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**RURAL POVERTY AND ITS CAUSES  
IN CHINA**

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# Rural Poverty and Its Causes in China

Wu Guobao, Sue Richardson and Peter Travers

## 1. Introduction

Economic growth and the alleviation of poverty are two inter-related, sometimes contradictory, tasks for developing countries. In China, the economic reforms, begun in 1978, have brought about a dramatic growth in the rural economy. However, the effects of this growth on the reduction of poverty have been patchy. During the early years of the reforms, rapid economic growth in rural areas led to a great improvement in income and consumption for rural households. Almost all farmers, both rich and poor, gained benefits from the initial growth of the economy (World Bank, 1992). Unfortunately, this trend did not persist after the mid 1980s. Although economic growth has been remarkable since then, for many poor households, living standards have not improved significantly and poverty in rural communities remains serious. In some areas, income inequality rose substantially. Why were some farmers unable to benefit from the overall economic growth?

There is much debate on this issue. Different scholars have focused on different factors. There are three major hypotheses on the causes of rural poverty.

The first is the natural factors approach, or as Riskin called it, the ecological model (Riskin, 1993). It argues that poverty in rural China is mainly due to inadequate natural resources and limited access to such resources. This, however, seems insufficient to explain poverty in China as even in very poor areas, there are still some well-off farmers.

The second hypothesis attributes rural poverty to the failure of resources, including labour, to transfer from subsistence sectors, mainly agriculture, to more profitable sectors. This hypothesis cannot explain the great improvement in living standards and the reduction of poverty in the early 1980's, which were achieved mainly from the development of agriculture (Perkins, 1984; Selden, 1993; World Bank, 1992).

The third hypothesis emphasizes the effects of household demographic characteristics and income transfer policies on poverty. It suggests that disