concerns about China's future ability to meet the growing demand for agricultural products resulting from rapid growth of the economy. Realising the slow growth, and even decline, in agricultural research expenditure, China increased public investment in agricultural research after the mid 1990s.

[2] Our surveys show that there is only about 5–15% of commercial income invested in research projects, the rest going to salaries and bonuses for employees, mostly those working on commercial activities.

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Slow growth of total agricultural research investment

Total investment (including government fiscal expenditure and research institutes' commercial income) in agricultural research[3] grew from 1355 million yuan in 1985 to 6368 million yuan (current prices) in 1999, representing a more than four-fold increase (Table 6.4). However, measured at the real value (deflated by the general price index), the annual growth rate was only 3.6% over 1985–1995 or 4.0% over 1985–99, below the growth rate of agricultural GDP (more than 4%) in the corresponding period.

Table 6.4 China's agricultural research investment in the public research system, 1985–1999

Year	At current prices (million yuan)			At 1998 prices (million yuan)		
	Total	Fiscal	Commercial	Total	Fiscal	Commercial
1985	1355	1015	203	3923	2939	588
1986	1346	958	200	3676	2617	546
1987	1403	948	269	3572	2413	685
1988	1782	1189	366	3827	2554	786
1989	2095	1400	402	3820	2553	733
1990	2050	1243	499	3661	2220	891
1991	2381	1283	655	4133	2227	1137
1992	2761	1442	840	4548	2375	1384
1993	3273	1558	1077	4763	2267	1567
1994	4409	2072	1322	5272	2478	1581
1995	4856	2441	1541	5058	2543	1605
1996	5238	2754	1580	5143	2704	1551
1997	5377	2789	1588	5237	2717	1547
1998	5847	3060	1687	5847	3060	1687
1999	6368	3358	1810	6565	3462	1866
Annual growth rate (%)						
1985–95	13.3	8.4	21.8	3.6	–1.3	12.1
1996–99	6.5	7.4	3.9	6.5	7.4	3.9
1985–99	12.5	9.6	17.6	4.0	1.1	9.1

Source: Ministry of Science and Technology.

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Government investment re-started growth after the mid 1990s

Among total agricultural research institute revenues, Table 6.4 shows that the government fiscal expenditure for agricultural research in real terms declined in 1985–1995; annual growth rate was negative (–1.3%). It re-started growth at a rate of 7.4% annually in 1996–1999 (Table 6.4). Our recent interviews with officials from the Ministry of Finance revealed that the annual growth rate of agricultural research expenditure has exceeded 10% in 2000–2003.

Rising commercial income with declining growth rate

Non-government fiscal investment, or income generated by research institutes from commercial activities, was a major component of research institutes' revenue in 1985–93, but experienced slower growth after 1993 (Table 6.4). The annual growth rate reached 12.1% in 1985–95, but declined to 3.9% in 1996–99.

Intensity of agricultural research investment

Internationally, investment intensity (that is, the percentage of agricultural research investment relative to agricultural GDP) is usually used to measure the level of investment in agricultural research. Table 6.5 shows that investment intensity in China's agricultural research declined during the period of 1985–1996 and resumed growth only recently.

Based on government budgetary allocations for agricultural research (excluding income generated by research institutes through commercial activities), the percentage fell from 0.40% in 1985 to 0.20–0.23% in the late 1990s. If the income generated by research institutes and the investment in agricultural research by foreign companies and private enterprises are included, the intensity of investment in agricultural research reached 0.44% in 1999 (Table 6.5). This is still one of the lowest in the world (Table 6.6).

Investment in agricultural biotechnology research

China considers use of agricultural biotechnology to be one of the primary measures to improve its national food security, raise agricultural productivity and give it a competitive position in international agricultural markets. In order to achieve these goals, China has made great efforts to improve its innovation capacity in national

[3] Including agriculture, forestry, animal husbandry, water conservancy, and agricultural services.

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biotechnology programs since the early 1980s. In contrast to the stagnating, or even declining, trends in public agricultural research staffing and expenditure in 1985–95, the number of plant-biotechnology researchers more than tripled in the past two decades.[4] We estimate that there were about 2700 researchers (including support staff) dedicated to plant biotechnology in 2003 (Table 6.7). If we include the animal sector, the number of agricultural biotechnology researchers may be more than 4000, which probably is one of the largest in the world.

Table 6.5 Intensity (%) of investment in agricultural research and technical extension services in China, 1985–99.

Year	Agricultural research			Agricultural technical extension
	Government fiscal expenditure	Commercial income and others	Total	
1985	0.40	0.13	0.53	n.a.
1986	0.35	0.14	0.49	0.41
1987	0.30	0.14	0.44	0.40
1988	0.31	0.15	0.47	0.37
1989	0.33	0.16	0.50	0.36
1990	0.25	0.16	0.41	0.33
1991	0.24	0.21	0.45	0.34
1992	0.25	0.23	0.48	0.34
1993	0.23	0.25	0.48	0.32
1994	0.22	0.25	0.47	0.30
1995	0.20	0.20	0.40	0.27
1996	0.20	0.18	0.38	0.29
1997	0.20	0.18	0.38	0.31
1998	0.21	0.19	0.40	0.42
1999	0.23	0.21	0.44	0.46

Sources: Ministry of Finance, and Agricultural Policy Research Center of the Chinese Academy of Agricultural Sciences.

[4] This is based on our survey of 29 research institutes in the plant biotechnology area in 2000, interviews with the ministries and research institutes in 2002, and our most recent research institute survey in 2004.

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Table 6.6 Intensity of agricultural research investment in the mid 1990s

Region	Investment intensity (%)			Share (%)	
	Government	Non-government	Total	Government	Non-government
China (1999)	0.23	0.01+0.21[a] =0.22	0.45	51.1	48.9
Taiwan	4.65	n.a.	n.a.	n.a.	n.a.
Other Asian countries					
India	0.37	0.06	0.43	86.0	14.0
Malaysia	0.58	0.15	0.73	79.5	20.5
Thailand	0.69	0.10	0.79	87.3	12.7
Indonesia	0.24	0.02	0.25	96.8	7.2
Pakistan	0.47	0.02	0.49	95.9	4.1
Latin America					
Argentina	0.82	0.05	0.88	94.3	5.7
Brazil	0.83	0.12	0.95	87.4	12.6
Chile	0.64	0.05	0.69	92.8	7.2
Columbia	0.26	0.15	0.41	63.4	33.6
Mexico	0.36	0.28	0.64	56.3	43.7
Peru	0.76	0.14	0.91	83.5	16.5
Venezuela	0.82	0.08	0.90	91.1	8.9
Developed countries					
Japan	2.1	2.22	4.32	48.6	51.4
Australia	3.54	1.54	5.08	69.7	30.3
UK	2.29	3.80	6.09	37.8	62.2
France	2.24	2.52	4.76	47.1	52.9
Germany	1.88	2.66	4.54	41.4	58.6
US	2.02	2.34	4.36	46.3	53.7
16 high-income countries[b]	2.37	1.86	4.23	56	44

[a] The figures are for private (0.01) and income generated from development activities (0.21) by research institutes.

b. The figures for 16 high-income countries are the figures of late 1980s.

Sources: Pray and Umali (1998); S. Rozelle, Jikin Huang and C. Pray, unpublished data.

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Table 6.7 Estimated research staff and annual expenditure on plant biotechnology research in China, 1986–2003

Year	Staff	Research expenditure		
		Million RMB at current price	Million RMB at 2000 price	Million US$
1986	740	14	38	4.2
1990	1067	40	68	8.3
1995	1447	88	87	10.5
2000	2128	322	322	38.9
2003	2690	462	463	55.9

Note: expenditures include both project grants and costs related to equipment and buildings.

Source: Huang et al. (2004).

The growth in research investment in agricultural biotechnology in the public sector has been substantial. The estimated investment in plant-biotechnology research was only US$4.2 million in 1986 (Table 6.7) when China formally started its '863 Plan'. The investment grew to US$8.3 million in 1990, US$10.5 million in 1995, and US$38.9 million in 2000, the increase over 1995–2000 representing an annual growth rate of about 30%. The investment in plant-biotechnology research continued to grow in the first few years of the 21st century, reaching US$55.9 million in 2003, about 44% higher than that in 2000 (Table 6.7). Nearly all investment in biotechnology in China is from government sources (Huang et al. 2002).

Bt cotton is one of the most-often cited examples of the progress of agricultural biotechnology in China. In addition, other transgenic plants with resistance to insects, disease or herbicides, or plants with improved quality, have been approved for field release and some of them are nearly ready for commercialisation. These include: transgenic cotton lines resistant to fungal disease; rice resistant to rice-stem borer or bacterial blight, diseases and herbicide; wheat resistant to barley-yellow-dwarf virus; maize resistant to insects and with improved quality; poplar trees resistant to gypsy moth; soybeans resistant to herbicides; transgenic potato resistant to bacterial diseases or Colorado beetle (Huang et al. 2004). From 1997–2003, the National Agricultural Bio-safety Committee received a total of 1044 applications for field trials, environmental release, pre-production, and commercialisation of genetically modified organisms (GMOs), of which 821 were GM plants. Of these, 777 (585

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plants) were approved. Eighteen transgenic cotton varieties generated by Chinese institutions and five varieties from Monsanto with resistance to bollworm were approved for commercialisation in China in 1997–2002. While several GM varieties of tomato, sweet pepper, chilli pepper and petunia have also been approved for commercialisation since 1997, the areas under these four crops are very small.

Challenges ahead

While there has been increasing investment in agricultural research since the mid 1990s, China's agricultural research is still much under-invested. Insufficient research budget could severely affect the stability of the agricultural research system and the enthusiasm of researchers. Based on our interviews, the time spent on research activities by agricultural researchers dropped from 74% in 1985 to about 50% in the late 1990s.

Improvement of research capacity is another challenge that China's agricultural research is facing. For the country as a whole, for every 100 agricultural research workers in 1999, there were only 0.57 researchers with a PhD (Table 6.8). The percentage of researchers with PhDs differs widely between research institutes. It was 2.84% in national research institutes and 0.58% in provincial research institutes. Although prefectural research institutes employed more than 46,000 staff, only 12 researchers held PhD degrees (0.03% of total staff) in 1999. A similar pattern was evident for researchers with Masters degrees (Table 6.8).

The challenge is also raised for the less-developed regions under China's highly decentralised research system. While the decentralised system has its own merits, it may also present some disadvantages for agricultural productivity growth, food security and poverty alleviation in the poor areas, as local ability to invest in agricultural research depends on local income and financial capacity. Table 6.9 presents agricultural research investment intensities (ARII) by region, and shows that there is a negative correlation between ARII and economic development or income.

Western China is the least developed region with average per-capita income of 1502 yuan in 1999 (Table 6.10). Nearly half of China's rural poverty population is located in the region. Western China's poverty incidence (7.3%) was nearly six times as high as that in eastern China (1.3%, Table 6.10). However, it had the lowest value of ARII (0.26%), followed by central (0.30%) and eastern (0.36%) China (Table 6.10). The difference in ARIIs between western and eastern China is even larger when we include investment in national institutes located in the regions (Table 6.10).

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Table 6.8 Agricultural research staff by education and position for national and local research institutes under the mainstream agricultural research system in China in 1999

Total	Total staff	PhD	Masters degree	Bachelors degree	Professor + associate professor	Senior research assistant
Total	108,782	615	2,871	22,323	11,816	19,747
National	10,706	304	754	2,805	1,763	2,244
Provincial	51,609	299	1,836	11,374	6,572	9,426
Prefectural	46,467	12	281	8,144	3,481	8,077
As percentage of total staff (%)						
Total		0.57	2.6	21	11	18
National		2.84	7.0	26	16	21
Provincial		0.58	3.6	22	13	18
Prefectural		0.03	0.6	18	7	17

Source: Ministry of Science and Technology.

NATIONAL STRATEGY TO REFORM THE AGRICULTURAL RESEARCH SYSTEM

The reforms in the agricultural research sector vividly illustrate the propensity of the leadership to implement deep reforms in the most tradition-bound sectors (Maddox and Swinbanks 1995; Rozelle et al. 1997). As part of China's general move to distance itself from the rigid, closed planning system, reformers gradually implemented a series of science and technology policies that were designed to fundamentally alter the behaviour and output of research institutes. In addition to opening to the outside world, the agricultural research reforms of the 1980s and 1990s targeted two main areas: changes in the basis of the distribution of research funds to a more-competitive system, focusing resources on the most productive scholars and institutes; and policies encouraging research institutes to commercialise the products of their research, allowing them to retain profits and re-invest as a major source of revenue for their research work. Since the late 1990s, a new reform aimed at modernising the agricultural research system has been initiated.

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Table 6.9 Regional agricultural research investment intensity (%) under the mainstream agricultural research system in China in 1999

Region	Excluding national institutes in the region	Including national institutes in the region
Total or average	0.32	0.37
Southwest	0.20	0.21
North	0.26	0.35
East	0.29	0.33
Central	0.34	0.35
Northwest	0.39	0.51
South	0.41	0.46
Northeast	0.49	0.56
Western	0.26	0.30
Central	0.30	0.33
Eastern	0.36	0.43

Note: Eastern China includes Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi, and Hainan; Central China includes Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Hunan, Hubei, and Henan; Western China includes Sichuan, Chongqing, Yunnan, Guizhou, Tibet, Shaanxi, Gansu, Ningxia, Qinghai and Xingjiang.

Table 6.10 Regional income and poverty in rural China, 1999

	Average per-capita income (yuan)	Population under poverty (million)	Percentage of poverty in nation's total (%)	Poverty incidence (%)
Western	1502	16.44	48	7.3
Central	2003	12.67	37	3.9
Eastern	2929	5.01	15	1.3
China	2210	34.12	100	3.7

Sources: MOA (2000); NSBC (2000).

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Reforms before 1999

Competitive grants and focused research programs

Beginning in the early 1980s, national research policy gradually increased the proportion of funding allocated competitively, by encouraging funding agencies to make grants and fellowships to researchers putting forth the best proposals. Before that time, directors of research institutes and their department heads allocated the fund provided by the State Science and Technology Commission (SSTC) to projects, laboratories and individual scientists. Currently, most research funds from national sources can be accessed only through competitive research-funding programs. National leaders also competitively allocate funds for priority research areas, such as biotechnology, through programs like the 863 Program and the Special Foundation for Transgenic Plants. Most of the national and provincial Science and Technology Committees have expert committees made up primarily of scientists who rate proposals on the basis of the expected contribution to farmers, the proposed methodology, originality etc.

While the gradual trend towards competitive grants dominated the funding of agricultural research projects in the 1990s, all institutes still get 'administrative fees' (*shiyefei* or core funding) on a formula (non-competitive) basis from the Ministry of Agriculture (MOA) or their local budgetary authorities for base salaries, pensions and other operating costs. For the most part, administrative fees are used for the research staff's basic salaries and funds for benefits, such as housing subsidies and medical payment. One of the biggest uses of administrative fees has been for supporting retired personnel. Frequently, when administrative funding from a unit is insufficient to support its welfare needs, an institute's director will divert research grants by raising overhead rates or allowing project members to have the right to withdraw a portion of grants (normally in the range 5–15%) as a 'bonus' for their project staff to meet the fiscal needs.

Shifting research grants from a formula base to a more-competitive base is expected to have significant impacts on research productivity and prioritised areas that government intends to focus on. The research productivity may increase with the reform, as larger research budgets can be allocated to more-productive research institutes and individual scientists. Government objectives in areas of social and environmental concern such as food security, poverty alleviation and environmental protection can also be incorporated into competitive research programs.

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Commercialisation reforms

Policy makers began encouraging research institutes to earn their own income through commercial activities in the mid 1980s. In 1987, the SSTC chairman announced a plan to push scientists to think like entrepreneurs. MOA officials soon copied the SSTC moves, encouraging agricultural research institutes to earn money (Liu 1991). Researchers in our interviews recall that they initially gave little credence to the new directive, since seed prices were heavily subsidised and there was little prospect of making a commercially viable product except for seed.

As budgets became increasingly tight and the need to reform grew, the nature of commercialisation evolved. Reformers originally had designed the policy changes as a way to encourage institutes to capitalise on breakthroughs in research. It soon became an accepted practice, however, to make money in any way possible. Income generated by commercial activities increased rapidly in the late 1980s and early 1990s (Table 6.4). In the early reform period, commercial activities ranged from selling products produced by the institutes (e.g. plant-breeding institutes selling new plant varieties) to activities that were far from the unit's traditional discipline, such as running hotels and restaurants or selling industrial products. Recently, more income has been generated from technologies closely associated with the agency's area of expertise.

Unfortunately, weak IPR makes licensing technological breakthroughs with manufacturing enterprises or technology development firms not a credible option. Licences and technology contracts typically are not honoured for very long. For an economy with hundreds of millions of small farmers, the cost of enforcement or strict implementation of a strong IPR system, could be so high as to be not feasible. The way that a research establishment often partially capitalises on a breakthrough is to manufacture and distribute the product itself.

The impact of the reforms

Rozelle et al. (1997) found that China's agriculture reforms were only partially successful. Although the real income from commercial enterprises increased rapidly from 1985 to 1994, only a small amount of that income was used to fund research. The funds generated from commercial activities were insufficient to offset the reduction in government support for research. Moreover, the growth of income generated from commercial activities slowed after the early 1990s.

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On the other hand, while competitive grant funds may have focused resources on the better scientists, funding for agricultural-research projects in real terms did not increase for all types of research institutes. Since staff members in commercial enterprises did not move off the rolls, funds per scientist did not go up as officials hoped.

While there are signs of an increase in technology transfer because of the commercialisation process, the change has not been significant. In fact, many of the commercial activities in the early reform period by public agricultural-research institutes had little relationship to the technology they are responsible for developing. Intellectual property rights and contractual law in China apparently are too weak for technology to be profitably and successfully licensed. For a variety of reasons, then, by the late 1990s, the common perception was that the reforms, though perhaps successful in beginning to change the structure of China's research institutes, had only partially reached the goals or targets reformers had set.

A new push for reform

Strategy and plan

Lack of impact of the earlier reforms in terms of their provision of new technologies to producers, and failure to reduce over-staffing and duplication of research among institutes, have created a new impetus to launch another round of research reforms. In addition, the new needs created by China's move to a more market-oriented economy and the challenges of research in the new, high-technology fields reinforce the need to reform the agricultural research system. In this new round, the challenge that officials have set themselves is very high: to create a modern, responsive, internationally competitive and fiscally sustainable agricultural-research system (State Council 2000). The goals to better commercialise its products and increase funding per scientist are seen as necessary for keeping the best people engaged in agricultural research.

To meet the above goals, government policy to modernise the agricultural-research system contains several measures. The reforms attempt to separate the types of activities that are being performed by the current research staff into those that can be commercialised (most are applied research) and those that should be maintained in the public 'research innovation base' (most are applied-basic and basic research as well as research of a public-goods nature). For that left in the non-commercial sector, an effort then is made to separate the outstanding research staff and those with potential from those without the same potential. Those who are identified as the high-quality scientists have received higher salaries and large increases in per-capita support.

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Based on the above principles, in the late 1990s, MOST officials sketched a '1/3–1/3–1/3 plan' for agricultural-research reform. Reformers believe that, through fully commercialising some agricultural research institutes and commercialising some specific research programs or activities in each research institute, one-third of institute staff could be separated from the research system. During the transition phase of reforms for those institutes or programs/activities to be commercialised, the core funding would be gradually reduced, until the revenues of the institute-cum-enterprises become fully dependent on sales. Institutes and programs that to some extent also provide public goods (named as non-profit public institutes that are also believed to account for about one-third of total staff), receive public funding to cover part of their expenses. The rest of the agricultural research system is maintained, and placed into an innovation base and is to be given an increase in both core funding (particularly the researchers' salaries) and research budgets.

In the end, China's research reformers want to have a modern, state-of-the-art, internationally competitive, agricultural-research system. With such high competition, they will be able to attract better scientists. Higher levels of funding for the better researchers will keep them from diverting their attention from research into other activities such as consulting or commercial activities. MOST predicted that another benefit of such a system (which would also give the research institute's director more discretion over salaries and hiring) would be that more scholars would be attracted back from overseas.

Challenges of recent reforms

Our recent study shows that institutes face several challenges during the reforms—even with considerable additional investment (Huang et al. 2003). First, support for the retired staff has been a serious problem. For example, on average in CAAS institutes, pension and medical payments to retirees took up 32% of the core funding in 1999. The average ratio of retired staff to currently active staff was 0.6:1 in 1999, ranging from 0:1 (in newer or growing research institutes such as the Biotechnology Research Institutes) to nearly 1 to 1 (in older research institutes such as cropping-oriented research institutes). In the traditional institutes, which have been around for many years and have an ageing staff and many retirees, more than half of core funding is allocated to pensions and health care. Active scientists in these research institutes rely mostly on project funding or consulting for their salaries.

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National research directors also pointed out that, without a firm commitment to increased funding, the national research system might not follow the path directed by MOST. Some institutes in the rich regions that initiated commercialisation reform in the late 1990s have gradually returned to the government for support. In the less-developed provinces, where local government financial revenue generation is weak and investment in agricultural research is not viable, leaders used research reform as a mechanism to cut the budget. Quickly, however, reformers in the less-developed provinces and even in the more-developed coastal provinces found that few agricultural-research institutes could succeed commercially. Those that struggled included institutes that were originally thought to be engaged in 'applied' research. The main question is whether or not these institutes can survive after they are commercialised under their current management in China's current institutional and legal system.

Management problems also often occur because academics are seldom good businessmen, and managers are rarely given any real authority to restructure the firm. According to our interviews, managers are almost always prohibited from laying-off workers. In the minds of institute managers, commercialised enterprises must continue to take care of their retirees and other employees, otherwise they will become the burden of the institute.

Another difficult problem is that the business environment in the agriculture sector is not conducive to earning profits. Poor intellectual property rights, fragmented technology markets (e.g. for seed) and other factors keep agricultural technologies from prospering. Low profit rates, high transaction costs for servicing small customers, and other costs of doing business limit the commercial potential of many firms.

Lessons and new policies

In facing the above problems and challenges of reform, leaders realised that, while the reforms are needed, increasing financial support is an essential condition for successful reform. Even with successful commercialisation, large increases in budgets are needed to fund the elite scientists at levels needed to modernise the research sector and attract the best minds in the country. Recently, commodities and technologies that have strong public-goods features and social implications have been strengthened within the public research system. Other commodities and technologies with high potential for private-sector entry have been commercialised gradually with support from the public sector.

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Policy makers have also recognised that although commercialisation of many of the institutes can succeed and contribute to budgetary savings, the process might take time. A longer period and more support are needed to allow for a redirection of effort and restructuring of the firm. Recently, options have been opened to allow managers in some institutes to lay off workers, provide a better incentive system for the enterprises, and begin to make money.

CONCLUDING REMARKS

China has been highly acclaimed for its ability to feed its growing population within the constraint of extremely limited natural resources. Over the last four decades, per-capita availability of food, household food security and nutrition have all improved significantly. Increased domestic production is almost solely responsible for increased per-capita food availability and significantly contributes to poverty alleviation and farmers' income.

China's past experience shows that technological change in the developing countries is the main engine of agricultural growth, farming income increase and poverty alleviation. Publicly funded agricultural research has played critical roles in generating the technologies needed by hundreds of millions of farmers. However, the success of research-led technology changes in the past does not imply that agricultural research will be necessary to effectively generate the farmers' demand for agricultural technology in the future. Many things are changing.

This paper shows how China has been trying to reform its over-burdened, public dominated and decentralised research system in order to establish a modern, responsive, efficient, and internationally competitive agricultural-research system. Our study shows that commercialising agricultural research does not imply weakening government's role in financing agricultural research. Agricultural research driven by commercial interests would naturally be directed towards the most commercially viable products and technologies. Market-driven research systems will leave research directed to food security, poverty alleviation and environmental sustainability under-funded. The roles of agricultural research imply that public funding should be its primary source of support in the decade to come. Difficulty in implementing and high cost of enforcing a strong IPR system also imply the importance of a viable public financial support system for agricultural research.

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There are a few other lessons and experiences that resulted from China's agricultural research investment and reforms. These include: the commercial component of research reforms may not be successful if other reforms (such as output, input and technology market reforms) do not occur in the rest of the economy; not all agricultural research institutes and technologies can be commercialised; the commercial businesses of research institutes require a market-oriented institutional and management system; human capacity of academics in financial and business management is far behind the need for successful enterprise development; and the importance of public and local research on biotechnology. The fact that Bt cotton was developed by government researchers in parallel with its development by international companies clearly made it more palatable to the government and ensured that there was informed support for the technology.

Funding through various non-government sources is expected to increase in the future. This requires thorough reform of the existing public agricultural-research system and implementation of other policies and reforms, particularly those related to relaxing the barriers for private participation in research and technology transfer. To increase the ability for income generation by commercialised research institutes and to attract private investment in agricultural research, reforms should be continued to liberalise agricultural input and output markets, more resources and efforts should be invested in implementation and enforcement of policies related to IPR and ownership, the barriers to market access for private participants in the research and technology sector should be reduced, and government should provide greater incubator funding to assist local firms in the initial stages of private development.

The research capacity and technology gaps between rich and poor regions, and their implications for income distribution, have not been given much attention in the current research system in China. Since most of the research budgets of local research institutes come from the corresponding local government's fiscal revenue, it is expected that an increasing technology gap between the rich and poor regions would be enlarged given the current decentralised research system with its lack of coordination with national and inter-regional institutes. In this situation, regional research-investment priority is not likely to be given much attention by policy makers.

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6.3 SOME CANADIAN EXPERIENCES IN STRENGTHENING AGRICULTURAL RESEARCH AND EXTENSION USING PUBLIC–PRIVATE PARTNERSHIPS

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The responsibility for providing agricultural research and development (R&D) and extension services in Canada has shifted from the public sector being completely responsible to a variety of models that involve the private sector. This has come about due to changes in government policies; a reduction in public funding for agricultural R&D; an increased need to bring knowledge from non-agricultural disciplines to solve more complex problems; and the emergence of a stronger private-sector R&D capacity. This paper will discuss three examples of partnerships used in conducting R&D and in transferring technology to the Canadian agriculture sector. Specifically, these are: the partnership of federal and provincial departments of agriculture (Alberta–Canada Research Agreement); the federal department of agriculture and the private sector (Agriculture and Agri-Food Canada Matching Investment Initiative); and a consortium of the federal government, provincial governments, universities, industries and research institutes focusing on genomics (Genome Canada).

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EVOLUTION OF MODELS

In the late 1940s a number of events changed the way agricultural R&D and technology-transfer programs would be conducted in Canada. Mechanisation became more commonly used on farms, Canadians expected, and could afford, a broader array of food products, prices fell relative to personal income and more technology was available and used in the production and processing of food. Also, new government funding tended to be allocated to health, social programs and the development of new sectors, rather than to agriculture. At that time, companies tended to import rather than develop the technologies they required. By the early 1970s it was clear that the public sector would not be able to fund all the R&D necessary for Canadian agriculture to take advantage of accelerated innovation, emerging production and quality issues, environmental concerns etc. By this time, the private sector was using classical extension techniques to assist in the marketing of pesticides, fertilisers and seed. Specifically, they demonstrated their products using farm-based trials and provided up-to-date information on new farming practices. The public sector began to redefine its role and examine new ways to share responsibilities.

Some of the first formal partnerships were borne out of financial necessity, others were created to strengthen research teams by adding new skills, while others involved the recipient of the technology co-funding its development and transfer. By the early 1980s, departments of agriculture in larger provinces were funding and conducting R&D in support of their changing agriculture sectors. This led farmers to demand more co-operation and co-ordination between the two levels. One outcome was the innovative Alberta–Canada Research Agreement.

The Province of Alberta had an aggressive funding program, 'Farming for the Future', but limited infrastructure. The federal department, on the other hand, had excess research facilities in Alberta but constrained budgets. This new agreement enabled a provincial department to transfer funds to federal facilities to conduct research on its behalf. This set the stage for jointly funded research. The principles were relatively simple: there would be agreed priorities; at selected federal research centres, Alberta would fund projects that were consistent with its innovation strategy; and there would be joint transfer of technology.

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There were, of course, difficulties. For example:

- legal and accounting processes had to be negotiated
- research centres had limited experience in meeting contractual obligations associated with research
- no mechanisms were in place to deal with the ownership and exploitation of intellectual property.

After these issues had been addressed, it became obvious that both levels of government were more effectively setting priorities and were serving mutual clients in a more-productive and timely manner. Much of this was due to the inclusion of producers and processors on project selection boards. The agreement remains active and continues to provide valuable technology to agriculture in Alberta *and* in western Canada.

By the mid 1990s, the private sector was developing and transferring technology to many parts of the food-production and processing chain. In the case of greenhouse and field vegetable production destined for processing, poultry meat and eggs, and the dairy industry, farmers tended to purchase 'packages' of genetics, feed or fertiliser and marketing directly from companies. Consequently, many provincial governments reduced or eliminated their traditional production-focused, technology-transfer services and concentrated on marketing information for specialty crops (e.g. herbs) and animals (e.g. deer), environmental regulations and special income-support programs.

During this period, Agriculture and Agri-Food Canada (AAFC) faced a 25% reduction in research funding. In response, the department phased-out all research that was in direct competition with the private sector. This included, for example, poultry genetics, machinery research, food-product development, and the release of maize hybrids. It shifted focus to those areas where the market could not yet support private technology (public good) and to basic research. There were, however, gaps that needed to be bridged. Policies were put in place to encourage the private sector to comment on AAFC's strategic research directions, to participate in government research through co-funding and to directly transfer federal technologies to end-users.

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The enabling mechanism was the Agriculture and Agri-Food Canada Matching Investment Initiative. In this program, AAFC contributed some $30 million per year to be matched by the private sector (broadly defined as entities that were not publicly funded). Again the principles were relatively simple and based upon experience gained from the Alberta–Canada Research Agreement. Specifically:

- the program was open and competitive
- projects were restricted to areas where AAFC had a science mandate and expertise
- selections were made considering the quality and relevance of the project and its potential contribution to the economy of Canada
- contributions would be cash or in-kind (staff, technology, facilities etc.)—in-kind contributions enabled some small companies and organisations to participate
- results were published but companies could request a delay in publishing for up to a year for commercial reasons
- intellectual property generated by the project would be owned by AAFC but the partner company was granted the 'first right of refusal' to practise the technology. Royalty payments were made to AAFC but used at the research centre where the technology was developed.

This initiative was successful:

- research output was greater than before the budget reduction
- interaction with the private sector was greatly expanded
- there was a good balance of large and small companies and farm organisations participating
- the relevance and quality of AAFC research was verified with positive feed-back on the value of the technology and by repeat customers
- technology was transferred to and taken-up by customers more rapidly as the company participated in development of the technology at a early stage and had a better idea of its utility

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- by partnering with specific companies, AAFC gained access to background technologies whose unavailability would block progress in certain areas of biotechnology
- some scientists developed entrepreneurial and legal skills.

But there were difficulties that had to be addressed:

- the government had no simple mechanisms to accept and account for contributions from companies or individuals
- some scientists worked in areas of research that were more suited to the program than others, creating a feeling of inequity among scientists
- scientists had to become familiar with contractual and legal agreements and devote significant time to the management of multi-party agreements, especially where companies brought background and foreground technology to the joint project
- there was some political concern about a public agency working closely with multi-national companies.

The program has been modified as required and continues today.

As part of Canada's new millennium celebration the federal government made special investments in Canada's scientific research capacity. This involved university chairs, infrastructure and foundations. An example of a foundation is Genome Canada which received a $375 million contribution to develop, implement and partially fund a national strategy in genomic and proteomics research. The objective was to bring together industry, governments, universities and research institutes in support of this national objective. Federal funding had to be matched by the other partners. Approved funding was to be allocated to large-scale genomics projects, capacity building and infrastructure at five genomics centres. This approach was borne out of necessity, as fragmented and competitive research activities do not lend themselves to large science initiatives. Further, enabling intellectual property (including research tools and genes) was frequently owned by the private sector and was blocking related development in the public sector. On the other hand, companies were finding development, protection and marketing of new agricultural biotechnology to be expensive and risky. Thus, some form of consortium or partnership was a solution for both the public and private sectors.

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Genome Canada projects involve the development of research tools, platform technologies, databases and potential products that demand appropriate strategies to deal with patents, licences, material handling agreements and publication. It was agreed that where intellectual property (IP) is created within a Centre it will belong to the researcher and/or their institution. If the IP is derived from work performed at the Centre for industrial clients on a contractual basis, the IP will be owned by the client. An agricultural example of this program is Genome Prairie, which focuses on issues such as functional genomics of abiotic stress. This project involves scientists from nine universities, three AAFC research centres, two other federal departments, numerous international collaborators and industry participation by Advanta, Adventis and Pioneer.

This initiative has enjoyed early success:

- an array of expensive but excellent research projects is under way that would not have been funded by any one group or agency
- new and extensive cooperation and sharing among researchers has been established
- research is more strategic, and focused on an interesting combination of discovery and commercial products.

There is more to do:

- the need to find partners to match the federal funding is difficult in some areas of research
- in complex partnerships considerable effort must be undertaken to identify and resolve differences in legal policies and expectations relating to IP, and to manage the outcomes.

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IS THE CANADIAN EXPERIENCE WITH PUBLIC–PRIVATE PARTNERSHIPS RELEVANT TO CHINA?

This paper considered three examples from an array of evolving public–private partnerships that are being employed to facilitate the development and delivery of technology for the Canadian agriculture and food sector and discussed some of the attendant problems and opportunities. Our experience suggests that any country contemplating public–private cooperation or partnerships should consider the following approaches as essential:

- the various levels of government continue to adequately fund basic research with strong emphasis on 'public good' research such as protection of species, preservation of germplasm, conservation of the environment etc.
- policies and laws should be in place to regulate the ownership of IP and technology and partnerships
- politicians and senior government officials must be in agreement about the objectives of partnerships and visibly support them.

Once a decision has been made to adopt a particular public–private model(s) it takes considerable effort, and some risk, to identify appropriate partners and develop agreements and their attendant operating rules. Where companies have had little experience working with public institutions they will be concerned about ownership, confidentiality, focus and timeliness. Some companies will try to use political influence and to control the outcomes of the project while making relatively little investment. A partnership must not be seen as the public subsidising R&D that would normally been undertaken by the company. Rather, it is the sharing of costs and risks of doing research that is in the best interest of the country and profitable for the company.

Again, based upon our experience, one should, at a minimum:

- experiment with a sector that understands the value of R&D and needs specific technology to be more competitive
- select partners after considering commercial, scientific and political realities
- establish mutually understood and agreed-upon objectives

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- use rules that are consistent, transparent and not seen to benefit one company or organisation over another
- establish if exclusive or non-exclusive use of the technology is appropriate
- use a governance structure that is not overly complex
- expect to adapt and accommodate throughout the agreement
- ensure there is a termination clause that is fair.

What type of organisation will make a good initial partner? Our experience was that farmer-led organisations tended to work well with the public sector as they had relatively positive experiences with extension agents, public scientists and public technology (plant varieties, pest control and production techniques). The agreements can be straightforward and focus on more narrowly defined problems in specific geographic regions. This tends to increase the chances of producing useful results in a relatively short time. In turn, it establishes a positive reputation.

The private sector, whether domestic or international, will likely be working with farm organisations and individual farmers by conducting on-farm trials to demonstrate their products. They may have working arrangements with universities but are likely to be importing technology. They probably will not move beyond this stage unless there are clear national policies relating to IP, taxation, control of imported technology versus in-country development, direct competition from state-owned facilities etc. If the business climate is positive, the private sector will select areas of activities and markets where they can provide a needed service or product with the expectation of making a reasonable return on investment in relation to other domestic or international opportunities. There will be activities that are less attractive but are important to the country and have the potential for commercial return. These are the areas most likely to produce productive public–private partnerships.

In conclusion, Canadian producers and processors have benefited from public–private partnerships in that new technologies have been developed and dispersed faster than under a public-only R&D and technology-transfer system. Some of these experiences might be useful as China engages in debate about food security, integrated food-production groups and rationalisation of public sector R&D in the new market economy.

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CHAPTER 7

LAND SECURITY AND MARKETS

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7.1 ENCOURAGING SECURITY AND RENTAL MARKETS FOR CULTIVATED LAND

CCICED ARD Task Force members

Secure property rights and well-functioning land markets are considered important catalysts for economic growth, as they make investment worthwhile and facilitate transfers of land to the most-efficient users. The efforts of the government over the past decade and the new Rural Land Contracting Law, where fully implemented, have solved most of China's land-tenure security problems. Poor security of tenure seems to have only minor effects on agricultural investment. In a recent survey, only 6 of 1200 households in 60 agricultural villages across China reported that they had had a fixed investment taken away from them over the previous 20 years. In four of these six cases, the household had received compensation.

SECURITY OF LAND RIGHTS: ISSUES AND RECOMMENDATIONS

Land security has benefits beyond promoting investments in agriculture, thus it is important that central and sub-national governments continue to make a strong and sustained effort to implement and enforce the new regulations. Land can serve as a mechanism through which farm households can gain access to credit. For example, household access to credit significantly increased in Vietnam when households received formal title to their land, since the title was used as collateral to secure bank loans. Income from renting-out land can also add to family income when families

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are engaged in off-farm activities or when they are older. Access to land by rural families has been shown to be a source of employment during times of recession in the cities and serves as a form of unemployment insurance.

Although China has made progress in promoting land security, many villages still do not provide completely secure tenure. The new contracting law tries to promote secure access to land that should further all of these functions (that is, increase access to credit, allow families to rent-out their land with little fear of expropriation and provide employment during times of economic downturn). Surveys by the China National Statistical Bureau, however, have found numerous violations over the past two years and discovered that almost half of local leaders and most farmers do not fully understand the new law.

Secure tenure is needed to ensure also that households are provided with appropriate compensation when their land is appropriated for development projects. Currently, one of the most egregious violations of the rights of rural households occurs when farmers have their land taken from them and receive only minimal levels of compensation. (In China it is not legal for villages to sell development rights directly to developers. Land must be sold to the government which resells the land to developers.) In the past five years, there were still about 25% of villages in which no compensation was paid for land that was taken away from them. The average payment for those who did receive compensation, amounted to only 12,000 yuan per mu, only a fraction of the land's true value. In most cases, the price paid to villages by the government was far below the value of the land. While it is true that in other countries too, the original land-owner rarely gets its full value when it is sold for development (in fact, internationally, the developer usually gets the larger share), the share that has gone to villages in China is only a fraction of what is typically paid to the original property owners in other countries. And when the share of the compensation that goes to villages is small, the share that goes to the individual households that own the small parcels of land is even less. While there are many reasons for this circumstance, the lack of clear ownership and land titling make compensation issues less clear.

RENTAL MARKETS FOR CULTIVATED LAND

In addition to implementing the new contracting law to promote secure tenure, additional effort is needed to promote well-functioning land-rental markets. In an economy with scarce land, off-farm employment is becoming the main source

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of future income for *most* farmers. The future of China's development will rely on the growth of off-farm income and the movement of the rural population to urban areas. In order to achieve efficiency and equity, households with opportunities off the farm need to be able to rent-out their land, and those who are left in the village need to be able to rent-in land so that they can raise their incomes from farming. Increases in farming income for those left in rural areas are important for stability as well as for providing the resources that will let them invest for the benefit of future generations that can continue to push China's modernisation.

Over the past decade, the record on rental markets for cultivated land is clear: while still not completely developed, their emergence is well under way. According to data from national surveys, rental markets for cultivated land in China began to emerge in the late 1980s. At that time, however, only 1% of land was rented. By 1995, around 3% of cultivated land was rented. According to China's 2003 national household survey, more than 10% of households nationwide rented-in land. In some provinces, such as Zhejiang, up to 20% of the cultivated land is rented.

There are many indications that the growth of cultivated land markets is improving efficiency. Rental markets have been shown to shift land from those who have relatively large quantities of land to those with lower quantities. Across China, land rental occurs more frequently in regions that have high levels of migration. For example, while the average rental rate in China was 10% in 2000, it was 15% in China's central provinces (provinces with high migration rates), such as Hubei and Anhui. When examining household data, it is clear that migrant households are more inclined to rent-out land, while households that have few or none of their members working off the farm, rent-in land. Rental markets in China are increasingly moving land away from those who are less efficient at farming to those who are more efficient.

Survey data indicate that land rental markets assist in poverty reduction. Households renting-in have less than half the level of assets of those that rent-out. The households that rent-in also have lower endowments of land. And perhaps most importantly, the per-capita income of those renting-in is significantly lower than those who rent-out. Interestingly, this result is quite unintuitive, and, as such, important. There are many who probably believe rental markets benefit mainly the rich, as such markets did in the period before the 1950s. According to a number of data sources, however, this is no longer true.

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Land rental markets promote efficiency and equity. And since they raise the income of those engaged in agriculture, they will lead to higher output. Finally, because rental markets provide land to families in villages that have high rates of migration, they also contribute to poverty reduction.

GOVERNMENT POLICY AND LAND

Despite the recent improvement in tenure security and the emergence of rental markets, policy makers still have an important role to play. In order to ensure even better security, the central government needs to make repeated efforts to publicise, through various channels, the salient clauses that affect farmer rights. Strong directives through both the government and party hierarchy need to convey the importance of the new Rural Land Contracting Law.

New regulations are also needed to protect the rights of farmers when their land is being bought for development. For example, clear property rights and regulations that allow land sales transactions directly between developers/city-users and villagers are needed to protect the interests of villagers. Titling will also help.

Although rental transactions should occur between households that are seeking to improve their welfare, there is an important role for government in promoting the mobility of land among users. The experience in other countries indicates that formal land registration can lead to increased rental market activity and lay a foundation for banks to begin to use land as collateral for loans. In general, registration gives additional protection to farmers by improving transparency in land transactions. Moreover, if it is administered at a high enough level, farmers across large regions can be provided uniform certificates of registration that will broaden the market and make registration more valuable. For these reasons, a provincial-level pilot trial of land use rights registration is suggested. It has been shown in other countries that land registration is one of the most productive and useful loan/grant packages (in terms of its impact on raising the productivity of the agricultural economy). It can be done with a minimum burden to the government. Land registration loans are largely self-financing, since registration fees paid by farmers are usually sufficient to pay back the entire amount of the loan. Land titling, however, can succeed only if the titles are given the utmost authority in a legal sense (that is, the titles give the holder controlling rights over the land).

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7.2 RURAL LAND AND LABOUR MARKETS IN THE PROCESS OF ECONOMIC DEVELOPMENT:

EVIDENCE FROM CHINA

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INTRODUCTION

The 'East Asian miracle' is generally regarded as one of the most successful development paradigms in the 20th century. Following this pattern, Japan, Korea and Taiwan experienced rapid transformation from a rural towards an urban society based on industry rather than agriculture as the main source of income. During the 'takeoff periods' large fractions of the rural population moved off the farm into urban manufacturing jobs, fuelling sharp rises in productivity and incomes. Almost as important, during industrialisation and urbanisation phases, leaders were able to reduce poverty among those left in rural areas and maintain a healthy agricultural sector, thereby attenuating trends toward increased inequality (Johnston and Mellor 1961; World Bank 1993).

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In many ways, China's path of development during the past two decades has been similar to that followed by Japan, Korea and Taiwan. Starting with a largely rural population engaged in farming, many rural residents have reoriented their livelihood strategies. Off-farm work has emerged as a main source of income growth for many rural households (Lohmar 1999; Kung 2002). Up to 100 million migrants live away from their home villages. Family-owned businesses and privately run factories provide increasing levels of employment in rural areas. To an extent never experienced before, young and better-educated workers moved to cities, while their remittances or the assets they brought back upon their return contributed to rising rural incomes (de Brauw et al. 2002).

Despite the historical similarities, China now confronts challenges which in many ways exceed in complexity those that were faced and overcome by Japan, Korea and Taiwan (OECD 2002). Those countries aggressively used trade barriers and other pricing measures to raise the returns to farming and increase the value of the assets of rural residents.[1] Even though there is little doubt that they did so at a (unnecessarily) high cost to society, such pricing policies have helped to keep rural incomes and asset values high, thus contributing to the reduction in poverty and rise in rural incomes without radically changing either the farm size structure or existing production patterns. China, by contrast, is going through the early stages of development in an environment where reliance on either input provision by parastatal institutions or output price subsidies as a means to ensure a minimum standard of living for rural areas is no longer an option. Instead, it will have to grow in an environment where producers and consumers, including those who work and live in poor rural areas, will need to gain access to factors of production mainly through markets, and base their economic decisions on the price signals these markets generate.

Even though such a market-based strategy, especially if combined with provision of productivity-enhancing public goods, can contribute to a rapid transformation of the productive structure in rural areas, its feasibility depends critically on the presence of an institutional framework in which markets will be able to function. For example, the definition of property rights is not costless, and even where such rights are well-defined, indivisibilities and informational imperfections can create barriers to participation that will make it difficult for markets to contribute to greater

[1] Even today the domestic prices of rice and other key agricultural commodities in Japan, Korea and Taiwan are several times higher than international ones.

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efficiency and equity (Deininger 2003). Such concerns are particularly relevant for land markets, for two reasons. On the one hand, land has many characteristics that tend to limit the scope for operation of markets. Also, China has made the transition towards private land-use rights only in the 1980s, with many restrictions remaining that make land rights differ significantly from ideal property rights. In view of this, it would not be surprising to find imperfections in the way in which land markets operate that could lead to serious questions concerning the sustainability of China's development paradigm. As the heated recent debate on rising inequality in China demonstrates, this could have far-reaching implications for policy.

The goal of this paper is to contribute to this debate by characterising in more detail the operation of land markets and links between labour and land markets in rural China. Based on this characterisation, we make inferences about the likely impact of these markets on economic efficiency and equity. To do so, we pose two questions.

First, we ask if the functioning of labour markets is consistent with the objective of better development of the agricultural economy or if migrant labour contributes to draining rural areas of their best potential in terms of human capital. This question has been intensely debated in the literature on the nature and impact of labour markets in China (de Brauw et al. 2002). We add to this literature by including a measure of the household's agricultural ability to assess whether migration and the emergence of a local non-farm economy is indeed a zero-sum game that lures away the best and brightest from rural areas or whether, by providing scope for productivity gains through more-efficient allocation of scarce resources, the process actually contributes to broader economic development.

Second, we explore whether or not the functioning of labour markets in rural China generates benefits that extend beyond those who participate directly. In an environment where property rights are well defined, information is readily available and other markets function well, one would indeed expect such synergies. Indeed, more-active labour markets can establish the preconditions for the operation of land markets that would not only enhance productivity by transferring land to better users but also, by allowing those who stay behind to expand their holdings and thus their base of sustenance, contribute to greater equity. In the case of China, scholars differ widely in their assessments of the efficacy of land markets (Benjamin and Brandt 2002). Hence, the direction of the efficiency and equity effects on the rise of land and labour markets is by no means a foregone conclusion and rigorous empirical assessment is warranted.

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Compared with other studies of the rural sector in China, our analysis offers two advantages. First, by using a data-set that is representative of the rural sector, we are able to capture the significant variability across China's regions. Second, by analysing land and labour markets together rather than looking at each of them separately, we are able to demonstrate the links between the two markets, as well as the fact that greater activity in labour markets improves the functioning of land markets as well. Results suggest that increasing reliance on market forces provides, in a context of rapid globalisation, an avenue for China to increase rural productivity while at the same time helping to safeguard basic equity concerns.

The paper is organised as follows. Section two reviews the challenges to which the rural sector in China has to respond, outlines the conceptual model and discusses the data, econometric issues and estimation strategy. Section three presents a number of descriptive statistics on the functioning of rural factor markets. Section four provides econometric evidence on household participation in off-farm labour markets (migration and local non-farm labour markets) and land markets and the links between the two. Section five concludes by discussing the policy implications and raising a number of issues for future research.

CONCEPTUAL MODEL, DATA AND ESTIMATION STRATEGY

To put the issues at hand in perspective, and illustrate the benefits from analysing land and labour markets in a more integrated way, we first review the evidence on a number of challenges confronting China's rural areas and discuss the contribution that rural markets can potentially make to help meet these challenges. We use this as a basis for a simple model of rural diversification and the emergence of markets in rural areas, point out the strategy for econometric estimation, and describe the data to be used for doing so. Traditionally, rural factor markets, especially those for labour and land, have often been analysed in isolation from each other. As background to considering them jointly, we use this part of the paper to review some of the key development challenges facing China and the role which such markets might have to play in formulating a policy response.

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Key challenges for China's rural economy

Accelerated migration

China experienced a rapid increase in the importance of inter-regional migration during the 1990s. Survey data show that the share of migrants in the labour force increased from 5% in 1988 to more than 10% in 1995 (Rozelle et al. 1999a) and that, after further acceleration in the late 1990s, in 2000 there were more than 80 million migrants, comprising about 17% of the labour force (Taylor et al. 2003). A number of sources show that migrants are covering increasingly large distances and, in general, are moving towards large coastal cities (Rozelle et al. 1999a; Solinger 2002). Researchers also agree that participation in migration is particularly high among the poor (Parish et al. 1995; de Brauw et al. 2002) and that migration can help to reduce poverty, e.g. through remittances (Zhang et al. 2003). Some urban firms have become less discriminatory in their hiring of people without an urban residential permit (*hukou*) (Knight and Song 2003). Evidence on the contribution of migration to local economic development in rural China (Zhao 2002), together with experience from other countries, suggests that, through remittances and returning migration, migration can provide important backward linkages that in turn facilitate asset accumulation and economic development in backward areas. The literature has also pointed out that land-tenure arrangements and mandatory marketing delivery quotas could increase the cost of out-migration, thus posing barriers to the ability of workers to take advantage of such opportunities (Yang and Zhou 1996; Hein 2000; Fleisher and Yang 2003). This suggests that land and labour markets are likely to be closely linked and should ideally be viewed and analysed jointly.

Rising inequalities

Although China has, over the past two decades, experienced some of the highest growth rates in the world, the increase of Gini coefficients for per-capita expenditure, which nearly doubled in the 1980–2000 period, suggests that the opportunities created by such growth were not equally accessible to all (Khan and Riskin 1998). In particular, urban incomes have risen faster than rural ones for almost the entire period, leading to widening imbalances between rural and urban sectors (Fleisher and Yang 2003). Part of this can be attributed to gaps across regions and sectors that remained from socialist times (World Bank 1997). However, ill-functioning markets for land, labour and credit have also frequently been cited as a reason why China's prosperity has bypassed large parts of the rural population (Benjamin et al. 2003; Kanbur and Zhang 1999).

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The challenge of WTO accession

The restrictions imposed by China's integration into the international trading system are likely to exacerbate the consequences of regionally unequal growth. China's World Trade Organization (WTO) entry is likely to reduce prices for many crops widely grown in rural China, putting a premium on more capital- and knowledge-intensive commodities.[2] While average effects on the farming sector may be small, poorer producers of staple grains and fibres in central China will be disadvantaged by the first-round effects of such reforms (Huang et al. 2003). The longer-term effect, however, will depend on the extent to which households can respond by moving into sectors where China has a comparative advantage, including horticulture, livestock and off-farm activities (Huang and Chen 1999). The ability to shift towards such activities will, in turn, depend on well-functioning markets for output as well as labour and land. WTO agreements limit the type of interventions that Chinese policy makers can use to address regional imbalances largely to non-distorting infrastructure and productivity-enhancing investments (Fan et al. 2000). While such investments are considered to be the most-efficient way to improve productivity and sectoral efficiency, well-functioning markets are needed to ensure that farmers will be able to benefit from such investments.

Increasing importance of self-employment in local off-farm labour markets

The rise of off-farm self-employment whereby rural residents obtain a large part of their income as traders, merchants and small and medium-scale individual- and household-run businesses (Entwistle et al. 1995), is one of the most-significant recent employment trends in rural China. Between 1988 and 1995, the number of households in rural off-farm self-employment is estimated to have increased by up to 30 million, making off-farm self-employment the fastest-growing sector in rural China (Rozelle et al. 1999b). During this period, almost 40% of new, rural off-farm jobs were contributed by small and medium entrepreneurs who also experienced a significant increase in their human capital endowments (Cook 1999; Zhang et al. 2002). Even though numbers of migrants grew faster than those of the self-employed in the late 1990s, small businesses also matured, often changing from labour-intensive handicraft producers and providers of labour-intensive services

[2] For example, prices for wheat, maize and cotton are expected to fall by 10–20%, while those for livestock products and horticulture are expected to rise by 5–15% (Huang et al. 2003).

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into more-capital-intensive, complex businesses engaged in transportation, trading and manufacturing (Mohapatra et al. 2004). While there is scope for more in-depth analysis of this phenomenon, increased earnings from off-farm self-employment made a major contribution to increasing China's rural incomes in the late 1980s and 1990s (Parish et al. 1995).

Expansion of land rental and legal changes in property rights

A number of contributions to the literature point towards a significant increase in land-market activity over time. In 1988 and 1995, farmers rented-in less than 1 and 3%, respectively, of cultivated area (Benjamin and Brandt 2002), while in 2000, 7% of China's arable land was rented-in (Zhang et al. 2002). Retrospective information also indicates that, in three of China's most-backward provinces, land-rental markets had been virtually non-existent five years ago but were, in 2002, used by almost 10% of households (Deininger et al. 2003a). One reason for limited rural land rental was that, until very recently, imbalances in households' land access were to be rectified through periodic administrative reallocation by village leaders (Kung 1995).[3] This weakened property rights to land, thereby limiting the scope for decentralised markets to operate and, to the extent that there is a high correlation between migration and land-rental activity, may also have reduced incentives for migration and involvement in non-farm labour markets (Kung 2002).

Model and hypotheses

To provide a basis for understanding the links between the operation of land and labour markets, we use a simple model from which we can deduce empirically testable hypotheses. Let rural households, indexed by i, be endowed with land T_i, labour L_i and capital assets K_i as well as a given level of agricultural ability A_i and formal education E_i. Households can choose to use their labour endowment either in farming, local off-farm employment or migration. Farming (Ag) follows a Cobb-Douglas production function, $f(T, l_{ag}, K)$, that obeys standard regularity conditions (i.e. $f' > 0; f'' < 0$). Migration (M_i) pays a wage w per unit of labour spent and is independent of the level of education and ability but, because it involves physical movement from the place of residence, is incompatible with agricultural

[3] In fact, in a 1998 survey, most villagers still viewed administrative reallocation as the only mechanism to allow equalisation of operated area across households (Kung 2002).

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or self-employment activity. The local, off-farm labour market consists of the self-employed *(Se)* whose returns per labour unit l_{Se} follow a function *n(E, K; Q)*. In line with the literature, to start-up self-employment, a minimum level of capital, $\bar{K}$ is needed. Under these conditions, allocation of the available labour endowment between agricultural activity, self-employment, and migration by the representative household with the goal of maximising income leads to labour-supply functions li^* *(T, K, E, A)* with $i = Ag, Se, M_i$. Comparative statistics on these yield the following testable hypotheses:

Hypothesis 1

Households with limited endowments of land and physical and human capital, and low agricultural ability, will choose migration as a potential pathway out of poverty. In areas where demand for local services is limited, households which have only a limited amount of land and few agricultural skills will tend to migrate out. By contrast, in areas in which there is higher labour demand from manufacturing and service enterprises, the household's propensity to allocate labour to the off-farm labour market is expected to be higher.[4] This also will help improve equity, because by drawing on migration income, migrants or their families will be able to accumulate capital that can, in the long term, help them to cross the threshold to self-employment. As a corollary, and a direct consequence of the higher (human or physical) capital requirement of local non-farm employment, we would expect that participation in this activity will be more pronounced among those with higher levels of wealth or education. The same reasoning would be expected to hold not only for household heads but also for their offspring. Given that most household heads made choices about their sector of employment a long time ago, and the international evidence suggesting that, in many cases, the shift from agriculture to non-agriculture is associated with generational transition (Ahituv and Kimhi 2002), one would expect to see the impact of the labour market and other factors more clearly in the case of offspring.

[4] This is in line with evidence from the literature, according to which those with higher levels of financial and human capital will choose to become self-employed (Taylor et al. 2003).

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Hypothesis 2

Higher levels of migration and, to a lesser extent, participation in the local non-farm labour force, will help activate land-rental markets, thereby providing additional benefits to the migrants as well as those who stay back. Migrants will benefit because renting-out will allow them to gain access to rental income during their absence without having to give up the option of resuming own-cultivation in subsequent seasons, for example if they lose their migration job. Those staying back will benefit because access to additional land resources will allow them to make better use of their non-tradable endowments (agricultural assets and agricultural ability) and increase their income beyond what would have been possible in autarky. Thus, migration and the associated higher level of land rental activity together would be expected to be mutually reinforcing in setting in motion a process that will increase the household's well-being and contribute to at least a narrowing of pre-existing income gaps. Even though the literature has made this point at a conceptual level, illustrated with descriptive evidence (Kung 2002), no rigorous demonstration for a larger sample is available.

Hypothesis 3

In addition to their positive equity effect, more-active land-rental markets will help to increase overall productivity in rural areas by transferring land from producers with low ability to those with higher levels of ability. Use of panel data allows us to make inferences on this variable that can be used to test for the extent to which land-rental markets will contribute to greater allocative efficiency by transferring land to better producers. Moreover, to the extent that the presence of land markets allows producers to make a conscious choice, we would expect that it will be those with low agricultural ability who engage in migration or participate in the non-farm labour force, thereby increasing the productivity benefits to be obtained in the process of structural change in rural areas. In the long term, market-based land transfers of land groups can also contribute to consolidation that will allow more-able households to increase their cultivated area in a way that is preferable to administrative solutions (Lin et al. 1997; Wan and Cheng 2001).

The hypotheses identified above can be translated into econometric equations to assess determinants of the household's participation in migrant and non-agricultural labour markets, and of supply and demand for land rental. The interaction of labour and land markets will increase productivity if one can show that: (i) it is those with

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lower agricultural ability who use labour markets to exit this sector; (ii) greater labour-market activity in any given location will help to activate land-rental markets; and (iii) land-rental markets provide an opportunity for those with high agricultural ability to gain access to additional land. Having information on the initial asset endowment of those participating will allow us to make inferences on the equity impact of land and labour markets.

Data sources, estimation strategy and econometric issues

To test these predictions empirically, we estimate equations for household participation in migration, self-employment and land rental (both renting-in and renting-out). We first discuss data issues. We then provide more detail for each of the estimating equations as well as the predicted coefficients.

Data for the regressions are from a 30% sample from China's rural Household Income and Expenditure Survey (HIES), a nationally representative, continuing survey of more than 50,000 rural households by China's National Bureau of Statistics (CNBS).[5] The survey collects data on household consumption through diaries that are checked by survey staff twice a month. As a result of the intensive data-collection effort and close interactions between monitors and respondents, the quality of expenditure data is judged to be very high (Jalan and Ravallion 1999). Additional information on the allocation of labour time by all household members, the nature of activities performed and income obtained, details on endowments with land and other assets, as well as agricultural production, are collected through supplementary surveys. The 2001 survey was the first to include information on household participation (on the supply or demand side) in land-rental markets, including the area of the land transacted.[6]

[5] In our study, we use the traditional/formal definition of 'rural', which includes all households that have been assigned rural residential permits (*hukou*). The sample comprises 29 provinces and uses a two-stage sampling procedure.

[6] Note that, to the extent that the survey selects households which are able to fill out the expenditure module on a continuing basis, it may be biased against those most likely to supply land to the rental market. Therefore, the estimates on this topic are likely to constitute a lower bound of the true value.

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Participation in migrant labour markets

To identify the determinants of participation in migrant labour markets by both the household head and their children, we estimate probit or tobit equations of the form

$$M_i = \alpha' + \beta'\alpha_i + \delta_j'Z_{ij} + \omega_i \quad (1)$$

where M_i is either a dummy variable that takes the value of 1 if there was participation in migration in 2002 and 0 otherwise, or a continuous variable measuring the number of months spent migrating. In line with our model, explanatory variables are α_i, the household's level of agricultural ability, and Z_{ij} a vector of household and village characteristics. Household characteristics include the household's endowments of human capital, labour and other productive assets including land (per capita). To control for the availability of economic opportunities at the village level, we include mean village per-capita expenditure as another right-hand-side variable.

Based on our model, we expect that households with higher levels of agricultural ability will be less likely to participate in off-farm migration (i.e. $\beta < 0$). Similarly, we expect higher per-capita endowments of land and agricultural assets, as well as higher levels of education and non-farm assets at the household level, to reduce the propensity to migrate. The latter is due to potential threshold requirements to set up non-farm enterprises which normally offer higher returns to education and assets than off-farm migration while at the same time avoiding some of the transaction costs that migrants have to incur (Zhao 1999).

Since we have data on household heads and their dependants, we estimate equation (1) separately for both groups. One reason for doing so is that this allows us to capture the dynamics of the diversification of households out of the agricultural sector which is often linked to generational transition (Kimhi and Bollman 1999). The regression for migration by children is similar to the one estimated for the household head, with the exception that we do not have an estimate of agricultural ability for the children and, in addition, we must use their own human capital endowments (that is, their own educational level and age) rather than those of the household head.

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Participation in the local off-farm labour market

To identify the determinants of participation as a self-employed entrepreneur by either the household head or their children, we estimate a probit (tobit) equation of the form:

$$S_i = \alpha' + \beta'\alpha_i + \delta_j'Z_{ij} + \omega_i \qquad (2)$$

where, similar to equation (1), S_i is either a dummy variable for participation or denotes the number of months spent in local off-farm employment by the household head or their offspring during 2002. Right-hand-side variables are identical to those in equation (1). To the extent that starting a self-employed enterprise is contingent on a certain threshold of wealth, we expect the coefficient on non-agricultural assets to be positive.

Land-market participation

To identify the determinants of land-market participation, we specify a reduced form regression for renting-in (-out) cultivated land through land-rental markets. Formally, we estimate:

$$R_i(O_i) = \alpha + \beta\alpha_i + \delta_j Z_{ij} + \varepsilon_i \qquad (3)$$

where $R_i(O_i)$ is a dummy variable that is equal to one for renting-in (-out). Alternatively, we can use a tobit model to estimate equation (3) when the dependent variable is equal to the actual quantity of land area (in mu) that is rented-in (-out) by the *i*th household. As in equations (1) and (2), α_i is the household's agricultural ability and Z_{ij}, is a vector of j other household- and village-level factors that affect land-market participation and ε_i is an *iid* error term. Most of the right-hand-side variables are identical to those used in the earlier equations.

Given that land cannot be transferred across villages, the hypotheses discussed earlier imply that the level of migration at the village level will be an important trigger for the emergence of land-rental markets. To capture this, we include the share of households in the village who have sent out migrants and the share of households who shifted into local off-farm employment. We predict that both variables will have a positive impact on supply of land for rental and thus lead to greater observed land-rental market activity. To establish a link between labour and land markets at the household level, we include an indicator variable for the household's involvement

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in migration or the local off-farm labour market in the land-rental equation as well. Because farmers' labour-market participation might be determined simultaneously with their other economic choices, inclusion of this variable could lead to simultaneity bias. To avoid this problem, we include the household's past participation in off-farm labour markets and report results both with and without this variable.

DESCRIPTIVE EVIDENCE

Contrary to most contributions to the literature, which are often based on small and non-representative samples, the ability to draw on a data-set that is representative of China's rural sector allows us to obtain a better picture of regional differences in the level of diversification of economic activity and household incomes. Linking these indicators to levels of activity in rural land and labour markets allows us to give a descriptive account of some of the underlying relationships that can subsequently be subjected to testing by more-rigorous econometric techniques.

Income composition and household characteristics

Table 7.1 has information on income and its composition (panel 1), participation in labour and land markets (panels 2 and 3) and a number of other household attributes (panel 4), for all of China (column 1) and broken down for different regions (columns 2–5). The ability to draw on the full CNBS sample implies that the descriptive statistics obtained are almost identical to those reported in official publications.

Levels and composition of income

Survey data on levels and sources of income confirm the relatively high levels of diversification of income sources, as well as inter-regional differences in income levels. With a national average per-capita income of 2681 yuan, per-capita income in coastal provinces (3894 yuan) is more than double that attained in the country's southwest (1794 yuan). Similarly, while agriculture still makes the largest contribution to overall rural household income (37%, followed by income from local off-farm wage and self-employment with 25% and 29%, respectively, and migration remittances with 9%) at the national level, this is no longer the case in all of the regions. For example, in the coast region, local self- and wage-employment together contribute 62% of average income, with agriculture's share having declined to 28%. At the same time, with 41% of income, agriculture is still the main source of income in the country's central region and in the southwest.

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Table 7.1 Key indicators of labour and land market activity in China's main regions, 2001[a]

	All China	North & northwest	Coast	Central	South-west
Income level and composition					
Mean per-capita income (yuan)	2,681.3	2,646.1	3,894.0	2,390.9	1,794.1
Agricultural production (%)	36.8	38.2	27.9	40.5	40.5
Local off-farm wage employment (%)	25.1	27.7	32.1	21.2	19.1
Local off-farm self-employment (%)	29.1	28.2	30.6	25.4	32.3
Remittances from migration (%)	8.9	6.0	10.5	12.6	8.0
Participation in economic activities					
Households engaging in local off-farm self-employment	10.5	7.3	14.4	11.1	9.2
Households with migrants	37.1	24.6	34.8	47.3	37.1
Months spent in local off-farm employment	10.0	8.3	13.7	9.2	7.6
Months spent in migration	4.1	2.4	4.4	5.4	3.6
Agricultural endowments					
Per-capita land endowment (mu)	1.6	2.1	1.0	1.3	1.4
Share of households renting-in	8.9	7.1	9.4	10.4	7.5
Share of households renting-out	6.2	4.9	8.8	5.1	5.7
Rented to own land ratio[b]	0.5	0.5	0.59	0.50	0.4
Number of sample households	54,590	12,390	14,680	14,860	12,660
Other household characteristics					
Household size	4.2	4.0	4.1	4.3	4.4
Age of household head	45.0	44.9	46.4	44.9	43.5
Head's education (years)	8.5	9.0	8.6	8.4	7.9
Children above 14 years of age	1.2	1.1	1.3	1.3	1.2
Observations in 'reduced' sample	15,873	3,312	4,700	4,219	3,612

Source: Computation from China National Bureau of Statistics 2001 Household Income and Expenditure Survey.

[a] The north and northwest region includes the provinces of Hebei, Shanxi, Liaoning and Henan; the coastal region includes Jiangsu, Zhejiang, Fujian, Shandong and Guangdong; the central region includes Anhui, Jiangxi, Hubei, Hunan and Guangxi; and the southwest region includes Sichuan, Guizhou, Yunnan, Shaanxi and Gansu.

[b] Only for households who are renting-in.

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Migration

Although neither the sample nor the survey instrument have precise measurement of migration income as their primary goal, the survey used can provide interesting evidence on participation in non-farm and migrant-labour markets. The data suggest that China's labour markets have been emerging rapidly and that the share of households which obtain at least some benefits from migration (37%) is much larger than the contribution of migrant remittances to household income (9%). This is consistent with the literature, which suggests that, even in cases where migrant remittances constitute only a small part of household income, their importance as an insurance substitute, a means to smoothing consumption, and to overcome credit market imperfections may be very significant. In line with this reasoning, migration is particularly large in the poorer regions: while only 25% of households have at least one migrant member in the north/northwest, this share is almost double (47%) in the central part of the country and, at 37%, still fairly high in the southwest.

We also note that, in 2001, 11% of households managed their own enterprises and 37% had at least one member participate in the migrant labour force. With the average migration spells lasting for 4 months, the mean household in China supplied 14 person-months to the non-farm labour force. At a regional level, more than 14% of households in the coastal region have invested in self-employed businesses, but only 7–9% of households in the poorer north/northwest and southwest regions have. Households in wealthier areas are more likely to become self-employed (e.g. in response to higher demand for services) and are more able to get a wage-earning job in the local off-farm labour market. Poor areas rely more on agriculture and migration.

Other household characteristics

Use of our 30% sample allows us to provide information on a number of other household characteristics. Doing so suggests that, at least at first glance, the large differences in per-capita incomes are not substantiated by equally large differences in household endowments. On the contrary, the mean household sizes vary between 4.0 and 4.4, with between 1.1 and 1.3 dependants above 14 years old and a fairly high level of average education of household head that varies between 7.9 and 9.0 years with the highest values obtained in the north rather than on the coast.

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Land-market participation

Based on information from the 2001 survey, which for the first time included a module on land-rental-market activity, we find that 9% of households nationwide rented-in land while 6% rented-out land (panel 3 of Table 7.1).[7] Comparison with historical data suggests that, after almost complete elimination of land-rental markets during the 1980s, the level of land rental in China may once again be approaching levels that are closer to those observed before the socialist era. Although there are some regional differences, all of the regions are characterised by comparatively high levels of land-rental-market activity.[8] We also observe a positive correlation between activity in land and labour markets as a first indication of synergies whereby land and labour markets would mutually reinforce each other, e.g. because higher levels of migration and off-farm activity result in greater availability of land that can then be allocated through market mechanisms at the local level. While household survey data are not well-suited to provide estimates for village-wide levels of activity in land rental or migration, village-level data for the 1105 villages from which the households included in our sample originate indicate simple correlations between the share of households with at least one member migrating and the share of households who rented-in/out land of 0.20 and 0.13, respectively, both significant at the 1% level of confidence. Table 7.A1 in Appendix 1 illustrates this relationship at the provincial level: in poorer provinces, rental markets are more active in provinces with higher levels of out-migration (Jiangxi, Henan, Hubei, Hunan and Anhui), while at higher levels of income (e.g. in Zheijiang, Shandong, Guangdong), local off-farm employment tends to increase land-rental-market activity.

To go one step further in exploring the characteristics of land-market participants, Table 7.2 compares a number of attributes that should, according to our model, be associated with higher levels of land-rental-market activity between those who are renting-in or renting-out land and the mean for the remainder. The results provide strong evidence in favour of the redistributive nature of land-rental markets. As Table 7.2 illustrates, households with lower per-capita land endowments, significantly lower per-capita income and non-farm asset endowments (though insignifi-

7 This is not surprising given that some of those renting-out may not be present in the survey.

8 Not surprisingly, the spatial variations widen when we disaggregate regions (Appendix Table 7.A1). For example, 20% of households in Zhejiang Province rented-in land. During the same year, only 2.9% of households in Gansu did so.

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cantly different agricultural assets), and lower participation in off-farm employment and remittances, rely disproportionately on renting-in land as a strategy to increase their operational area and income. By contrast, those renting-out are shown to have significantly higher levels of wealth, land and participation in the non-farm economy. This suggests that land-rental markets provide an opportunity for the poor in rural areas who are not well-positioned to participate in migration or other non-farm economic activities. To test these predictions econometrically, we need to obtain a measure for the household's agricultural ability, α_i. We also make use of the fact that all of the 15,873 households in our 'econometric' sub-sample were interviewed in both 2000 and 2001.[9] This allows us to estimate a crop-production function to derive both household- and village-level fixed effects and to obtain each household's agricultural ability (α_i – net of any unobservable village-specific factors) by subtracting the household fixed-effects from the village fixed-effects. The creation of the agricultural ability variable is discussed in more detail in Appendix 2.

ECONOMETRIC RESULTS

Consistent with the descriptive findings, results from econometric analysis provide strong support of our hypotheses that it is those with relatively low skills who will join the migrant or non-farm labour force. The results also show that those with relatively inferior agricultural skills will tend to supply land to the rental market, whereas those with superior skills will tend to rent-in additional land. In addition, we are able to demonstrate quantitatively that higher levels of labour-market activity (either migration or non-farm employment) indeed make a significant and positive contribution to the level of activity observed in land-rental markets. Together with the fact that there is no evidence to suggest a negative equity impact of land-rental markets, this leads us to conclude that the combined activity of land and labour markets contributes to economically desirable outcomes. While the descriptive statistics reported earlier are derived from the full sample, the econometric analysis uses data from a subset of almost 16,000 households for 19 of 30 provinces included in the CNBS sample.

[9] For the econometric analysis we use a 30% sub-sample of the households included in the CNBS master sample for the provinces of Hebei, Shanxi, Liaoning, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Hubei, Hunan, Guangdong, Guangxi, Sichuan, Guizhou, Yunnan, Shaanxi and Gansu which, together, contain more than 80% of China's total population. The sample is stratified by overall levels of rental market participation.

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Participation in migration and local non-farm employment

Probit and tobit regressions for the household head's participation in migration (Table 7.3, columns 1 and 3) and local off-farm employment (columns 2 and 4) support the efficiency- and equity-enhancing nature of migration, as predicted in our hypothesis. The negative coefficients on agricultural skills in both regressions support the hypothesis that migration or joining the off-farm labour force are avenues that will be most attractive to those with limited agricultural skills. To illustrate the magnitudes

Table 7.2 Asset holdings and economic activities of households renting-in and renting-out land in 2001

	All China	By households' rental market participation		
		Rent-in[a]	Rent-out	Autarkic
Owned land per capita (mu)	1.4	1.4**	1.7**	1.4
Operated land per capita (mu)	1.5	2.0**	1.1**	1.4
Original value of agricultural assets (yuan)	775.5	811.5	739.9	771.8
Original value of non-farm assets (yuan)	420.0	236.8**	556.7**	450.2
Household's own draft animal (%)	31.5	37.7**	26.0**	30.7
Per-capita income (yuan)	2686.0	2582.9**	3024.3**	2636.2
Agricultural income share (%)	38	52**	31**	40
Local off-farm wage income share (%)	33	27**	35**	31
Local off-farm self-employment income share (%)	17	12**	21**	18
Remittance income share (%)	11	9*	13**	11
Months spent in migration	3.7	3.6*	4.7**	4.0
… of which head (%)	18.0	12.8**	19.1	17.5
Months in local off-farm employment (wage-earning and self-employment)	10.0	8.7**	12.2**	9.9
… of which head (%)	33.3	31.0**	36.2*	34.0
Number of observations	15873	3332	2590	9951

Source: Computation from China National Bureau of Statistics 2001 Household Income and Expenditure Survey.

[a] Stars indicate that the value for the respective sub-group is statistically different from the mean: * significant at 5%; ** significant at 1%.

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involved, note that the least-skilled producers in the sample are about 10% more likely to join the migrant labour force but about 40% more likely to take up local non-farm employment. To the extent that those who rent-in land through rental markets have higher-than-average ability, this would suggest an overall increase in economic efficiency, something we will come back to later.

The negative coefficients on the household's asset endowment in the migration equations suggest that joining the migrant labour force can provide poor households with an opportunity to improve their economic well-being. This is supported by the fact that it is those in the sample with levels of education significantly below the mean who are most likely to participate in migration. The impact of education on the propensity to migrate has the shape of an inverted U that reaches its maximum at about 5 years of education, implying that a minimum level of human capital is required in order to participate in migration. At the same time, presumably because returns to human capital in temporary long-distance migration are quite low, the propensity to migrate-out decreases beyond an educational attainment of 5 years. The village mean of expenditure is negative, indicating that there may be a push factor that causes residents from marginal locations to migrate-out. Both the head's age and the household's labour endowment, measured by the number of children at working age, have a very significant and strong positive impact on the propensity to migrate. At the same time, the fact that the coefficient on owned land is negative though insignificant would suggest that lack of access to land is not one of the main motivations for households to join the migrant labour force, contrary to what is observed in many other developing countries, such as India, where access to land is more unequal than in China.

Comparing these results with determinants of the head's participation in local off-farm employment is instructive: heads going into off-farm employment have higher levels of non-farm assets and education, but also significantly lower endowments of land. The importance of education as a determinant of joining the local non-farm labour force is particularly remarkable: according to the probit regression, every additional year of education above the sample mean (of 8 years) will increase the probability of participating in local non-farm employment by at least 2%. The result that individuals with more non-agricultural wealth are more likely to join the local non-farm labour force is consistent with a minimum capital requirement for establishing an own enterprise, e.g. because of ill-functioning capital markets (Kanbur and Zhang 1999). In addition, even though local-income

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Table 7.3 Probit and tobit regression coefficients of determinants of household head's participation in migration and local off-farm employment

	Probit models		Tobit models	
	Participation in migration	Participation in local off-farm employment	Months of migration	Months of local off-farm employment
Agricultural ability	−0.057*** (7.70)	−0.205*** (12.30)	−3.668*** (7.73)	−2.883*** (18.22)
Owned land per capita	−0.001 (1.46)	−0.005** (2.11)	−0.098*** (3.05)	−0.099*** (9.47)
Value of agricultural assets (log)	−0.003** (2.36)	−0.013*** (7.21)	−0.198*** (3.25)	−0.160*** (7.71)
Value of non-agricultural assets (log)	−0.004*** (3.94)	0.018*** (4.75)	−0.242*** (4.93)	0.230*** (14.77)
Years of education obtained by head	0.007** (2.48)	−0.006 (0.91)	0.394** (1.98)	−0.123** (2.01)
Head's education squared	−0.001*** (2.96)	0.001*** (3.16)	−0.027** (2.26)	0.021*** (5.66)
Head's age	0.009*** (3.89)	0.019*** (5.27)	0.530*** (4.44)	0.193*** (5.51)
Head's age squared	−0.0002*** (6.75)	−0.0003*** (8.48)	−0.010*** (7.36)	−0.003*** (9.19)
Household expenditure at village mean	−0.001 (1.24)	0.001 (0.59)	−0.031 (1.14)	0.038*** (4.58)
Number of children at working age	−0.010** (2.20)	−0.010 (1.52)	−0.499*** (3.13)	−0.030 (0.60)
Constant			−15.477*** (5.59)	0.282 (0.33)
Observations	13598	13598	13598	13598
Pseudo R-squared	0.12	0.09	0.07	0.04
Log likelihood	−4296.65	−8538.31	−8494.70	−26,805.94

Notes: Robust z statistics in brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%.

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levels do not appear to have a significant impact on off-farm labour-market participation, they are estimated to be a significant determinant of the amount of time spent in such activities, suggesting that, in wealthier communities, it will be easier to sustain such enterprises.

As the opportunities open to the offspring of the household heads are likely to be quite different from those available to their parents, looking at their employment choices will help to explain some of the underlying determinants of off-farm employment more clearly, even though this comes at the cost of not being able to observe agricultural ability of the individuals concerned. Results of doing so, as reported in Table 7.4, provide a number of additional insights and have greater predictive power (as illustrated by higher R^2 values) than the ones obtained for household heads.

First, we find that migration provides opportunities for the poor, as evidenced by the fact that most children who migrate come from households with low land and asset endowments. The fact that the propensity to migrate peaks at an age of about 30 is consistent with the hypothesis of an inter-generational phenomenon. A second finding of interest is that, in line with our hypothesis, a minimum level of non-agricultural assets appears to be needed in order to participate in local non-farm employment but not for migration; in fact, it is clearly those with lower levels of non-agricultural assets who tend to migrate, everything else being constant. Third, minimum educational qualifications for joining the non-farm sector and for migration are higher for the dependants of each head than for the heads themselves. Consistent with a significant expansion of education during the past few decades, even migration now seems to require some minimum amount of human capital. At the same time, the different signs of village-level income suggest that migrants are more likely to come from poor villages, whereas participation in non-farm activity is supported by a minimum level of economic development and wealth at the local level. Finally, the positive coefficient on the number of siblings at working age illustrates that households with larger labour endowment are more likely to engage in migration as well as off-farm activities. This could be due to greater pressure to explore alternative sources of income in large households, greater flexibility and the associated possibility to share risk within the household, or the ability to draw on migration networks in an effort to increase the success probability of such a step.

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Table 7.4 Probit and tobit regression coefficients of determinants of children's participation in migration and local non-farm employment

	Probit models		Tobit models	
	Participation in migration	Participation in local off-farm employment	Months of migration	Months working in local off-farm labour market
Owned land per capita	−0.004*** (3.84)	−0.006*** (4.42)	−0.152*** (4.18)	−0.170*** (7.38)
Value of agricultural assets (log)	0.009*** (4.25)	−0.006** (2.29)	0.249*** (3.63)	−0.175*** (4.10)
Value of non-agricultural assets (log)	−0.007*** (4.01)	0.004** (1.99)	−0.260*** (4.99)	0.058* (1.72)
Education obtained by children older than 13	0.118*** (23.16)	0.144*** (29.93)	4.128*** (21.68)	3.158*** (27.13)
Children's education squared	−0.006*** (19.58)	−0.008*** (23.67)	−0.218*** (18.49)	−0.153*** (21.01)
Average age of children older than 13	0.065*** (3.74)	0.115*** (8.10)	2.549*** (10.97)	2.455*** (16.75)
Children's age squared	−0.001*** (3.36)	−0.002*** (6.12)	−0.047*** (10.33)	−0.039*** (13.71)
Education obtained by head	−0.001 (0.19)	−0.019** (2.44)	0.060 (0.34)	−0.285** (2.43)
Head's education squared	−0.000 (1.07)	0.000 (0.65)	−0.018 (1.54)	0.006 (0.78)
Head's age	0.022*** (2.91)	0.033*** (4.52)	0.759*** (4.75)	0.673*** (6.55)
Head's age squared	−0.0002*** (2.82)	−0.0003*** (4.65)	−0.007*** (4.88)	−0.007*** (7.33)
Household expenditure at village mean	−0.003*** (3.81)	−0.000 (0.45)	−0.092*** (3.55)	0.034** (2.05)
Number of children at working age	0.099*** (15.38)	0.151*** (17.33)	4.858*** (25.82)	5.162*** (40.35)
Constant			−81.525*** (18.91)	−66.985*** (24.31)
Observations	10,416	10,416	10,416	10,416
Pseudo R-squared	0.24	0.35	0.10	0.13
Log likelihood	−5214.36	−4606.38	−18,000.26	−23,639.81

Notes: Robust z statistics in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

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Land-market participation

Tables 7.5 and 7.6 report results from equations for renting-in land and supplying land to the rental market. The most remarkable result, which adds significantly to the existing literature, is that higher levels of migration at the village level lead to an increase in the activity of the land-rental market, on both supply and demand sides. Non-farm employment, while having less impact on the propensity to rent-in land, has a significant impact on the household's propensity to rent-out and on the area that was rented out. In addition, we empirically confirm that land-rental markets make a significant contribution towards higher levels of productivity and transfer land to land-poor, younger producers. We discuss results separately for renting-in and renting-out.

Renting-in

Our results support the hypothesis that rental markets shift land towards those with higher levels of farming skills, irrespective of the specification chosen. To give an illustration of the order of magnitude, we note that, based on the coefficients in Table 7.5, the most-able farm producers in the sample are about 32% more likely to rent-in land than the least-able ones. This is consistent with earlier findings from China (Deininger and Jin 2002) and other countries (Deininger et al. 2003b). In a separate set of regressions (not reported), we added the interaction terms of farming ability and provincial dummies and dropped the linear farming ability term. Results show that the efficiency-enhancing effect of rental markets is robust across provinces, as the interaction term is positive and significant at 1% for 18 of the 19 provinces, the sole exception being Gansu.

While this might suggest that emergence of efficiency-enhancing markets could still be wealth biased and thus possibly hurt poor households, we do not find evidence of this. Neither non-agricultural wealth nor the level of education attained by the head has a significant role in enabling households to gain access to land. Hence, with the possible exception of access to agricultural assets, land-rental markets do not have any inherent wealth bias. On the contrary, our results suggest that land-rental markets improve access to land by the land-poor and can thus be understood as contributing to greater equity. The only exception is that, according to our results, rural households with draft animals and agricultural assets are more likely to rent land-in, suggesting that indeed a minimum level of agricultural equipment will be needed. Land markets thus appear to provide a means for smallholders to increase their holdings, and, with the passage

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Table 7.5 Probit and tobit regression coefficients of determinants of participation in renting-in and area rented-in

	Probit (participation)		Tobit (area rented in)	
	Base model	Expanded model	Base model	Extended model
Agricultural ability	0.160*** (11.41)	0.157*** (9.55)	3.294*** (13.73)	3.225*** (13.43)
Owned land per capita	−0.011*** (9.28)	−0.011*** (5.10)	−0.085*** (5.38)	−0.085*** (5.41)
Own draft animal	0.057*** (6.41)	0.058*** (3.77)	1.028*** (6.41)	1.048*** (6.54)
Value of agricultural assets (log)	0.007*** (3.54)	0.006 (1.62)	0.098*** (2.92)	0.095*** (2.83)
Value of non-agricultural assets (log)	0.000 (0.27)	0.001 (0.32)	0.012 (0.51)	0.018 (0.75)
Education attained by head	−0.000 (0.05)	−0.000 (0.04)	−0.005 (0.06)	−0.005 (0.05)
Education attained by head squared	−0.000 (0.39)	−0.000 (0.34)	−0.001 (0.10)	−0.001 (0.12)
Head's age	0.012*** (4.12)	0.013*** (4.50)	0.141*** (2.88)	0.167*** (3.37)
Head's age squared	−0.0002*** (4.83)	−0.0002*** (5.07)	−0.002*** (3.74)	−0.002*** (4.11)
Share of households migrating in the village	0.039*** (2.66)	0.060*** (3.04)	0.389 (1.40)	0.823*** (2.78)
Share of households working in the local off-farm labour market in the village	−0.003 (0.26)	0.006 (0.23)	−0.259 (1.23)	−0.089 (0.39)
Household expenditure at village mean	−0.001** (2.04)	−0.001 (1.31)	−0.021* (1.67)	−0.018 (1.43)
Months out-migrating during the previous year		−0.003*** (3.67)		−0.056*** (4.65)
Months working in the local off-farm labour market during the previous year		−0.001 (1.22)		−0.027** (2.35)
Constant			−4.965*** (4.07)	−5.655*** (4.58)
Observations	13,598	13,598	13,598	13,598
Pseudo R-squared	0.05	0.05	0.02	0.02
Log likelihood	−7211.71	−7201.00	−14,558.61	−14,545.85

Notes: Robust z statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

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Table 7.6 Probit and tobit regression coefficients of determinants of supplying land to the rental market and area rented-out

	Probit (participation)		Tobit (area rented-out)	
	Base model	Expanded model	Base model	Extended model
Agricultural ability	−0.029*** (2.75)	−0.026** (2.46)	−0.761*** (3.71)	−0.696*** (3.39)
Owned land per capita	0.008*** (11.47)	0.008*** (11.59)	0.279*** (23.99)	0.280*** (24.11)
Own draft animal	−0.015** (2.16)	−0.016** (2.21)	−0.498*** (3.25)	−0.504*** (3.29)
Value of agricultural assets (log)	−0.000 (0.15)	−0.000 (0.02)	−0.013 (0.45)	−0.010 (0.33)
Value of non-agricultural assets (log)	0.001 (1.06)	0.001 (0.57)	0.026 (1.20)	0.015 (0.70)
Education attained by head	0.002 (0.46)	0.002 (0.54)	0.035 (0.44)	0.043 (0.53)
Education attained by head squared	−0.000 (0.04)	−0.000 (0.16)	−0.000 (0.01)	−0.001 (0.14)
Head's age	−0.004** (2.22)	−0.005*** (2.71)	−0.081** (1.98)	−0.097** (2.40)
Head's age squared	0.00004*** (2.86)	0.00002*** (3.25)	0.001** (2.50)	0.001*** (2.83)
Share of households migrating in the village	0.025** (2.12)	0.017 (1.37)	0.611** (2.36)	0.482* (1.74)
Share of households working in the local off-farm labour market in the village	0.065*** (7.23)	0.052*** (5.46)	1.435*** (7.17)	1.152*** (5.43)
Household expenditure at village mean	0.001* (1.87)	0.001 (1.54)	0.027** (2.46)	0.024** (2.19)
Months out migrating during the previous year		0.001*** (2.82)		0.026** (2.48)
Months working in the local off-farm labour market during the previous year		0.002*** (4.12)		0.041*** (4.08)
Constant			−7.209*** (6.78)	−6.811*** (6.41)
Observations	13,598	13,598	13,598	13,598
Pseudo R-squared	0.05	0.05	0.05	0.05
Log likelihood	−5281.50	−5270.62	−8862.98	−8852.68

Notes: Robust z statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

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of time, possibly help to undertake initial investments or to gradually consolidate holdings. We also note that, by shifting land from older to younger producers, rental markets may contribute to the process of structural change. A key contribution of this paper is the ability to link participation in land markets to labour-market participation. Using information from the set of sample households in each village (and excluding the household under concern) we find that a higher share of out-migration does indeed allow those remaining to gain access to land through rental markets. No such effect can be discerned for local non-farm employment, in line with the hypothesis that such activity will still allow those engaging in a job off the farm in the local labour market to cultivate their agricultural land. Even though the variable may be subject to endogeneity concerns, adding past participation in migration and local non-farm employment at the household level leads to a similar result: households that participated in migrant labour markets in the past are less likely to rent-in land, whereas past participation in local off-farm labour is not seen to have any impact on land-rental participation but decreases the amount of area demanded.

Supply of land to the rental market

In many respects, and consistent with our hypotheses, the regressions for renting-out are nearly mirror images of those for renting-in. We note in particular that those with higher levels of agricultural skills are less likely to rent-out, although the magnitude of the coefficient is much smaller than in the case of renting-in. Higher levels of land ownership are predicted to increase the propensity of supplying land to rental markets, confirming the redistributive character of land rental. With the exception of a dummy for ownership of draft animals, which is negative, none of the other indicators for endowments of physical and human capital emerge as significant determinants of supplying land to the rental market.

Again, and similar to what emerged for renting-in, levels of migration and off-farm labour-market participation at the village level emerge as highly significant determinants of supplying land to the rental market. This supports the view that, as the rural non-farm economy gathers strength, well-functioning land-rental markets will be essential to not only bringing scarce factors of production to their best use but also to helping expand the economic opportunities of those who, for various reasons, choose not to join the non-farm labour force. The link between activity in labour and land-rental markets found here is likely to be of policy relevance beyond China, especially for countries such as India or Ethiopia that have historically imposed restrictions on

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the functioning of land-rental markets, thereby increasing the cost of migration for those who own land. This may imply that it is no longer those with the low agricultural ability who move out, thereby reducing or even counteracting the potentially positive impact of migration on the source economy, either reducing the scope for start-up of non-farm enterprise (Deininger et al. 2003a) or leading to migration as a coping strategy by those lacking land access (de Haan 2002; Rogally 2002).

CONCLUSION AND POLICY IMPLICATIONS

In view of its rapid recent pace of economic growth, China provides an excellent example to study the implications of a large-scale transition of the labour force from the agricultural to the non-agricultural sector. Exploring determinants of the household's decision to participate in labour markets allows us to demonstrate not only that those with lower endowments of human capital and physical assets will be forced to join the migrant labour force while those who have some assets or live in wealthier provinces can establish non-farm businesses or obtain local wage employment, but also to show that it is indeed those with lower agricultural ability who are most likely to join the non-agricultural labour force. This implies that operation of land markets can, by transferring land no longer used by households who have taken up non-agricultural employment, provide gains not only in efficiency but also in equity. Our empirical analysis allows us to substantiate this claim by showing that it is indeed the more-productive and land-poor producers who gain access to land through rental markets. We also demonstrate that higher levels of migration and local non-farm employment are important factors that help to activate land-rental markets. The emergence of land markets, then, can set in motion a process of greater agricultural productivity which, especially if complemented with productivity-enhancing public investment, can help to narrow the income gaps within and across provinces that have recently become the subject of much concern by policy makers.

While the empirical evidence allows us to identify a number of promising signals, it also points towards two topics which cannot be resolved within the context of this study but which could provide valuable insights for both research and policy. First, throughout our analysis, we have treated property rights to land as exogenously given and essentially constant over time. Given that, since the adoption of the household responsibility system in the late 1970s and early 1980s, there has been a continuing, though regionally uneven, process towards better definition of property

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rights that has culminated in the passage of the 2003 Rural Land Contracting Law, this assumption clearly involves a gross simplification. Although there is agreement that more-secure property will encourage land-related investment and productivity-enhancing land transfers, we know of no recent empirical studies that explore the extent to which measures that enhance tenure security are adopted in response to such economic opportunities. In fact, the views of experts on the topic differ markedly. At the one extreme, it is assumed that measures to increase security of property rights will more or less automatically emerge once conditions are right, and all that is required from policy makers is to help establish an environment where the obstacles to such an organic evolution are minimised (Platteau 2000). On the other hand, there is a more 'interventionist' school that departs from the assumption that exogenous interventions to increase the security of property rights in a more discontinuous fashion can make an independent contribution to jump-start investment and the emergence of land as well as possibly financial markets.

Given the fundamental role of property rights in any society, the potentially high cost of interventions (such as cadastres and registries) to improve the security and transferability of such rights, this is obviously an issue of high policy relevance. Although it clearly transcends the scope of this study, using variation in institutional arrangements on security of land rights and functioning of land and labour markets, before and after the passage of the Rural Land Contracting Law, could well help to provide insights into this phenomenon that would be of great interest to students of institutional change.

A second area where further research may be rewarding relates to the extent to which markets can set in motion a dynamic of their own, rather than just leading to an efficiency-enhancing redistribution of endowments within the economy. In international comparison, it would be of considerable interest to explore to what extent the beneficial equity and efficiency effects associated with the operation of land markets come about because of the relatively equal distribution of cultivated land among China's rural households. In the context of China, while our results highlight that markets work in the 'right' direction, they do not indicate to what extent better functioning of labour and land markets can help to increase rural incomes sufficiently to narrow what is perceived as an ever-widening gap between rural and urban areas in terms of household welfare. To arrive at an answer to this question, further information on the nature and direction of technical change in rural areas and of economic growth in urban areas will be required. Given the obvious relevance for policy, more in-depth study of this issue may well be of interest, especially in the context of China's

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WTO accession. The results of such study are likely to provide important insights on policies to improve rural productivity and the functioning of land and labour markets, and to reinforce the importance of such markets.

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APPENDIX 1

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Table 7.A1 Key differences in migration and rental market activity across provinces

	Share of households		Percentage of income from			Households		Months				
	Renting-in (%)	Renting-out (%)	Agricultural production (%)	Wages (%)	Self-employment (%)	Self- employed (%)	Migrating (%)	Months migrated (number)	Months off-farm (number)	Land endowment (Mu/per cap.)	Rental ratio[a]	No. of households
North & northwest	**7.1**	**4.9**	**38.2**	**33.7**	**28.1**	**7.3**	**25.4**	**2.3**	**8.3**	**2.14**	**0.48**	**12390**
Hebei	6.4	3.5	37.7	35.5	26.8	9.0	23.1	2.3	10.3	1.78	0.48	4200
Shanxi	5.0	4.8	33.7	35.8	30.5	5.0	13.1	1.1	6.8	2.23	0.43	2100
Liaoning	12.0	7.0	42.8	27.7	29.5	6.0	19.6	1.7	7.4	2.95	0.51	1890
Henan	7.5	3.5	48.1	26.3	25.6	9.0	37.9	3.5	8.1	1.51	0.43	4200
Coastal region	**9.4**	**8.8**	**27.9**	**41.5**	**30.6**	**14.4**	**35.4**	**4.5**	**13.7**	**1**	**0.59**	**14680**
Jiangsu	3.8	6.2	26.5	49.6	23.9	14.0	32.5	3.3	12.9	1.14	0.54	3400
Zhejiang	13.7	16.6	17.8	43.0	39.2	20.0	27.3	3.4	16.2	0.80	0.85	2700
Fujian	13.4	10.5	25.1	33.7	41.2	14.0	37.4	4.7	15.3	0.62	0.81	1820
Shandong	6.8	4.7	42.1	28.9	29.0	14.0	27.5	2.6	9.0	1.44	0.35	4200
Guangdong	13.4	8.8	25.3	49.5	25.2	10.0	56.5	8.8	14.5	0.73	0.56	2560

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	Share of households		Percentage of income from			Households		Months			
	Renting-in (%)	Renting-out (%)	Agricultural production (%)	Wages (%)	Self-employment (%)	Self- employed (%)	Migrating (%)	Months migrated (number)	Months off-farm (number)	Land endowment (Mu/per cap.)	Rental ratio[a]	No. of households
Central region	**10.4**	**5.1**	**40.5**	**34.1**	**25.4**	**11.1**	**47.0**	**5.4**	**9.2**	**1.31**	**0.50**	**14860**
Anhui	9.4	3.8	43.8	35.4	20.8	8.0	51.5	5.7	10.1	1.42	0.42	3100
Jiangxi	18.7	6.9	38.6	47.0	14.4	11.0	56.5	6.7	11.3	1.19	0.53	2450
Hubei	7.3	4.2	45.8	29.0	25.2	12.0	43.1	5.8	9.5	1.38	0.66	3300
Hunan	11.8	7.4	29.4	39.1	31.5	15.0	45.7	4.7	8.4	1.06	0.47	3700
Guangxi	11.6	6.9	36.1	30.8	33.1	12.0	37.8	4.5	6.8	1.23	0.53	2310
Southwest and northwest	**7.5**	**5.7**	**40.5**	**27.2**	**32.3**	**9.2**	**37.5**	**3.6**	**7.6**	**1.37**	**0.44**	**12660**
Sichuan	7.4	6.9	33.2	33.9	32.9	8.0	50.8	5.7	9.3	0.99	0.39	4000
Guizhou	8.0	3.5	42.2	21.9	35.9	13.0	29.3	3.5	6.4	1.06	0.51	2240
Yunnan	7.5	3.3	47.1	14.5	38.4	8.0	19.9	1.5	5.0	1.39	0.39	2400
Shaanxi	11.7	11.3	41.6	32.6	25.8	9.0	41.9	3.5	8.6	1.61	0.53	2220
Gansu	2.9	2.3	47.1	26.8	26.1	9.0	39.2	2.8	8.2	2.12	0.24	1800

Source: Computation from China National Bureau of Statistics 2001 Household Income and Expenditure Survey.

[a] The rental ratio is defined as the share of the land rented in over owned land. It is reported here only for households which are renting-in.

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APPENDIX 2 — DERIVATION OF THE MEASURE OF HOUSEHOLDS' ABILITY

We assume the crop-production function is Cobb-Douglas:

$$Y_{ijt} = \exp(\alpha_i + \alpha_j) A_{ijt}^{\delta_1} L_{ijt}^{\delta_2} K_{ijt}^{\delta_3} \quad \text{(A1)}$$

where Y_{ijt} is total crop output produced by household i in village j in year t; A_{ijt}, L_{ijt} and K_{ijt} are the land, labour and capital used to produce this output Y_{ijt}, and δ_1, δ_2, and δ_3 are technical coefficients. The term $\exp(\alpha_i + \alpha_j)$ is our efficiency parameter which consists of household- and village-specific elements. While we do not know exactly what is embodied in the efficiency parameter, it likely reflects such factors as differential access (of farm households and groups of farm households in their villages) to infrastructure and markets, soil quality and climate. Taking logs of both sides of equation (1) and adding a time trend and an *iid* error term, and letting $\alpha_{ij} = \alpha_i + \alpha_j$, we obtain an estimable equation for the relationship between inputs and outputs of the production relations of household i in village j at time t:

$$y_{ijt} = \alpha_{ij} + \delta_1 a_{ijt} + \delta_2 l_{ijt} + \delta_3 k_{ijt} + \phi t + \varepsilon_{ijt} \quad \text{(A2)}$$

where the lower-case letters refer to the logarithm of the quantities referred to above. The availability of two observations per household in our panel for our sample households allows us to estimate equation (2) using household fixed effects,

$$y_{ijt} - \bar{q}_{ij} = \alpha_{ij} - \bar{\alpha}_{ij} + \delta(Z_{ijt} - \bar{Z}_{ij}) + \phi(t - \bar{t}) + \varepsilon_{ijt} - \bar{\varepsilon}_{ij} \quad \text{(A3)}$$

where Z_{ijt} is a vector consisting of a, l and k and δ is a vector of coefficients. In addition to land and household labour use in agricultural production, Z_{ijt} also includes the aggregate value of material inputs, such as chemical fertiliser, pesticides and seeds. Fixed capital is the value of all assets that are used by the household for crop production. Since the survey did not report values for draft animals, we include a dummy indicating whether or not the household owned a draft animal. After estimating equation (3), we can recover the composite efficiency parameter α_{ij}, which includes both household and village effects. Since we ultimately want to get a measure that includes only household effect, we apply a similar procedure at the village level to obtain α_j which measures just village-specific effects. Our estimate of the pure, household-specific idiosyncratic effect, α_i, for each can be obtained by subtracting the estimated village effect, α_j, from the estimate of joint village-household effect, α_{ij}.

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CHAPTER 8

FINANCE FOR RURAL DEVELOPMENT

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8.1 EXPANDING FINANCE OPTIONS FOR RURAL DEVELOPMENT

CCICED ARD Task Force members

THE PLACE OF FINANCE IN RURAL DEVELOPMENT

Availability of credit facilitates development; it is not a determinant of development. Development is an outcome of entrepreneurs, in business and in farming, who exploit opportunities to employ new resources, combine resources with emerging technology to produce new products, or combine resources to build new markets for existing or new goods and services. To make these changes, entrepreneurs in business and farming require access to sources of finance. The availability of credit can facilitate such entrepreneurial initiatives.

A common characteristic of successful development is a transition from a rural, agriculture-based economy to a more urban, industry-based economy. The development of labour markets and access to off-farm jobs are means to achieving this transition. Therefore, addressing credit constraints to agricultural development needs to include finance for the creation of off-farm employment in villages and towns as well as finance for on-farm activities. When families move from the countryside to the city, they also need access to financial resources to do so. Given China's enormous challenge of creating hundreds of millions of jobs over the coming years, China needs to develop a solid rural-financial system.

For farm households it is important also to recognise that immediate, short-term credit needs may well arise from family emergencies or spending expected for important life-cycle events—birth, marriage and death—within a family. In typical

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small-farm households there often exists a need for credit to meet both the family's consumption and production needs. It is credit sought under the latter that will lead to productive investments with some probability of success. Income transfers obtained from kin, especially to address 'surviving economy' needs, are typically not seen as credit, but they are important. In many successful developing countries, there are many sources of rural finance, formal and informal.

Likewise, the rural financial system also plays in important role in providing rural households a safe place to make deposits. In many rural settings and for many households, even in prosperous areas, there are not necessarily always good projects with high returns. In such cases, farmers value access to a rural credit system that will allow them to invest some of their funds safely at a positive interest rate. A good rural financial system will lend such funds to those with good projects and in need of funding.

LIMITATIONS OF THE CURRENT RURAL FINANCIAL SYSTEM IN CHINA

In China there are three formal rural credit sources: Rural Credit Cooperatives (RCCs), the Agricultural Bank of China (ABC), and the Agricultural Development Bank of China (ADBC). As of 2001, loans extended in China were 11,200 billion yuan, of which agricultural loans accounted for 570 billion, or 5%. Loans to township and village enterprises (TVEs) were 640 billion yuan, an additional 6%. Even if loans by the ADBC for the procurement of agricultural products are added, the support for agriculture and rural industrial development accounts for only 17% of loans nationwide.

The role of the ABC in rural finance is declining. Before the mid 1980s, 98% of its loan portfolio was located in the countryside. From the mid 1980s to the early 1990s it adjusted the structure of credit, using 60% of its 'agricultural' credit to support the purchase of agricultural by-products and to develop TVEs. After the mid 1990s, as progress in commercialisation reform of the ABC quickened, the allocation of its financial resources was no longer limited to agriculture and the countryside as its support for rural power grids, transport and communications increased. After the 1990s, its institutional network gradually withdrew from the countryside, the rate of growth of agricultural loans eased, the ratio of take-up began to fall and business

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was sought increasingly in cities and with industry. Currently, agricultural loans account for only 10% of ABC's loan portfolio. One of the main problems faced by ABC management in making loans in rural areas is that loans are small and interest rates heavily regulated. Furthermore, many policy measures make it difficult for rural customers to come up with collateral for loans.

With this substantial cutback by the ABC in rural finance, the RCCs have become the main source for agricultural loans. Although RCCs are formal financial institutions that directly cover a vast area of the countryside with an extensive network, their provision of loans to small-farm households is limited. Only 25% of smallholders nationwide have obtained a RCC loan. Further, the proportion of RCC loans for agriculture has declined from 46% in 1990 to 34% in 2000—although in recent years new government programs have increased the flow of funds to rural areas. As major commercial banks, one by one, withdraw from the countryside, dependence solely on the strength of credit available from the RCCs will by no means be adequate to resolve difficulties in obtaining loans by farmers and small-business entrepreneurs in towns and villages. An additional concern is the high proportion of bad debts (estimated at 37%) held by Chinese rural-finance institutions. As they lack an equivalent capital base to cover these bad debts, their commercial viability is not assured.

Informal credit is widespread in rural areas. The main channel through which farm households borrow is private loans. It is estimated that between 50 and 60% of farm households have obtained informal loans accounting for at least 70% of total funds borrowed. This is commensurate with TVEs that seek high-interest financing through popular channels. The existence of informal credit also suggests several other characteristics of the rural financial system. First, there is unmet demand by the formal credit system. Second, although being unregulated may enhance access to credit in some cases, if it is possible to allow for informal lenders to become more formal without impeding their ability to lend (or if it is possible to allow the entry of more formal lenders that will service the part of the economy being serviced by the informal sector), the overall rural financial system might be strengthened.

It is fair to say that, even though for more than a decade reformers have tried to reform the banking sector in rural China, the nation still faces most of the common problems faced by other developing countries. The rural economy faces poor financial intermediation. There are large flows of funds out of the region. Recent

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studies show China extracted a total value of about 1289 billion yuan (in 2000 prices) of capital from the agricultural sector for use in the nation's industrialisation between 1980 and 2000. Nearly twice as much, about 2297 billion yuan, flowed from the rural sector to the urban economy during the same period.

REMAINING CONSTRAINTS AND ENABLING FACTORS

In 1998, the National People's Congress identified financial-system reform, including decentralisation and commercialisation, as one of five priorities. This process is now well under way, although the reach into rural areas, especially in western China, is still limited. Current initiatives include decentralising RCCs to the provincial level. In addition, the People's Bank of China initiated a program in 2001 to encourage RCCs to develop micro-finance options. There is some evidence of pay-off from this initiative in that RCC loans to small-farm households more than doubled during 2002.

Another encouraging development is experiments with both unofficial and informal approaches to credit delivery. With administrative supervision from the Ministry of Agriculture, Rural Cooperative Funds have emerged at the township level. As they cannot accept deposits, they facilitate borrowing by farmers and TVEs, by drawing on funds obtained from share capital. Local governments, non-governmental organisations and a number of international donors are experimenting with various approaches to micro-finance.

Nonetheless, significant barriers to financial market reform remain in rural areas:

- Interest rates remain regulated, which rations credit and limits access by small borrowers and depositors. Given the high administrative costs of maintaining a large portfolio of small loans, the band of interest rates allowed by the People's Bank of China is still too low to permit earnings that provide competitive returns on a rural lending institution's assets and equity. Commercial sustainability therefore remains problematic. The regulated interest rates also distort resource allocation, inviting misallocation and rent-seeking, and—because real interest rates are negative in years where significant inflation occurs—they

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reduce incentives to hold savings in a financial form. The effect of this has been limited expansion of financial services to meet demand from emerging entrepreneurs in small businesses and on farms.

- With limited opportunities to deposit savings in many rural areas, households primarily hold their wealth—an estimated 83%—outside the banking system. Savings are held in the form of housing, cash, grain and fixed assets. For pastoralists it is livestock. They view their herds of animals as their 'bank'. The animals are a form of saving that can be turned into cash when needed. They also represent various forms of insurance to meet emergency needs for cash in times of illness, accident, unemployment or death. While rural households will always keep some of their wealth in these real assets even though many are unproductive (e.g. holding grain stocks that exceed one year's consumption), from a national development point of view, there is scope for increasing savings rates.
- Subsidised credit has been used extensively as an approach to poverty reduction. As this micro-credit is offered with the intent that the poor households will graduate to an income level where they will be served by existing financial institutions, the programs make no attempt to build institutions and sustainable micro-finance programs. As a result, alternative approaches to delivering rural finance based on market interest rates have difficulty competing with this welfare delivery program. The net effect is stunted development of financial services in rural areas, especially in poverty-designated counties.
- Formal lending practices are typically based on collateral. Farmers find it difficult to meet these collateral conditions as they do not own their land and markets for land-use rights are only just beginning to emerge. In Vietnam, land-use rights titles are used to secure loans; after titling, lending to farmers increased sharply. Alternative lending practices need to be considered: informal appraisal of borrowers and investments, access to repeat and larger loans based on repayment performance, and collateral substitutes such as group liability, compulsory savings or some form of guarantee.

While all of the above problems pose a challenge to reformers, many observers believe that by far the biggest problems in the rural financial system are in the ownership and lack of competition in the sector. Until managers, boards of directors or other players are directly responsible for (and are rewarded by) the growth in bank assets, lending will always be more political than economic. Today no one is interested in building healthy portfolios because there is little incentive to do so. Frequently, rules

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are set up so rigidly that entrepreneurship and creative credit policies are dampened. In addition, without free entry of banks, competition is lacking. Research by China's economists has demonstrated that, in almost every case where there is competition, the quality of the portfolio and the profitability of the lender rises.

POLICY OPTIONS FOR REFORMING THE EXISTING FINANCIAL SYSTEM

Rural financial reforms have not kept pace with growing demands for banking services to facilitate a continued economic transition in rural areas. A fundamental resolution of current problems in Chinese rural finance cannot be confined to minor repairs and adjustments to the existing rural financial system. It is necessary to have the system as a whole in mind and again perform functional reorientation and adjustment of the ABC, the ADBC and the RCCs with an aim of establishing a more-complete and vigorous rural financial system.

Reforming Rural Credit Cooperatives

First, a solution should be found to common problems in RCCs: unclear proprietary rights, incomplete legal administration, comparatively low levels of management, and a lack of effective inspirational mechanisms and control of insiders.

Current demands put forward by central government in a call for reform of the RCCs include: property rights relationships should be clear, the mechanisms of restraint should be reinforced, service functions should be strengthened, and there should be appropriate state support; but local governments should be responsible. As a result of the differences between places throughout the country, it would obviously be inappropriate to compel RCCs to reform in line with a centralised model.

There are two schools of thought about this reform. One option is to reorganise each RCC branch into a joint-stock company. If business is reasonably good in developed areas it is appropriate to commercialise the running of credit unions in this manner. This structure localises proprietary rights with autonomous, independent management as its basis. No specialised legislation is required as joint-stock companies form part of the national banking legislation. Existing regulations and laws covering joint-stock companies would apply and would govern management and operation of such financial institutions.

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The second option is to reorganise RCCs in a stratified form. Drawing lessons from the successful experience with the development of cooperative banking abroad, branches of the RCC can be changed into truly cooperative financial organisations. These cooperative banks would be owned by those residents of a community who chose to become members. The intent is a non-profit association that operates as a commercial enterprise without interference from local government officials. Alternatively, current RCC branches within a province could be changed into a grass-roots network of the ADBC with policy-related loans as their main business. This variation of the second option is mainly suitable for areas where the level of economic development is rather low, and whose residents lack the knowledge and skills needed of risk management and other financial operations.

Whichever type of organisational form is adopted, it is essential that problems of unclear proprietary rights and poor legal administration be resolved. Only in this way can there be a solution to the problem of governments carrying final, overall responsibility for the bad debts of RCCs. In other words, although the long-term solutions are complex and must be implemented gradually, there is still scope for beginning by focusing on more immediate, less-comprehensive reforms. We believe China can and should begin to experiment with issues of how to raise the short-run supply of credit locally in order to attempt to increase farmer incomes and promote production activities and that this may help gain experience in solving some of the longer-term problems (such as the property rights of banks, the emergence of small and medium private banks and managerial and governance reforms of the state-owned commercial banks).

In conducting experiments, we believe China may want to take a regional approach. Because the demand for credit varies among regions, and because the institutional capacity of the banking system is so different in each part of the country, banking officials should be able to conduct experiments in coastal, central and western areas. The most important reforms invariably will happen in the coastal areas, since China's drive to establish a modern banking system must start in the most-advanced areas. The overall goals should be to abolish policy constraints and foster competitive rural financial markets. In the near future, private banks should be allowed to emerge in some areas and their effect on the financial system should be assessed carefully.

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More flexibility with interest rates

A second issue that needs to be addressed is the problem of controls on interest rates. The negative effects brought about by these controls are not only a distortion to the price of using funds and irrationality in the allocation of financial resources, the level of earnings by commercialised financial institutions in the rural financial market is also affected. Strict enforcement of official interest rate restrictions will prevent the development of micro-finance programs and the RCC system. The floating of interest rates on a large scale should be realised on the basis of market demand, with interest rate controls gradually relaxed so that the demand for commercialised financial institutions to carry on financial activities in the rural financial market can be met. Because financial markets are so interlinked, it is not going to be possible to liberalise deposit rates until deposits in the whole system are liberalised but, in the future, this also should be a goal. In other Asian countries, raising deposit rates induced massive savings and helped the poor more than did the extension of new loans.

Improving supervision

A third issue is the lack of an effective supervisory framework. Successful operation of all financial institutions requires public confidence. An environment that builds public confidence includes: (a) well-defined laws and procedures that govern the accounting, auditing and reporting requirements for all financial institutions; and (b) a stable, growing economy that enables small entrepreneurs to undertake new ventures and to sustain the profits required for loan repayment and the provision of local employment while producing the goods and services in demand in the community. To create such an environment, there is a need to establish an effective supervisory framework that will enhance ideas about supervision, improve supervisory technology and raise the quality and efficiency of supervision. This framework will include means to inspect and to enforce relevant regulations and laws.

EXPANDING RURAL FINANCIAL OPTIONS

One of the most effective strategies used by reformers in their management of China's transition to a 'socialised market' is a focus on competition within the market. This addresses the problems associated with state-owned enterprise through growth of a non-state sector, reducing the role of the former and assuring competition within the

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market. Extending this approach to a market transition to rural finance calls for a policy shift that allows locally owned alternatives to emerge as competition for a reorganised RCC, ADB and ADBC system. Competition will extend the reach of these existing financial institutions and will spawn innovation in the delivery of financial services.

There are many options. RCCs can be privatised and allowed to set up branches in other counties. Private banks can be allowed to emerge. Foreign banks should be encouraged to participate in rural areas. In addition, a Rural Savings and Credit Association, patterned somewhat on credit unions in other countries, is also recommended as a model. This model can provide a legal basis for the unofficial and informal credit institutions and programs evident in rural China. A starting point for a Rural Savings and Credit Association will be either an existing affinity group or the creation of affinity groups to meet the condition of offering financial services to members only. In most cases, the organisation would be based locally and would be focused on servicing the needs of those within the community. Ideally, each affinity group would constitute a local informal network that can facilitate assessment of the suitability of clients who have applied for loans.

As low-income households typically cannot offer full collateral, knowledge of the client serves as the basis for initiating a ladder approach to developing a credit history—initial small, short-term loans for consumption, moving up to larger loans for investment purposes. Co-insurance of loans may be considered in the form of group lending, which draws in members of an extended family. A Rural Savings and Credit Association option will require regulatory and legal changes that will enable micro-finance programs to operate on a financially sustainable basis. To make such changes, the China Banking Regulatory Commission will need to clarify definitions of property rights relationships and, where necessary, advance legislative changes to assure the transparency and accountability required for the development of sound savings–credit institutions. If successful, this would likely displace part of the informal sector and would allow for more regulation and control over this part of the rural financial system.

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ENCOURAGING MICRO-FINANCE

In the final analysis, even if the rural financial reforms were successful and a more functional, wider-ranging rural financial system were operating, in an economy such as China's there will still be those who will not be serviced by the more liberalised sector. In most cases, those excluded will include the poor, members of minority groups and those who live in deep and isolated regions of China. These people, despite their poverty and remoteness, have demand for credit and deposit services. To serve these needs, we strongly urge that China continues to allow experimentation with micro-credit programs. International and domestic groups should be encouraged to set up peer-monitoring and other innovative programs that target the poor. Local government micro-credit schemes have been less successful and though their efforts should continue to be encouraged, the role of non-government organisations should also be recognised and efforts made to reduce local governments and financial organisations regulating and interfering with them.

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8.2 RURAL FINANCE OPTIONS TO PROMOTE SUSTAINABLE AGRICULTURE DEVELOPMENT AND ALLEVIATE RURAL POVERTY IN CHINA

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RURAL FINANCE AND RURAL DEVELOPMENT

The development of rural China will require significant injections of financial resources. Addressing the many important issues involved is larger than the scope of this paper. Rather, the purpose of the paper is to address that sub-set of rural finance issues that can affect low-income households—farmers and small businesses—located primarily in the provinces covered by China's Western Economic Strategy. The goal is to advance sustainable agriculture and promote rural development in these regions in a manner that will alleviate poverty and promote a more equitable distribution of income within China.

The approach of the paper is to describe briefly the existing formal financial system serving rural areas and to identify the limitations of this system as a provider of deposit and lending services for lower-income households. The proposed solutions include reforming the existing formal financial system plus facilitating and promoting the evolution of new institutions. The generic alternative presented is intended to increase access of lower-income rural households to financial services and to increase competition in rural areas in the delivery of a range of formal financial services.

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It is a premise of this paper that the success of the proposed rural-finance development will depend on a simultaneous evolution of other complementary activities as presented in this monograph:

- appropriate advances in agricultural research and extension and innovations in grain storage and marketing to affect changes in farming practices, technology utilised and commodities produced (Chapter 2 and Chapter 6)
- re-definition of property rights for land in a manner that promotes more efficient use of land by providing increased incentives for farmers to make longer-term investment decisions and to enhance access to credit from existing institutions within the rural financial system (Chapter 7)
- fiscal reform to reduce the fees and taxes paid by farmers and to change the extent and nature of public goods and services provided for farmers (Chapter 1)
- full exploitation of the green and amber box provisions for agriculture within China's World Trade Organization commitments to advance the opportunities for and capabilities of small farmers (Chapter 3)—as Han (2003) indicates, China has room within its World Trade Organization green and amber box provisions to expand expenditures to develop agriculture
- expansion of off-farm employment opportunities to provide greater access to scarce land resources for households that remain in farming, to expand demand for agricultural production, and to increase financial resources for investment in households that receive remittances from migrants (Chapter 5).
- development of new approaches for farmers to organise and cooperate to increase access to technology, extension and farm inputs, to expand processing, storage and marketing of farm output, and to access credit (Chapter 4).

RURAL FINANCE WITHIN CHINA'S FINANCIAL SYSTEM

The role of a financial system

Stiglitz (1998) describes a country's financial system as the 'brain' of an economy. Institutions that make up a financial system have two primary functions: first, to collect and hold savings from individuals, households and business firms who have

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an excess of resources at a stage in their life or operation; and second, to channel these savings as loans to entrepreneurs, including farmers, who can make productive use of these financial resources. The 'brain' element of the financial system is the process of selecting the most-productive entrepreneurs for the limited resources available, monitoring the use of the funds to ensure they continue to be used productively, minimising risk involved for savers and borrowers alike, and transmitting the information needed for all these transactions to occur expeditiously. A financial system that fails to carry out some or all of these functions limits the development of the economy.

Financial reform in contemporary China

In a press conference at the conclusion of the National People's Congress, Premier Wen Jiabao identified banking reform as an important economic issue that China must implement successfully (Gao 2004).

Rural financial reform is only one part of a much larger process of reform occurring as China's financial system evolves. While there has been something of a rural economic revolution—a rapid increase in agricultural production, growth of Township and Village Enterprises, and associated changes in the structure of the rural economy—'…rural financial reforms have not kept pace with actual and required further economic transition in rural areas' (Scott and Druschel 2003).

Primary institutions shaping rural finance

A powerful voice in shaping the evolution of China's financial system is the central bank, the People's Bank of China. Its approach to rural finance has been built around three existing institutions.

Rural credit cooperatives

At the official level, rural credit cooperatives (RCCs) are the primary providers of credit for farmers. In 2001, there were approximately 40,000 branch offices (sometimes also called credit unions), spread throughout China. According to He Guangwen (2003), this represents a considerable decline from approximately 55,000 RCCs in 1981. It is estimated the RCCs account for 12% of all deposits held in China (Zhang Hongyu 2003). Of its 1200 billion yuan loan portfolio, 37% was directed to agriculture, accounting for an estimated 78% of total agricultural loans from

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China's formal financial system (Han 2003). Entering this millennium, the People's Bank of China identified RCCs as the means to develop rural areas. The focus was a provision of credit, in the traditional sense, for farmers and small businesses. Extending financial services to low-income households in rural areas, until recently, has not been a priority development issue. The People's Bank of China initiated a program in 2001 to encourage RCCs to develop micro-finance options. Some 32,000 co-operatives report having established such a program, but micro-finance coverage in the rural areas remains low (Han 2003). There is some evidence that this initiative has expanded the credit available to peasant households. It is not a use of the financial system as a means to social engineering, such as empowering women, as articulated so well by the All China Women's Federation. Recent reforms include establishing RCC unions at the county and provincial levels and conversion of RCCs into provincial-level commercial banks (Scott and Druschel 2003). The need for reform remains strong, with 37% of the RCCs loan portfolio designated as bad debts in 2002 (Han 2003). In April 2003, the monitoring role of the People's Bank of China for RCCs was shifted to the China Banking Regulatory Commission.

Agricultural Bank of China

The Agricultural Bank of China (ABC) operates like a commercial bank, providing credit in rural areas. Of its 2001 loan portfolio of 1604 billion yuan, 54% was agriculture related (Han 2003; Zhang Hongyu 2003). Park and Changqing Ren (2001), in contrast, report only 14% of the ABC's lending was for agriculture. After the mid 1990s, with a move toward commercialisation of the ABC's operations, it now also finances rural infrastructure: power grids, transport and communications. Within China's financial system, government-based micro-finance is lodged primarily within the ABC. The government entrusted the ABC with responsibility for the micro-credit that forms a major part of the poverty-alleviation funds delivered as a form of welfare to poverty households. No collateral is required for these loans and interest rates are set at 2.88%. In government-designated poverty counties, poverty households are eligible for this form of credit. It is assumed—an assumption not formally tested or demonstrated in practice—that such credit must be subsidised to make it accessible to poor people. As welfare delivery is generally deemed to be a temporary program, there is no recognised need to create delivery institutions or worry about program sustainability. The poverty-alleviation loan funds channelled as a form of welfare through the ABC increased dramatically during the 1990s to 8.5 billion Yuan in 1997 (Park and Changqing Ren 2001). These funds served to

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reduce the number of families living in poverty, in part because timely repayment of these low-interest loans was approximately 50%. Given a pervasive presence of this form of micro-credit in poverty counties, alternative approaches to delivering rural finance, based on market interest rates, have difficulty competing with this welfare-delivery program. Also, the magnitude of poverty-alleviation funds involved has caused this approach to micro-credit to dominate the rural finance development agenda in lower-income regions of China. Micro-credit is offered in poverty-reduction programs with an intent that the poor will graduate to an income level where they will be served by existing financial institutions. There is evidence that some county governments now recognise that this assumption is not valid (Park and Changqing Ren 2001). As a result, some poverty-alleviation loan funds are being used to establish micro-finance programs to expand the range of financial services available in these rural areas in a manner that presents new opportunities for households designated as being in poverty.

Agricultural Development Bank of China

The Agricultural Development Bank of China (ADBC) primarily carries out a government mandate to finance the purchase of important agricultural commodities. It relies mainly on the People's Bank of China for its loan funds. More than 90% of ADBC's loans serve to finance government purchases of strategic commodities such as grain, cotton and oil (Han 2003).

It does not lend directly to small farmers.

The financial system's failure to serve low-income rural households

Experience shows that lower-income groups in many parts of China are not served well within China's current formal financial system:

- Existing banks and other formal sources of credit focus on the more-developed parts of the country and are not as accessible in the poor counties and remote areas in northern and western China. The World Bank and the Asian Development Bank observe that existing formal-sector banks are unwilling to include low-income households because transaction costs involved are too high. More profits can be made lending the available deposits to larger firms and farmers (Sterner 2002).

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- In general, formal sources of credit require collateral as security for a loan. This practice prevents low-income borrowers from obtaining credit for new business or farming ventures.
- Savings mobilisation is achievable and essential for sustainable rural financial intermediation. Experience with organising micro-credit in rural areas suggests loan funds for an association need to grow to a minimum of one million yuan if it is to generate adequate revenue to cover operational costs (Branch et al. 2003). However, savings mobilisation is still the forgotten half of rural finance within the existing financial system. As a result, institutional loan funds available in rural areas generally cannot meet demand. There is a need to design saving services that serve lower-income rural households. Mixing voluntary saving for members with compulsory savings can encourage savings behaviour.
- Studies have demonstrated that loan-repayment rates will decline if borrowers and savers do not believe they will benefit from the long-term survival of the institution, and they lack a sense of ownership of the program involved. Public confidence built on transparency and community control of the financial institution is important for rural financial development.

According to Scott and Druschel (2003), overcoming these shortcomings, by extending the rural financial system, can promote rural development:

> There is no contradiction between the objective of fostering a commercially sustainable rural financial system and promoting rural income expansion and welfare. Most firms and households that have profitable business opportunities value timely, reliable and convenient *access* to financial services (especially loans, savings and insurance products) and generally are willing and able to pay a market price for them.

They go on to challenge the myth that subsidised credit programs are required for small, low-income firms and households. As in other countries, subsidised credit is in finite supply, with the subsidies captured primarily by borrowers who are 'well connected', which need not be the potential borrowers with the highest expected-return business opportunities.

> By offering credit in a convenient and flexible manner according to commercial principles and the expressed needs of their customers, commercially sustainable rural financial institutions can substantially improve the efficiency of the allocation of credit in rural markets. By pursuing business strategies oriented toward meeting the need of clients, they similarly can substantially improve rates of savings mobilization' (Scott and Druschel 2003).

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THE PLACE OF CREDIT IN AGRICULTURE AND RURAL DEVELOPMENT

Credit facilitates development; it is not a determinant of development. Credit enters when entrepreneurs, including farmers, are willing to exploit opportunities to employ new resources and/or combine existing resources to exploit new markets for existing or new products. To make these changes, entrepreneurs require access to finance. The availability of credit can facilitate such entrepreneurial activity.

Women involved in selected rural-poverty-alleviation projects have demonstrated an ability to take a small loan and transform it into a stream of income that covers the forced saving and the interest charges plus provides a reasonable return on investment. This shows that there is latent entrepreneurial talent, even in low-income households in counties designated as being in poverty. The development observed goes beyond an increase in income for the borrower (Park and Changqing Ren 2001). It also takes the form of increased self-confidence of the women, improved social status of these women in their community, improved health of household members, and freeing of time from labour-intensive household chores to invest it in remunerative activities.

For peasant households it is important to recognise that immediate, short-term credit needs may well arise from family emergencies or spending expected for important life-cycle events—birth, marriage and death—within the family. Zhang Jie (2003) distinguishes a 'surviving economy' mentality and a 'rational small farmer' mentality evident simultaneously in typical peasant households. It is credit sought under the latter that leads to productive investments with some probability of success. Income transfers obtained from kin, especially to address 'surviving economy' needs, are a form of mutual aid, and typically are not seen as credit (Ma Zhongfu 2003). It is reasonable to expect such transfers will remain unreported in surveys of credit activity. Relying on moneylenders as a source of finance is usually a last resort as their interest rates are 2–10 times those of official rates (Ma Zhongfu 2003).

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FINANCE OPTIONS FOR LOW-INCOME FARMERS AND PASTORALISTS

Formal credit institutions

In general, the proportion of loans provided by formal credit institutions to peasant households is limited. The People's Bank of China sought to address this by initiating in 2001 a program to encourage RCCs to develop micro-finance options but, as reported above, coverage in the rural areas remains low. There is some evidence, though, of pay-off to this new initiative in that RCC loans to peasant households more than doubled during 2002 to 75 billion yuan (Zhang Hongyu 2003). Nonetheless, it is Han's (2003) assessment that:

> After all major commercial banks one by one withdrew from the countryside, dependence solely on the strength of credit in the rural credit union system will by no means be capable of resolving the difficulties of the peasants in obtaining loans.

Informal credit: extended family and money lenders

The primary source of credit for small, low-income rural households is the extended family and moneylenders. A survey of 365 households in 21 counties in 5 provinces reports 61% of borrowing transactions are from informal, non-bank sources. The RCCs account for 31% and the Agriculture Bank 4% (He Guangwen 1999). On the deposit side, RCCs provided 62% of total transactions and the Agriculture Bank 20%. Of the total number of loan transactions, only one-third were for investing in productive assets. Average interest paid was 0.95% per month, with rates as high as 3% per month. Similarly, in a survey of 472 peasant households in one county in Sichuan Province, Chen Fan (2003) reports only 5% of the households had loans from a RCC; 82% borrowed from relatives. Some 71% of the households reported they would be willing to borrow from a RCC, but only 40% thought they could obtain such a formal loan.

Micro-finance organisations

Micro-finance is a growing option, although it meets the credit needs of only a small portion of China's many small farmers. [For a survey of China's micro-finance experience see Du (2003) and Cheng (2003). Park and Changqing Ren (2001, Table 1) provide a list of internationally funded micro-finance projects in China.] The ability

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of micro-finance to address their credit needs is currently constrained by regulations that prevent associations and institutions from taking deposits and limit interest rates from being set at market clearing levels (Park and Changqing Ren 2001). Where the emergence of a range of micro-finance initiatives shows promise for the future, the sustainability of such programs is still not assured (Han and Cheng 2005). In all cases, initiating the programs has been subsidised. This includes loan capital provided by donors, use of poverty-alleviation loans at subsidised interest rates as another source of loan capital, extensive training and advice provided by such institutions as the Chinese Academy of Social Sciences and by donors, and the use of government employees to manage and deliver credit programs (Du 2003). Of specific concern is the future of government-run micro-finance programs, which are, in general, performing poorly (Park and Changqing Ren 2001).

The place of small-farm households within the formal financial system

Within China's financial system, loans provided by RCCs, the ABC and the ADBC account for 17% of total lending (Han 2003). Han concurs with others—e.g. Zhang Jie (2003) and He Guangwen (1999)—that the extended family and moneylenders are the primary sources of credit for small farmers. Han (2003) reports:

> Informal credit is quite widespread. Considering sources of borrowing, the main channel through which peasant households borrow is popular private loans. It is estimated that between 50% and 60% of peasant households have obtained informal loans while the ratio of their popular borrowing exceeds 70%. This is commensurate with a part of town and township enterprises which seeks high interest financing through popular channels. However, informal credit has no legal position.

Rural household savings on deposit have grown at an annual compound rate of 20% since 1990 to 1382 billion Yuan in 2001 (Scott and Druschel 2003). Nonetheless, small households in lower-income regions are not served well, as micro-finance organisations are generally prohibited from accepting deposits. Based on a survey of emerging Asian markets, Dickie (2003) concludes:

> …the experience from emerging Asia is that it is difficult for an existing financial institution to sponsor or create effective microfinance programs. While such approaches can be encouraged and may well be beneficial, they are likely to represent a diversion for the concerned bank and be limited in scope.

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This conclusion applies also to China. Given the high administrative costs of maintaining a large portfolio of small loans in rural areas, the band of interest rates allowed by the People's Bank of China is still too low to permit earnings that provide competitive returns on the lending institutions' assets and equity and hence assure commercial sustainability (Scott and Druschel 2003; Han and Cheng 2005).

DOES CREDIT AVAILABILITY CONSTRAIN RURAL DEVELOPMENT?

The limited evidence on credit availability and lack of credit as a constraint to rural development is mixed. Park and Changqing Ren (2001) cite a 1997 survey in six poor counties in several provinces, which '…found that nearly two-thirds of households either had an outstanding formal loan (mainly from RCCs) or felt they could get one if they wanted (the amount, however, is constrained)'. But total borrowing increased where additional sources of credit became available. Again, Park and Changqing Ren (2001) cite results from a Chinese Academy of Social Sciences survey which found that 25% of the respondents would not have undertaken the scale of their current projects if micro-finance had not been available.

Of specific concern is that poor households are still largely excluded from the existing formal financial system operating in China. The people are assumed to be too poor to be able to save. As a result, they are not encouraged to hold their savings in a financial form. Second, low-income borrowers tend to be excluded from formal financial programs because they lack the collateral needed for a loan. Also, existing institutions are often not located conveniently to serve the needs of poor households. Third, even where loan funds available might be adequate, the interest rate ceilings limit the ability of RCCs to generate the revenue required to employ adequate staff to administer a portfolio of small loans spread over a large number of small farmers. One expression of a lack of financial options to save and borrow is pastoralists, who view their herds of animals as their 'bank'. The animals are a form of saving that can be turned into cash when needed. They also represent various forms of insurance to meet emergency needs for cash in times of illness, accident, unemployment or death. It can be demonstrated that, if these pastoralists viewed their animals as an investment, to be used to maximise household income, male animals other than for breeding or draft purposes would be sold as calves or within four years and non-productive females would be similarly sold off. Provided there is a market for

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milk, hides, wool and meat, herd size would be considerably smaller and household income would increase. Such a transformation to a higher-income, more sustainable form of animal husbandry becomes an option only if there are alternative, preferably financial, means for saving, borrowing and insurance (Sterner 2002).

A case can be made that there are significant cash-flow constraints at the small-farm level, especially in western and northern China. Even if a well-functioning rural financial system—as defined by Stiglitz (1998)—emerges, it does not follow that such a system will channel credit to small farmers. For donors intent on investing in poverty alleviation, a question to ask is whether devoting a set of funds to establishing a sound micro-finance program will advance household income and well-being more than some alternative use within the community of that set of funds. Finally, a hypothesis that needs to be tested is whether the location of available credit in investments that provide rural, non-agricultural employment will have greater development impact on small-farm households than locating such funds as some form of farm credit. This is an important hypothesis because of an estimate made in 2000 that 30–40% of farmers need to move out of agriculture to enable the agriculture sector to move forward in a manner that generates farm-household income-streams comparable to the non-farm incomes available (Rempel 2002).

POTENTIAL MODELS FOR RURAL FINANCE REFORM

Extending China's financial system to draw in lower-income peasant farmers, both as savers and borrowers, is basic for agriculture and rural development to serve as a means to reduce rural–urban and regional income disparities and to alleviate rural poverty. How can this best be done?

Relevant experience in China

Successful extensions of financial systems to incorporate small farmers, especially those located away from an economy's centre, typically build on farmers forming associations to overcome their own problems. Some examples drawn from other low- and middle-income economies include the Grameen Bank of Bangladesh, the Bangladesh Rural Advancement Committee (BRAC), Bank Rakyat Indonesia (BRI) and BancoSol in Bolivia. In China, there is now extensive experience with various approaches to micro-finance that can serve as models for reforming existing financial institutions and facilitating the emergence of new, rural financial institu-

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tions. For the purpose of this discussion, micro-finance is defined as 'a program of action within a community that builds institutions to encourage and facilitate savings, to extend small loans and to offer financial and social services in a manner that addresses the causes of poverty in the community' (He Bing and Rempel 1999). What distinguishes micro-finance from commercial lending or bringing aid to the poor is that 'low and middle income groups are the designated target customers… provided with financial product services' (Du 2003).

For example, in 1994 the Chinese Academy of Social Sciences, with the cooperation of the Yixian County government in Hebei Province, introduced a Grameen Bank model in a micro-finance project. Financial and technical support was provided by the Ford Foundation, the Grameen Trust and the Canada Fund. Given the success of this project in Yixian, it has spread to Yucheng and Nanzhao in Henan Province.

Given the experience in the other provinces, Yucheng created its own model, which has reduced poverty in that county. The county helps low-income farm households to organise. It also uses weekly meetings and relies on group liability to assure repayment. The company distributes loans to groups and offers technical help. The core element of the program is connecting scattered household management with domestic and world markets. This facilitates specialisation in production, unified operation, business management and social services to transform traditional agriculture into a market-based agriculture.

In addition, major donors have funded and operated micro-finance activities: World Food Programme (WFP), International Fund for Agricultural Development (IFAD), United Nation's Development Programme (UNDP), United Nation's International Children's Fund (UNICEF), and the United Nation's Population Fund (UNFPA) plus several non-government organisations (NGOs). In his summary of China's experience with micro-finance, Du (2003) notes that China's continuous reform of political and economic systems has provided a policy environment for implementing sustainable micro-finance to assist people living in poverty that has generated micro-finance initiatives with unique features:

> …China's experiments in micro-finance, when compared with large-scale micro-finance institutions and projects including those in parts of neighbouring South and Southeast Asia, is different with regard to time, scale, design thinking, operational entities and the policy environment for implementing micro-finance.

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> Assessing this micro-finance experience, the World Bank (1999) concludes: Despite its sensitivity, particularly in terms of interest rates, microfinance experiments are currently being successfully carried out by a range of government, semi-government and development agencies. While the results are invariably promising, the broader policy environment of directed and subsidized credit continues to raise major obstacles to large-scale expansion. On the interest rate question, all agencies are constrained by the low interest rate ceilings that form the credit basis of the Government's 8/7 and other poverty reduction programs and constitute an important element of the Government's *socialized market* approach. Apart from the question of achieving financial viability given the minimal interest margin available, other problems include the non availability of microfinance institutions and the inability of non-banks to collect savings.

Canada's experience with credit unions as a source of rural finance

In Canada, farmers, especially in Quebec and on the Western Prairies, formed effective co-operative ventures to address their problems. For example, organising provincial-level grain-marketing co-operatives was their response to a few firms dominating the purchase of grain from farmers. Similarly, credit unions were formed to encourage rural people to save and to ensure that these savings were channelled back into the community in the form of loans for local enterprises and farmers.

The first successful credit union, Caisse Populaire, was formed in the Province of Quebec in 1900. The Antigonish Movement initiated credit unions in eastern Canada during the Great Depression of the 1930s. The concept spread quickly to western Canada. The evolution of a financial system that advanced Canada's development may have some relevance in identifying the main factors to be considered in extending the formal financial system in China:

A provincial base for a system of rural savings and credit associations

The credit unions are governed by laws of the province in which they are located and are not subject to the regulation exercised by the Bank of Canada over Canada's commercial bank. Credit unions in each province have joined together to form 'credit union centrals' at the provincial level. The credit unions, as members of the central, must hold a portion of the value of their deposits (8% in Manitoba) with the credit union central. In return, the central serves as a lender of last resort where credit unions may borrow up to 10% of the value of their deposits if they encounter a temporary liquidity shortage.

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Subsequently, provincial governments have created credit union deposit guarantee corporations, which guarantee the deposits of members within each credit union. In the event a credit union declares bankruptcy, this deposit guarantee corporation pays members the value of their deposits in that credit union. In some provinces, the guarantee is for the full value of deposits; in others there are maximums set for each deposit account that will be guaranteed in case of credit union failure. Credit unions pay annual fees to cover the cost of operating this deposit guarantee provision. Along with the credit union central, a provincial deposit guarantee corporation has a regulatory role: for example, it sets a percentage of the value of deposits that has to be held in cash or as deposits in their credit union central. Initially, the deposit guarantee corporations provided full audit services for credit unions. This is now limited to periodic audits of loan portfolios. If such an audit indicates a credit union may be encountering difficulties, a deposit guarantee corporation can implement a 'watch', where special assessments are carried out of loans made by the credit union. If there is evidence of fraud, it can be granted supervisory power to temporarily take over the management of a credit union.

A role for a national apex body

The provincial credit union centrals jointly formed a national apex body, the Canadian Cooperative Credit Society in 1953. It serves as a lobbying group and provides certain services at the national level, such as cheque clearing for cheques written in other provinces and providing national switches for the automated teller machine (ATM) systems.

Provision for accepting deposits to build institutional sustainability

From the outset, credit unions were able to accept deposits, which provided members with an option to mobilise savings in a financial form and served as a means for credit unions to grow. In some cases, members held deposits as an act of charity to assure funds were available for lending to families in need. Some credit unions also used forced savings—a deposit equal to a small percentage of the loan—to build a loan fund and as a form of collateral. A need for a larger loan fund, to facilitate community development was recognised early on, and voluntary savings were induced with the payment of interest on deposits. Over time, credit unions expanded their range of financial services, including cheque accounts.

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Approaches to minimising the risk of loan defaults

In some provinces, the initial legislation required each credit union to be based within an affinity group—residents of a particular community, employees of government or of a specific firm, or members of a religious group—and financial services could be offered to members only. This restriction facilitated the vetting of loans, reducing risk as clients were known. Also, it served to develop the trust required to attract deposits. Establishing credit committees, which included board members as well as staff, to decide who would receive a loan also served to reduce risk and to assure transparency and accountability for the loan portfolio. Credit committees now are typically staff and, in many cases, only loans above a certain size need to be vetted.

Increased competition for existing financial institutions

Credit unions were able to compete with commercial banks because they had low administration costs, were located within the community and had convenient hours of operation, and they could assure that savings deposited would be used for mortgages and investment loans within the community. In many cases they have become effective competition for banks and have contributed significantly to the development of rural communities in parts of Canada. Factors that contributed to the success of credit unions in Canada include:

- involvement of community leaders was important to gain local acceptance
- defined membership where members were known by credit union staff and/or board members
- management and operation of credit unions was located with credit union members with direct involvement of government excluded
- financial services were offered to business firms in towns as well as to farmers, creating a more diverse loan portfolio that reduced risk somewhat
- creation of the credit union deposit guarantee corporations significantly increased member confidence in credit unions as a place to locate savings
- the operation of credit union centrals increased overall stability through regulation, through services to members and as a lender of last resort
- operations were kept simple, with a primary focus on meeting the financial needs and demands of their respective members.

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EXTENDING FINANCIAL SERVICES IN RURAL AREAS

Potential options for reform of existing rural financial institutions

A failure to define property-rights relationships creates a regulatory nightmare for the China Banking Regulatory Commission. In setting-out options for rural financial reform it is important to avoid creating a multitude of small nightmares throughout the country. Specifically, the regulators will be concerned that: '…property right relationships should be clear, the mechanisms of restraint should be reinforced, service functions should be strengthened' (Han 2003; Han and Cheng 2005).

The following several options for an orderly financial system meet these conditions:

Option 1: Reorganise RCCs as joint-stock companies

Under this option, each local RCC branch would be reorganised as a locally owned joint-stock company (Han 2003). No specialised legislation is required, as joint-stock companies form part of the national banking legislation. The appropriate regulations and laws would apply and would govern management and operation of such financial institutions.

Option 2: Reorganise RCCs as cooperative banks (credit unions)

Alternatively, the ownership of each local RCC could be reorganised as a thrift-and-credit co-operative, owned by those residents of the community who chose to take out a membership. The intent would be a non-profit association that operates as a commercial enterprise without interference from local government officials (Scott and Druschel 2003).

Option 3: Experiments with options 1 and 2

The State Council of the People's Republic of China, as of August 2003, initiated a pilot project in eight provinces—ZheJiang, ShanDong, JiangShu, JiLin, JiangXi, GuiZhou, ChongQing and Shanxi—to further the development of RCCs. The intent appears to be to transform RCCs within each province into a provincial bank. This could be a one- or two-tier bank. A two-tier bank would have a lower tier of either option 1 or 2 above and an apex tier at the provincial level. In either case, overall management of these transformed RCCs would then shift from the People's Bank

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of China to provincial governments or to a combination of local owners and their provincial government. Central-government support for this initiative includes: special loans from the People's Bank of China, a fiscal subsidy, a reduction in selected taxes, and greater flexibility in setting interest-rate policy.

Promoting the development of rural savings and credit associations

To extend accessibility of lower-income rural households to formal financial services, additional financial institutions need to evolve. This would provide an additional benefit of increased competition in the delivery of financial services in the rural areas.

The People's Bank of China has initiated a study to determine the desirability and feasibility of allowing associations to be recognised as non-bank credit institutions. Financial services offered would be limited to members only and such institutions would operate on a non-profit basis. If implemented, this would provide opportunity for obtaining a legal basis for associations and institutions created as part of China's emerging micro-finance program. It represents a significant, commendable change in that additional financial institutions will emerge in rural areas, opening up the possibility of more-effective competition for both depositors and borrowers. Competition will extend the reach of such financial institutions and will spawn innovation in the delivery of financial services.

China's unique experience with micro-finance and other forms of non-formal credit institutions can serve as a base to build new, formal financial institutions that meet the savings and borrowing needs of low-income households—both farming households and small business owners (Watson 2003; Cheng Enjiang et al. 2003). A rural savings and credit association, patterned somewhat on credit unions (e.g. as in Canada), is recommended as a model.

Such associations will require regulatory and legal changes that will enable micro-finance programs to mature into financially sustainable institutions. To make such changes, the China Banking Regulatory Commission will need to clarify definitions of property-rights relationships and, where necessary, advance legislative changes to assure the transparency and accountability required for the development of sound savings–credit institutions. In addition, options for mobilising savings, including

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payment of interest for savings, will need to evolve. Sustainable operation will require interest-rate liberalisation, to allow a premium between what is paid for savings and what is charged for loans that is adequate to cover operating costs (Onyang 2003).

A starting point for a rural savings and credit association will be either an existing affinity group or the creation of affinity groups to meet the condition of offering financial services to members only. Ideally, each affinity group would constitute a local informal network that can facilitate assessment of the suitability of clients who have applied for loans. As low-income households typically cannot offer full collateral, knowledge of the client serves as the basis for initiating a ladder approach to developing a credit history—initially small, short-term loans for consumption, moving up to larger loans for investment purposes. Co-insurance of loans may be considered in the form of group lending, which draws in members of an extended family.

Zhou (2004) argues that there is a psychological barrier, based on negative past experience, to the concept of the cooperative. Currently, 'company and rural household' is the alternative model popular among farmers. This model cannot form the basis for building an association as it entails contracts between individual farmers and a company. Effective farmers' professional associations exist in some villages and could serve as affinity groups to start rural savings and credit associations. Other models for forming affinity groups will need to be pursued to enable low-income households in rural areas—farmers and small businesses alike—to cooperate in addressing their local needs for basic financial services.

In the spirit of micro-finance, and consistent with expected legal changes, savings-and-credit associations will start by providing non-bank credit services. The collection of voluntary savings from members, which are then deposited in existing banks, e.g. RCCs or area branches of the ADB, can be one approach to building savings mobilisation. It may be possible to leverage the delivery of such deposits for a percentage of an RCC's or ADB's deposits as a loan fund to be administered by the rural savings and credit associations. Similarly, it may be possible to leverage poverty-alleviation funds available to counties as low-interest credit as the basis for extending an association's loan fund.

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Primary elements of an extended rural finance system

Extending the current financial system in rural areas, using models such as those outlined above, can serve as a program of action within a community that builds institutions to encourage and facilitate savings, to extend small loans and to offer financial and social services in a manner that seeks to overcome the causes of poverty in the community. Such a program can be an effective tool for economic and social development if it is designed to provide financial services—for savers and for borrowers—to low-income households.

A typical program offers small loans, through informal appraisal of borrowers and investments, with access to repeat and larger loans based on repayment performance. As low-income households typically cannot meet collateral requirements of formal credit institutions, collateral substitutes, such as group liability, compulsory savings or some form of guarantee are required (Ledgerwood 1999). Other than basic financial services (e.g. insurance), some institutions also provide social services such as group formation, development of self-confidence and training in management capabilities.

The successful operation of all financial institutions requires public confidence. A sound macro-economic environment can serve to build and maintain such public confidence. Such an environment has two important elements:

- well-defined laws and procedures that govern the accounting, auditing and reporting requirements for all financial institutions
- a stable, growing economy that enables small entrepreneurs to undertake new ventures and to sustain the profits over the time required for loan repayment and provide local employment while producing the goods and services in demand in the community.

Even the best-designed and most-efficient rural finance programs may fail in the absence of such a sound macro-economic environment.

Other specific policies that serve to extend a financial system in rural areas include the following:

- Interest rates for loans and deposits that cover the rate of inflation and the cost of offering financial services must be enabled. Park and Changqing Ren (2001) provide substantial evidence of the ability of small farmers to bear market-clearing interest rates. Indeed, they argue that the opportunity cost of the time

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involved travelling to and from meetings and attending micro-finance project meetings is likely a more significant deterrent than interest rates up to 3% per month. Dickie (2003) also makes the case for deregulating interest rates and allowing institutions to vary interest rates dependent on the credit risk of the prospective borrower.

- The self-reliance of rural finance institutions can be improved through increased mobilisation of savings in the form of deposits.
- Decentralised institution development at the village level will help to ensure poor people have access to savings and lending services.
- Sound accounting and auditing practices will ensure sustainability through professional management of costs and risks.

Given an expanding education base among the rural population, and a dynamic, growing economy, it is realistic to expect Chinese farmers and small businesses can develop new financial institutions that serve their needs. Within an appropriate regulatory environment that facilitates associations of farmers and small businesses, they have the same sorts of capabilities as those of the Bolivians who developed BancoSol, the Bangladeshis who developed BRAC, and the Indonesians who developed BRI. The examples of financial institutions developed in Hebei and Henan Provinces cited earlier are good indicators of what is possible in China.

Nonetheless, micro-finance development in China is a relatively new phenomenon. Training is needed to strengthen management, to improve staff quality, and to enable members to exercise ownership (Du 2003). Levels of government with a goal of promoting micro-finance to mature into formal financial institutions could assist this process through the support of such training ventures (Dickie 2003).

Experience in China and elsewhere has demonstrated that interest rates at levels that enable credit programs to flourish can serve as an effective poverty-reduction strategy. Examples of such programs are provided in He Bing and Rempel (1999) and Park and Changqing Ren (2001). This experience has demonstrated that poor people can and want to save, they can pay commercial interest rates, and access to non-subsidised financial services is a primary means to growth and poverty reduction. The inclusion of such innovative approaches in a rural financial system opens the door to financial services for poor people who are currently being turned down by the existing formal financial institutions.

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An important cost factor in any credit program is loan defaults. Training for borrowers, plus regular monitoring of loan use and repayment can serve to minimise this cost. Where borrowers gain a sense of ownership of the funds on loan, loan defaults tend to decline significantly. An ability to accept deposits and then to link, in the minds of members, the loans and the deposits, serves to create this sense of ownership. A weaker, intermediate position is to establish a clear link between repayment of a current loan and access to future loans. Given that non-bank institutions are currently prohibited from accepting voluntary deposits, this latter approach is the primary method in place in China.

Information about potential borrowers can serve, in addition, as an important means to managing risk associated with loan defaults. The RCCs have initiated a credit rating system (Scott and Druschel 2003). With computer technology there is an option of extending the range of rural customers included within the rating system by drawing on the loan experience of all credit institutions and, in turn, making the database accessible to these credit institutions.

The role of government

The role of government in defining the requisite legal framework, complete with relevant regulations, for a comprehensive, competitive rural financial system is clear (Sterner 2002). Another important role is to inspect and to enforce relevant regulations and laws.

Where debate remains is whether governments at any level should be directly involved with any of the financial institutions. Traditionally, governments had an exclusive or primary role. Looking to the future, some argue government involvement is part of the problem and needs to be removed from ownership and management of emerging rural financial institutions (Du 2003; Zhang Jie 2003; Funding the Poor Cooperative in Yucheng County and Henan Province, as cited in Park and Changqing Ren (2001)). Others note county and local government officials tend to play a vital role in development initiatives involving associations or groups of farmers (Park and Changqing Ren 2001).

Agencies funding and promoting development have, in a number of cases, drawn on labour paid for as local government officials to subsidise their initial micro-finance initiatives. Some examples are: CIDA-funded Canadian Co-operative Association project in Xinjiang Province; CIDA-funded Integrated Rural Development Poverty

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Reduction Project; several NGO–government and government micro-finance projects in Shaanxi Province (Park and Changqing Ren 2001); and the Women's Credit Co-op in Mancheng (Chen Lanyan 1999). Relying on local governments in this manner, to cover some of the initial operating costs, may prove beneficial, provided ownership and management of rural savings and credit associations remain with their respective members. This management control would include a credit committee to assess loan applications.

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8.3 PROMOTING INSTITUTIONAL INNOVATION OF RURAL FINANCE IN CHINA

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AN OVERVIEW OF THE CURRENT RURAL FINANCIAL SYSTEM

The Government of China has given high priority to urban and industry development on the long road to industrialisation. Under this development strategy, the financial sector implemented a policy of favouring urban over rural finance, extracting rural funds to support the development of industry in urban areas. Though there have been some recent changes in this policy orientation, especially during the 1990s, the problem of financial institutions providing insufficient rural loans remains. The insurance industry, for its part, also focuses on the cities. In the absence of subsidies and support for agricultural insurance, insurance companies are unenthusiastic about underwriting agricultural activities.

Formal financial institutions

Formal rural-credit channels fall mainly into three categories: rural credit cooperatives (RCCs), the Agricultural Bank of China (ABC), and the Agricultural Development Bank of China (ADBC). These institutions issued loans totalling 11,200 billion yuan in 2001:

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agricultural loans were about 570 billion, accounting for 5% of the total, and township–village enterprise (TVE) loans were 640 billion yuan, 6% of the total. Even when loans for agricultural-product procurement provided by the ADBC are included, loans for agriculture and rural industry accounted for only 17% of the total loan portfolio.

Agricultural Bank of China

The ABC is becoming less active in the rural financial system. Before the mid 1980s, 98% of loans issued by the ABC were directed to rural areas. From the mid 1980s to early 1990s, the ABC adjusted its credit policies and 60% of agricultural loans were used to support agricultural-product procurement and the development of TVEs. After the mid 1990s, with rapid commercialisation, the ABC issued more loans for rural electricity, transportation and communication projects. As agricultural loans fell, the ABC's deposits from rural areas began to decline with the gradual transfer of its main business to cities and industry. The ABC's agricultural loans now account for only 10% of its total lending.

The ABC is now withdrawing its branches from rural areas, and poverty-alleviation funds have not attained set objectives. The state-owned banks of the ABC—the China Construction Bank (CCB), the Industrial and Commercial Bank of China and the Bank of China—have removed 31,000 branches at or below county level since 1998, leading to a dearth of financial organisations in rural areas and an increasingly uncompetitive financial market, with the formerly dominant status of the ABC in rural finance greatly weakened.

Rural credit cooperatives

With the ABC's gradual withdrawal from the rural financial system, rural credit cooperatives (RCCs) have become the main channel for formal agricultural loans. As of 2002, there were 37,000 independent RCCs, including 2460 county-level rural credit cooperative unions (RCCUs). From 1996 to 2001, RCCs issued agricultural loans of 1655 billion yuan, with an average annual value of 276 billion yuan. By the end of November 2003, RCCs held deposits of 2360 billion yuan, which is 12% of the total for all financial institutions in China; the loan portfolio was 1745 billion yuan, 11% of the total. The value of agricultural loans was 736 billion yuan, accounting for 85% of the total of such loans by all financial institutions. Some 587 billion yuan (80%) of these loans went to rural households. The loans extended to TVEs were 590 billion yuan, which amounted to 76% of the total loans to TVEs by all financial institutions.

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Though the RCC network covers almost all rural areas, only 25% of total rural households have taken RCC loans. New government projects have promoted the flow of funds into rural areas in the past few years, but the value of agricultural loans relative to total loans issued by RCCs has fallen from 46% in 1990 to 34% in 2000. With the withdrawal of the main commercial banks from rural areas, RCCs by themselves cannot be relied on to solve the capital shortage faced by rural households and small TVEs.

While RCCs are promoting rural-household micro-credit and group guarantee lending, which improves access of rural households to credit and alleviates some of the borrowing difficulties, several problems continue to restrict their ability to provide rural credit needs. These include management limitations, failure to adopt good business principles, and insufficient deposits. Furthermore, property rights and governance structure are not clearly defined. RCC members have only nominal property rights in the RCC in which they invest; the real rights are controlled by the state. An extension of this is that RCCs expect government to take the final responsibility for all non-performing loans. The governance structure of RCCs is fragmentary, with serious problems of concentration of decision-making in individuals and insider control. These problems contribute to a high proportion of non-performing assets.

Agricultural Development Bank of China

The ADBC focuses mainly on financial policy operation in agriculture for the central government, in particular to facilitate the movement of grains, cotton and edible oils. At the end of November 2002, the balance of loans of the ADBC was 724 billion yuan, with loans for grain and oil procurement accounting for 98% of this. More recently, with the development of the market economy and a deepening of reform of the grain circulation system, ADBC's business has shrunk. By the end of October 2003, its loan portfolio had dropped to 689 billion yuan.

The ADBC has limited capacity for rural institutional finance. First, its fund sources are unstable, depending mainly on Central Bank re-loans. Second, the efficiency of fund management is low. Third, its business scope is narrow as it plays only an institutional finance role in agricultural products procurement; it is, in essence, no more than a 'grain bank'.

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Post Office Savings

Although some of the funds deposited in the PBOC can be returned to rural areas to support agriculture, in practice such amounts are rather small. Post Office Savings has thus become the largest sink for rural funds. In addition, Post Office Savings has, in the past, depended on interest income from the Central Bank for its survival. On 1 August 2003, the PBOC reduced the interest rate on savings in Post Office Savings from 4.1% to 1.9%, equivalent to the interest rate of deposit reserve funds. Post Office Savings is thus faced with great challenges to sustain its operations.

Agricultural insurance

China's agricultural insurance system is inadequate. Each year in China, some 30 million hectares (25% of the total cropping area) are affected by natural disasters,. At present, the response to disaster relies on governmental agricultural disaster relief implemented by civil affairs administrations, and commercial agricultural insurance provided by the state-owned People's Insurance Company of China (PICC). In practice, neither of these agencies provides satisfactory results. A resistance in rural households to buying insurance, and other factors, mean that the risk of financial loss still resides in financial institutions.

Since 1996 agricultural insurance has been run mostly by the PICC. At the beginning of the 1990s, agricultural insurance made great strides, income from the business reaching 830 million yuan in 1993. However, with the transformation of the PICC from a policy insurance company to a commercial insurance company, it could not afford the frequent deficits from agricultural insurance. From 1982 to 2001, the cumulative income from agricultural insurance was 7 billion yuan and the insurance indemnity 6.2 billion yuan. When costs are taken into account, the cumulative deficit in agricultural insurance would be about 600 million yuan. Since 1994, PICC's income from agricultural insurance has declined relative to value-added in agriculture. It accounted for just 0.03% of added value in 2000. Income from agricultural insurance was 330 million yuan in 2002, accounting for just 0.6% of the total income from all types of insurance. This was 20% lower than in 2003, representing the largest decline in 20 years. Furthermore, the categories of agricultural insurance have dropped from more than 60 to less than 30.

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Government supports agricultural insurance primarily by waiving sales tax. It is estimated that—at a unified sales tax rate of 8%—the value of this exemption is 560 million yuan. Currently, there are no other economic supports for agricultural insurance. There appear to be two choices available: one is to set up a policy-oriented insurance company dealing exclusively with policy-related business; the other is for commercial insurance institutions to undertake government-subsidised agricultural insurance. In 2004, it was proposed in the No. 1 document of the central government that the establishment of a policy-oriented, agricultural-insurance system be accelerated. It would focus on selected products and regions for pilot schemes, and offer subsidies in insurance fees to crop and breeding industry farmers who buy insurance.

Domestic and international experience indicates that agricultural insurance has quasi-public goods characteristics. Therefore, its conduct as a fully commercial operation would likely result in market failure. Given its complexity and the high cost of supervision, agricultural insurance is extremely expensive and has limited profit potential. A policy-oriented agricultural insurance system implemented by government may be the better choice to support and protect agricultural development. If government and the market were to combine, government could determine the direction and quantities of the insurance supply and formulate a unified institutional framework within which various authorised organisations and institutions could operate agricultural insurance and re-insurance. At the same time, it could offer certain public financial or other kinds of support to agricultural insurance products.

In summary, China has made great efforts to reform the rural banking system during the past 10 years, but many of the problems prevalent in developing countries remain. There are still insufficient financial intermediaries in the rural economy, and funds are being channelled from rural areas to the urban sector. Another worrying issue is a massive bad debt (approximately 37% of loans are non-performing) within the rural financial system. Given limited capital and business activity to offset these bad debts, the survival and development of rural financial services are threatened. Insurance for agricultural activities must be improved, and this will likely require government intervention.

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Informal finance

Informal credit

Financial activities that are not conducted through formal financial institutions include free credit, credit middlemen (*yinbei*) and private money shops, revolving savings and credit associations (RSCA), informal fundraising, pawn credit and informal commercial credit. Compared with the formal financial system in rural areas, informal finance is disproportionately active, implying that the formal rural financial system fails to satisfy the demand for financial services in rural areas. The main channel for rural family loans is private credit. It is estimated that 70% of loans for 50–60% of families come from informal channels. This number is commensurate with that of usurious loans obtained by TVEs through social channels. Although informal credit is comparatively prevalent in rural areas of China, the government is unable to regulate the activity because informal credit organisations operate largely underground.

Micro-credit

Micro-credit, a system first introduced in Bangladesh, refers to services to low-income groups (including poor households). Its essence is to finance those low-income groups able and willing to undertake economic activity, but which cannot obtain loans from traditional formal financial institutions. It assists households to rise above poverty through their own efforts.

Micro-credit pilot projects in China are greatly influenced by the Bangladesh model. Small-scale, micro-credit pilot projects were initiated in rural areas of China at the beginning of the 1990s by non-government and public organisations using foreign funds. In the mid 1990s, the Chinese Government launched micro-credit projects for anti-poverty objectives and by August 1998, these projects had been extended to 605 counties in 22 provinces, with more than a billion yuan in total funds. According to statistics of the ABC, governmental micro-credit projects had issued 25 billion yuan in cumulative total loans, with a balance of 24 billion yuan, supporting over 17 million poor rural households as of the end of 2001. However, since this kind of micro-credit cannot accept deposits and depends completely on external financial support, its coverage and growth potential are limited. Also, the kinds of projects supported are not sustainable, because most of them depend on subsidies.

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By 2002, the RCCs had launched extensive micro-credit projects, issuing loans of 9.7 billion yuan to rural households, with balance of loans of 76 billion yuan at the end of the year. They also issued 47 billion yuan group guarantee loans to rural households, with a value of 25 billion yuan at the end of the year. This micro-credit has now been incorporated into the formal financial system, acquiring a new organisational form and institutional basis and achieving wider development.

ANALYSIS OF THE DEMAND FOR RURAL CREDIT IN CHINA

Rural household demand for credit

Rural household demand for credit is generally for small loans. The scale of family business determines the scale of credit funds needed for family living and production. Because of a relatively developed economy in eastern areas, rural private enterprises and individual businesses in rural areas are generally more affluent, and thus invest more in the non-agricultural areas such as industry, commerce, construction and transportation. The demand for capital is thus relatively high and loans are bigger (typically up to 10,000 yuan) than those taken out in central and western regions. In the less-developed western areas, rural households have little opportunity to engage in non-agricultural businesses, so their loan size per household is small (typically 100 to a few thousand yuan). In central areas, economic activity and living standards are intermediate between western and eastern areas, as are the sizes of loans taken out.

Loans can be used for consumption, working credit and/or abnormal credit. In most areas, the consumption credit of rural households exceeds their working credit. There has been some increase in abnormal credit use. The main purpose of household consumption credit is to supplement insufficient income and savings, so as to meet the needs of living expenses such as house building, marriage and medical costs. Working credit can be directed to agricultural and/or non-agricultural production. Working capital loans for the latter are the main part of rural household loans in recent years. In agricultural production, inputs for planting can usually be satisfied by the rural household's own funds. Working credit is often used in animal husbandry, aquatic industry and non-agricultural production.

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After the rural reform, most rural household credit was used in production and business activities. In recent years, the demand for consumption credit has exceeded the demand for working credit, mainly because farmers' incomes have grown slowly or have even fallen since 1995. Poor rural households borrow money to survive, particularly in the less-developed parts of the country.

Rural households that can obtain loans from formal financial institutions are mainly the richer ones with higher social capital; most low-income households can obtain loans only through informal channels. Strong demand for consumption loans is satisfied mainly by informal finance (Ye Jingzhong et al. 2004). As the income level of a rural household increases, so does the tendency to borrow for production rise and the tendency to borrow for consumption fall. On average, rural households in which the borrower is in the 31–40-year-old age range are inclined to borrow working credit, while other age groups seek consumption credit (Shi Qinghua 2002).

Although rural household income levels have increased greatly in the past 20 years, assets that can be used as collateral are still limited. The most valuable asset, or the most significant asset to mortgage, is the house. At present, since a house is a rural household's basic living guarantee, the value of taking a house as collateral is limited. Taking a deposit receipt as collateral for a rural household's loan can reduce credit risk, but most rural households do not have bank accounts. Some rural households borrow another person's deposit receipt as collateral, which turns formal loans into informal loans. The best way to satisfy rural-household demand for loans is to finance them with little or no collateral, but this violates current principles of the formal financial sector.

It is difficult for rural households to deal with complicated loan procedures, because they generally do not fully understand them. In addition, rural-household loan needs often require rapid approval. Tedious loan procedures may delay approval until after the time when credit was needed.

Most rural households would like to get loans with a term of a year or longer and with low interest rates. This is not only an economically rational choice, but is also driven by weak economic competency, especially in underdeveloped areas. In addition, rural households want financial services that are close by and convenient.

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There are many studies indicating that it is difficult for most rural households to obtain loans from formal financial institutions. Compared with the 1980s, the proportion of loans that rural households obtained from formal financial institutions has declined greatly. Before 1985, most loans were from the ABC and RCCs. This fell to some extent after 1990, but these agencies still accounted for about 40% of loans, whereas from 1995 to 1999, the proportion dropped below 25%.

Rural informal credit has the following characteristics. First, the proportion of loans with no interest is low and high rates are common. The understanding and usage of credit by rural households have undergone remarkable changes, with more and more farmers accepting loans with higher interest rates. Second, large loans are becoming more common. The proportion of small-scale credit for emergencies is on the decline, while the incidence of larger loans is steadily increasing. But all larger loans incur higher interest rates and often result in lawsuits. Third, credit instruments often do not follow accepted norms and frequently need only oral agreements. Even though there is a receipt for a loan, the content is very simple. Fourth, there are many delinquent loans, given the use of non-standard credit forms and a lack of effective regulation of rural informal credit. These loan defaults often cause disputes and are becoming an important factor influencing the stability of rural society. Finally, rural households in areas with a weak economic base have difficulty accessing credit given their poor credit status and the RCCs' low-quality credit services, weak financial capacity, and inadequate funds to support agriculture.

Township and village enterprise demand for credit

After reform, China's TVEs witnessed rapid development, with large increases in total economic volume. By the end of 2000, the gross domestic product (GDP) of TVEs accounted for 30% of the national GDP and 64% of the national rural social added value.

TVEs make various demands for financial services, with credit the main one. The sector features a high liability–asset ratio and a high proportion of informal direct financing to liability (Ma Zhongfu 2001). At present, formal financial institutions in rural China, such as the ABC and RCCs, can satisfy deposit demand of small and medium-size enterprises. For transaction services, banks such as the ABC have an advantage over the RCCs which, because of their management system, have a problem of slow transactions. On the matter of capital stock, the development process

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of TVEs means that their capital sources are diverse, including cumulative inputs of rural government, fiscal investment, government fund-raising, employees' stock, individual accumulation, formal credit, informal credit and foreign capital investment.

Before the 1990s, TVEs faced soft credit constraints. This led to abnormal credit expansion and high debt-to-asset ratios. Investment behaviour of TVEs often reflected strong impulses for expansion, which increased further their large demand for capital. The start-up, investment and operation of TVEs were not based on their own capital but depended on full use of various credit relationships. TVE financing and capital growth relied strongly on banks and RCCs, with commercial credit, governmental credit and intra-enterprise credit also playing a role. Since the early 1990s, TVEs have faced a relatively severe macro-environment and market structure. Along with the acceleration of property reform and the rapid development of direct financing, it has become more difficult for TVEs to realise indirect financing because of a decline in their asset value and loan quality. Small-scale TVEs especially were often discriminated against in their development and financing.

At present, there are still some contradictions in the assets and financing structures of TVEs. First, the proportion of fixed assets is large while that of liquid assets is quite small, which means that TVEs face severe shortages of working capital for daily operations. Second, stock and receivable accounts are large and increasing, which exacerbates the shortage of working capital. Third, the assets and financing structures are seriously misallocated, with low quality of assets, resulting in high financial risk and weak ability to repay short-term debts. If the macro-economic environment becomes severe, the ability of TVEs to use market opportunities may be squashed by the enormous pressure of repayment, which will destabilise their operations. Fourth, extreme, long-term dependence on debt hinders the growth of capital and has an increasingly serious negative influence.

In the future, rural financial institutions will remain a main channel for indirect financing of TVEs, though it is a fact that TVEs have difficulties in obtaining loans as the ABC and RCCs reduced loans to them during 1995–2000. Meanwhile, the proportion of TVE loans to the total loans issued all over the country has been in steady decline, from 11% in 1995 to 5% in 1998. Considering the fixed-asset investment of TVEs, the proportion of loans from banks and credit cooperatives fell from 26% in 1995 to 18% in 1998. The financing channel for fixed-asset investment has changed from dependence on loans from financial institutions to a focus on invest-

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ment by farmers, paying equal attention to loans and the absorbtion of idle social capital. In 2000, TVE loans from banks and credit cooperatives were 42 billion yuan, accounting for 16% of total investment.

EVALUATION OF THE PILOT REFORM OF RURAL CREDIT COOPERATIVES

In June 2003, the State Council announced 'the pilot project of deepening reform of rural credit cooperatives' and began a new round of reform of RCCs in the provinces or cities of Zhejiang, Shandong, Jiangxi, Guizhou, Jilin, Chongqing, Shaanxi and Jiangsu. This reform was extended to 21 provinces or cities, including Beijing, in August 2004.

This round of reform is focusing on:

- reforming the property-rights system of RCCs based on *faren* (independent business units), clarifying property relations, optimising corporate governance structure, and determining suitable forms of property rights according to different situations
- reforming the management system of RCCs, and handing over management authority of RCCs to local government.

Compared with earlier reforms, this round has made important breakthroughs in several areas. First, the system of property rights of RCCs has been diversified. Different rights patterns can be chosen according to the level of economic activity in the district and institutional operating state, such as joint-stock commercial bank, cooperative banks, *yiji faren* (completely independent business unit) or *erji faren* (affiliated RCC with independent business). However, whichever pattern it chooses, the RCC needs to verify assets and capital, broaden the scope of equity forms, and adjust equity structure based on its original shareholding. In order to diversify investment structure and keep control of RCCs away from minority interest groups, the PBOC has set some requirements for RCCs with different equity proportions (Table 8.1).

Second, the central government has allocated 38 billion yuan to RCCs in pilot areas to be used for assimilating non-performing loans. They have two options: one is *Zhuanxiang Daikuan*, a type of re-loan or on-lending with a low interest rate; the other is *Zhuangxiang Piaoju*, bills or bonds issued by PBOC which can be cashed-in when RCCs reach the requirements on non-performing loan (NPL) ratio and capital adequacy ratio set by the PBOC. Both are issued specifically for pilot reform RCCs and are used to deal

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with NPLs. The detailed amounts are checked and ratified by the PBOC, based on half of the actual insolvency amount at the end of 2002. Meanwhile, government also offers a subsidy to RCCs that are incurring losses, to compensate for their obligation to provide inflation-proof bank savings by following macro-policy of China from 1994 to 1997. The amount of the subsidy is determined in accordance with the actual payment made on the inflation-proof interest subsidy. In terms of tax, from 1 January 2003 to the end of 2005, all pilot RCCs are exempted from enterprise income tax temporarily in western areas, while the pilot RCCs in other areas are exempted from half of the income tax they should otherwise pay. Since 1 January 2003, the tax rate for all RCCs in pilot areas has been 3%. Moreover, RCCs in pilot areas are allowed to implement flexible lending rates, which can fluctuate between the benchmark lending rate and double that.

Table 8.1 Equity structure qualifications for pilot reform of rural credit cooperatives in China

	Employee	Individual investor	Single *faren* and affiliated enterprises
Rural commercial bank	≤25%	≤5‰	≤10% 5% disclosure
Rural cooperative banks	≤25%	≤5‰ total ≥30%	≤10% 5% disclosed with records
Unified *faren*	≤25%	≤5‰ total ≥50% starting point 1000 yuan	≤5% starting point 10,000 yuan

Third, this round of reform has given more freedom to local government. The reforms have two goals:

- to transfer the management authority of RCCs to local governments, making them bear the responsibility of supervision, guidance, coordination, and service for RCCs. They are to do this by setting up provincial or city-level rural credit cooperative unions, and county-level rural credit cooperative unions, thereby separating industry management from bank regulation.
- to reduce the dependence of RCCs on central funds, establishing a mechanism of self-restriction and self-risk-bearing, but at the same time avoiding administrative intervention in RCCs due to authority handed over to counties and towns.

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During the course of the pilot reform, local governments are required to resolve the other half of non-performing loans by self-financing. In terms of designing the reform project, the central government put forward guidelines only, and local governments are expected to devise pilot reform measures and implementation details for the reform.

Evaluation and reconsideration of pilot reform of rural credit cooperatives

Combining the reform measures and their implementation, we find that, although this round of pilot reform projects of RCCs has made important breakthroughs compared with earlier ones, there are still problems in executing the process. First, there are many historical burdens and NPLs in RCCs that were caused, directly or indirectly, by central policy. Reform of RCCs will be difficult if these burdens are not removed. It would be reasonable for central government to help RCCs to solve half of the historical burdens in this round of reform. At the same time, it is also reasonable policy to compel local governments to take responsibility for RCC reform by setting a series of requirements for acquiring re-loans and cashing special bills. Nevertheless, during the implementation process, local governments have tended to make full use of the reform policy to maximise their own rents when exposed to the temptation of so great an amount of capital from central government. In order to obtain this capital, local governments adopted administrative measures to meet the requirements for capital-adequacy ratio and equity structure because it was the most effective and quickest way. The approach commonly used to reduce NPL ratio is to enlarge the denominator—that is, issue more new loans—while the approach commonly used to increase the capital-adequacy ratio is to increase public financial input, enlarge capital and expand stock.

Under these measures, the proportion of NPLs fell markedly and capital-adequacy ratios greatly improved (Table 8.2). By the end of June 2004, NPLs in eight provincial or city RCCs had fallen by 29 billion yuan compared with the beginning of the year. Also, the RCCs made 1.4 billion yuan in profit. Between the end of 2002 and the end of June 2004, RCCs in eight provinces or cities expanded their shareholding by 33 billion yuan and their capital funds reached 44 billion yuan, giving a capital adequacy ratio of 5.7%.

Table 8.2 provides some details of outcomes in six pilot reform provinces. The performance in Jilin Province looks especially impressive: by the end of June 2004, the balance of shares added up to 6.6 billion yuan, about 20 times more than the initial shares, and the capital-adequacy ratio increased from –53% to 6%. After

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thorough investigation, it was found that Jilin Province, to make these great achievements, allocated the task of buying shares through administrative means and promised incentives to those who bought shares. Every employee bears the task of mobilising community members to buy shares, besides buying shares allocated to them. Moreover, the fulfilment of the task affects the performance assessment of the employees. The incentives include dividends, priority in loan applications, larger loans and a relaxed mortgage ratio, and a prime lending rate. Note, however, that the rapid expansion in the value of shares may be the source of a potential credit crisis. This is especially so given increased administrative intervention in RCCs by local governments, which will likely hamper further development of the rural finance market in Jilin Province.

Second, the pilot reform encourages each region to choose a pattern of reform suited to its level of economic development. While this is appropriate for China, which has diverse levels of economic development across the country, in practice most areas have chosen to establish county- and provincial-level rural credit cooperatives unions (RCCUs). The effect is 391 county-level *faren* unions, 6 rural commercial banks and 55 rural cooperative banks in 8 pilot provinces (cities). Where this reinforces administrative control, it also leads to a monopoly for each RCCU in its respective rural financial market. With reduced market competition there will be less innovation in the rural financial system.

According to the institutional requirements, the unions are to be cooperative organisations that are established through voluntary investment by member RCCs and they are to be managed democratically through a board of directors, a supervisory board and a stockholder conference. Many leaders of the unions are still appointed administratively, however, and some government officials still take up positions. This means that RCCUs have become administrative institutions.

Table 8.2 Comparison of loan capital circumstances before and after the pilot reform of rural credit cooperative in six provinces or cities in China

		Jilin	Jiangxi	Shanxi	Jiangsu	Chongqing	Guizhou
Non-performing loan proportion (%)	before	43.3	44.8	39.2	29.6	36.4	27.0
	after	13.8	35.2	27.5	10.9	26.2	13.8
Capital-adequacy ratio	before	−52.85	−7.10	−3.1	−2.8	−6.0	−0.9
	after	5.45	5.19	3.7		2.4	2.0

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Third, the intent of transferring management authority to local governments was to make them bear the responsibility and risk of RCC reform, to encourage RCCs to show self-restraint and self-risk-bearing, and to avoid heavy dependence on central capital. While it is true that in many developed, market-economy countries local governments exercise regulatory control of such financial institutions, local governments in China are pursuing political as well as economic objectives. They have goals of developing regional economies and increasing taxation incomes. Thus, it is inevitable that they will, through administrative decisions, interfere in capital allocation and the operation and management of RCCs. In addition, the pilot project requires RCCs to take responsibility for supporting the three agricultures (*San Nongs*), and this will make it possible for local governments to intervene through policy instruments.

Fourth, while the goal of this round of reform is to clarify property relations and improve corporate governance structure, there is a shortage of regulations related to property right and corporate governance in concrete reform measures. The result is that the pilot reform of RCCs is making only superficial adjustments and the internal organisation and management system remain unchanged. The personnel of RCCs change little: stockholder conferences have no real effect and neither have all sorts of elections; as *yiji faren*, county-level RCCUs still are not responsible to stockholders and members but to provincial-level RCCUs; the democratic rights of members have not been truly guaranteed. RCCs are officially controlled in the long term and lack the basis of public participation. Rural households and rural enterprises can hardly be enthusiastic about buying shares and participating in democratic management when property right is ambiguous and not well protected.

Fifth, it is not easy to get farmers and large rural business enterprises to voluntarily buy stocks in RCCs that show weak operational performance and when property rights were destroyed in the earlier rounds of reforms. In terms of equity structure, by the end of June 2004 the total capital stocks of RCCs in the whole of Jilin Province amounted to 6.6 billion yuan. Farmers' stocks had risen to 2.3 billion yuan, accounting for 35%, with the stock of employees of RCCs and big business enterprises accounting for 65%. The proportion of total equity held by farmers is too low to satisfy the POBC requirement for establishing a unified legal entity.

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Recommendations for deepening the reform of rural credit cooperatives

The first recommendation for deepening the reform of RCCs is to allow a larger degree of diversification during the course of reform. This would acknowledge that there are many less-developed areas in the extended pilot provinces, cities or districts, and that the differences in economic development and markets among pilot areas are now even greater. The transfer of management authority to local governments should be differentiated according to local economic level and the development of markets. In areas with developed economies and markets, management authority can be transferred to local governments but the authority of local governments should be clearly defined and those who exceed their authority should be penalised. In other areas with less-developed economies and markets, caution should be exercised in the handing over of management authority. The reason is that the lower the economic level, the more the hunger for capital. When local governments can obtain little capital, they tend to act aberrantly in order to meet the requirements for accessing capital from central government. Meanwhile, local governments are able to control the financial resources of RCCs more easily when the market cannot allocate resources efficiently.

Second, implementation of the reform should be evaluated and mechanisms for timely revision established. The criteria for evaluation should be simple and emphasise capital-adequacy ratios and NPL proportions achieved. The changes in property-right structure and fulfilment of democratic management should also be taken into consideration in the requirements for acquiring re-loan and cashing special bills, except for capital-adequacy ratio and NPL proportion. Where necessary, penalties should be applied for failure to meet objectives. The key reason for aberrant behaviour by local government in the former stage of pilot reform was that the reform emphasised only a few criteria and the process was not evaluated or audited.

Third, the requirements for property-rights relationships and corporate governance should be stated explicitly in the measures for pilot reform. Thus, the property and democratic rights of RCC members can be protected. To improve management of property rights and corporate governance, the first step should be to establish laws and regulations to identify and protect the various rights of RCC members; second, considering the lack of public participation in RCCs, it is necessary to cultivate the awareness and participation of rural households, large crop and livestock farmers

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and rural enterprises and to protect their democratic rights; third, a key factor in the reform is radical change in the personnel of RCCs to ensure that leaders at all levels are elected in a truly democratic way; finally, fair competition among RCCs should be encouraged and strengthened, and RCCs should be allowed to establish unions voluntarily, to unite or incorporate and to set up branches across different areas.

RECOMMENDED FURTHER REFORMS TO THE RURAL FINANCIAL SYSTEM

Building a diversified rural financial service system

A primary recommendation is that the ABC should, on the basis of commercial principles, enhance its support to leading enterprises and small and medium-scale enterprises engaging in agricultural industrialisation. The 'off-agriculture' tendency of the ABC in recent years should be reversed, and it should be developed into a bank that comprehensively supports the development of the agricultural and rural economy by providing the full range of financial services. A defined portion of deposits obtained in rural areas by the ABC should be channelled into agricultural credit.

Policy-oriented finance is an important and widely adopted supporting mechanism in accordance with requirements of the World Trade Organization agreement. Its essence is quasi-public finance, which is an effective combination of public and private finance. The Chinese Government should utilise the ADBC to integrate capital input into the countryside, and distinguish compulsory public financial inputs from subsidiary ones. Central and local governments should invest in rural public roads, significant ecological and environmental construction projects, and in research in basic agricultural science. Public-finance departments at central and provincial levels should set aside some funds for compensatory public-financial expenditures; that is to say, they should support policy-oriented financial institutions with an interest subsidy and compensation for losses due to bad or idle loans, and attract social capital to flow into agriculture and rural areas through use of small amounts of public-financial funds.

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The ADBC's medium and long-term functional orientation could support improvements and progress in the following fields:

- a regulatory and control system for the main national agricultural products such as grains, cotton and oilseeds
- infrastructure construction in rural areas, and improving the conditions of agricultural production and rural living
- agricultural structural adjustment to increase farmers' incomes
- agricultural research and development, and the application of new technologies, new products, new bio-resources etc. to strengthen agricultural competitiveness
- development of agriculture and the rural eco-environment, and promotion of sustainable development of agriculture
- regional poverty alleviation initiatives to accelerate the pace at which rural people can cast off poverty.

In addition, intermediary business roles could be developed. These would include, for example, acting as a surrogate to handle the allocation and settlement of public financial funds used to support agriculture, on-lending of loans related to agriculture from international organisations and foreign governments, and agricultural insurance. Similarly, the service function of the ADBC should be strengthened. The ADBC should move away from total reliance on Central Bank re-loans, and directly finance from the capital market by issuing bonds. In this way, the ADBC would expand from a pure 'grain bank' to a comprehensive policy-oriented bank, providing better support for agricultural development, rural infrastructure construction, agricultural structural adjustment and the import and export of agricultural products.

These reforms proposed for the ADBC could be linked to changes to Post Office Savings. For example, Post Office Savings could be required to purchase ADBC's bonds. Second, the Central Bank could transfer Post-Office-Savings deposits to credit cooperatives by means of re-loans. An alternative would be to sever the financial relationship between Post Office Savings and the Central Bank and make the Post-Office-Savings business an agent of the RCCs or ABC for deposit funds obtained from counties or below. If implemented, this combination of recommendations would serve to keep more of the capital absorbed by Post Office Savings in rural areas to promote a healthy internal circulation of rural capital.

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Encouraging and supporting the development of rural micro-credit institutions

Informal finance plays an important role, but does not receive the status it deserves. It emerged as a result of unsatisfactory financial institutions, dualistic characteristics of finance and difficulties in getting institutional finance in rural areas. Informal finance has played an active role in enlarging the capital base for rural production and operations, generating a flourishing rural financial market and improving financial efficiency. It has been especially important in promoting the development of individual and private enterprises in rural areas. Nevertheless, because it operates largely underground and is subject to high potential risk of losses, the government cannot effectively regulate the informal finance market. This limits its ability to bring informal finance into full play.

It has been 10 years since China implemented micro-credit pilot projects based on models from other countries. In 2001, RRCs began micro-credit business and, by the end of 2001, up to 32,000 of RCCs (about 80%) had a micro-credit service. About 25% of crop farmers took up this kind of loan. But most micro-credit projects were sustained by re-loans from the PBOC, and covered limited areas and people. Micro-credit should become a key business of RCCs and measures should be adopted to gradually expand non-mortgage loans and mutual guarantee loans. Micro-credit institutions, more generally, should be developed on a path toward sustainability.

Building on the community information they possess, RCCs should extend their efforts to launch household micro-credit and group guarantee loans by appraisal of the credit worthiness of rural households, villages and towns. Some towns, villages and even households are selected as credit towns (*Xinyong Zhen*), credit villages (*Xiyong Cun*) and credit households (*Xinyong Hu*). However, as the whole society is in a process of transition, the credit environment is far from satisfactory. The repayment rate for rural household loans of RCCs is tending to decline, which seriously affects the activity of financial institutions. In recent years, many enterprises engaged in supply and marketing, grains and TVEs, have defaulted, decamped and left loans at banks and RCCs. Seizure and appropriation of loans for poverty alleviation is prevalent and loans were often taken as grants rather than requiring repayment. Poor contract enforcement seriously affects credit risk and restricts investment of banks and RCCs in rural areas and rural enterprises.

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In addition, the role of NGOs in micro-credit projects should be confirmed. Local governments and financial institutions should take measures to reduce related controls and intervention, and endow non-governmental micro-credit institutions with legitimate roles. Although governmental micro-credit projects have not yet been implemented efficiently, their coverage is much broader, enabling many poor farmers to benefit from them. The projects are significant in satisfying the financial needs of low-income farmers. However, implementation needs to be improved. The government should also encourage international and domestic organisations to establish peer-supervisory projects or other innovative projects targeted at poor people. As part of this initiative to build a micro-credit system, rules governing entry to the rural financial markets should be relaxed. This should be combined with policy initiatives to develop and cultivate informal financial institutions that will foster a diversified, efficient rural financial organisational system and provide effective competition in the delivery of financial services in rural areas.

Special attention should be paid to confirming the significance of informal lending in accordance with market principles. Measures should be adopted to actively guide the development of informal credit organisations, to curb illegal financial activities, and to gradually legalise non-institutional finance and the dynamic interaction between institutional and non-institutional financial markets. Government could privatise RCCs and allow them to establish branches in other counties. In addition, government should allow privately owned banks to be set up and should encourage overseas banks to participate in rural financial markets. Furthermore, following the practices in other countries, establishing rural savings and credit associations (RSCAs) is an alternative. RSCAs are established on the basis of existing affinity groups. In most cases, these organisations are regional and mainly serve intra-community members. Each affinity group forms an informal regional network to evaluate loan applicants. This model can be tested and extended in Chinese rural areas where non-governmental and informal credit institutions and projects are widely available. To establish RSCAs requires an improvement of laws and regulations that are beneficial to the sustainable development of micro-credit. The Banking Regulatory Commission of China should clearly define property-rights relationships, and modify laws and regulations to ensure the transparency and governance system for healthy development of such credit institutions. If the experiments succeed, it will be possible to replace and effectively supervise some informal financial institutions.

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Reform of an inflexible set of interest rates

As interest rate controls still exist, depositors and micro borrowers face credit quotas and their capability for savings and lending is constrained. Since the business of micro-credit increases the management cost, the PBOC permits loan interest rates to fluctuate within a certain range. Nevertheless, loan interest rates permitted by the PBOC are still too low to provide an attractive return on assets to rural credit institutions. There is still a commercial survival problem for these institutions. Interest-rate control distorts resource distribution, and induces improper resource distribution and rent-seeking behaviours. Moreover, when the inflation rate is relatively high, real interest rates may be negative, which would discourage people from holding savings in the form of deposits. As a result, the development of financial services is slow, and cannot meet the demands of small enterprises and households.

Continued interest-rate control will distort the price of capital, lead to unreasonable allocation of capital and will do harm to economic benefits and sustainable development of rural financial institutions. Strict implementation of an official interest rate will block the development of RCCs and micro-credit. Interest-rate control should be relaxed gradually, with rates allowed to float within a wider range on the basis of market demand, to meet the requirements of commercial financial institutions operating in rural financial markets. Since financial markets are closely interrelated, the opening-up of interest rates is unlikely to be achieved without interest-rate liberalisation in the whole system.

Until financial markets are fully developed, a series of policies should be adopted to keep real interest rates of deposits positive and to control the growth of interest rates of both deposits and loans. To meet the problems of credit distribution and excess demand resulting from that, government may provide external financial support, on the premise of not impairing the motivation of financial institutions to mobilise savings. In other countries of Asia, increasing the interest rate on deposits greatly improved savings.

Establish a credit security mechanism for rural financial institutions

The fragility and high risk of agriculture lead to rural loans being of higher risk than those for industrial and commercial purposes, and rural financial institutions being exposed to higher risks than those faced by other financial institutions. At the same

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time, rural credit services are highly dispersed, which also increases the operating cost of financial institutions. For the same reasons, commercial insurance institutions are not willing to write agricultural insurance. Due to the limited financial capability of the government, policy support for rural financial institutions is far from satisfactory.

It is necessary to establish a deposit insurance company, to strengthen the credit standing of rural financial institutions, and to reduce the potential risks of financial institutions leaving the market. At the same time, a series of measures should be adopted to avoid a low repayment rate of loans caused by incomplete information in rural financial markets, e.g. group guarantees on lending and collective cooperation among borrowers. The establishment of rural social credit systems, as well as a healthy rural credit environment, will help resolve the asymmetric information problems between lenders and borrowers.

Strengthening supervision

The PBOC has been undertaking dual roles. It exerts a financial regulatory function and has become the administrator of RCCs since they left the ABC. The dual roles often conflict and this is widely regarded as one of the origins for many of the problems RCCs face. Until now, the regulatory pattern for RCCs has not differed from that for other financial institutions, and there has been no special regulatory framework for the rural financial market. To avoid the PBOC blurring its responsibility as a regulator of RCCs as well as an administrator, its regulatory functions have been handed over to the newly established China Banking Regulatory Commission (CBRC). Whether or not current problems can be solved efficiently and practically following these adjustments remains to be seen.

The successful operation of financial institutions depends on public confidence. To realise this, clearly defined laws and procedures are required for the accounts, audits and financial reports of financial institutions. Second, stable economic growth is needed. Under this condition, small enterprises are able to invest in new projects, constantly obtain profits to repay loans and, at the same time, help resolve local unemployment problems and provide services and products required by the market. In order to create such an environment, government needs to establish a set of efficient supervisory and control systems that reflect new thinking on these matters, and thereby improve its efficiency and quality. At the same time, the system should be equipped with measures for implementation of laws and regulations.

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Addressing constraints to development of a diversified rural financial system

The objective of micro-credit projects is to help low-income rural families to reach an income level at which they could begin to access normal financial services. However, many of the projects did not establish special institutions in order to sustain their development. Other financial services based on market interest rates thus have difficulty competing with micro-credit services, due to the subsidies the latter receive. As a result, the development of rural financial services has been affected, especially in the poorer counties.

While formal loans generally need mortgages, it is difficult for farmers to meet the requirements of mortgages. The largest asset they possess is land, but they do not hold the ownership right, and the market for land-use rights has just been established. In Vietnam, a certificate of land-use right can be used as collateral to obtain mortgages. After certification of land-use right was promoted, loans taken by farmers increased. Other loan practices also need to be considered: displacement of mortgage, loan information system, and credit evaluation tools, as well as classification and evaluation of loans. So far, shortage of these financial standards and operating procedures has resulted in serious conflicts within rural financial institutions over ownership, corporate governance, management skill and employee incentives.

Managers, directors or other employees must be directly responsible for the growth in bank assets (and these people's remunerations should be based on the performance of bank assets). Otherwise, loan practices are always filled with more political elements than financial considerations. At present, because there are no incentives, few people are willing to engage in improving asset quality. Research by Chinese economists proves that investment quality and loan return rate would be improved with more competition. Nevertheless, the finance industry is, at present, strictly regulated. Consequently, there is little competition, especially in rural areas, a circumstance that has led to monopolisation by the RCCs.

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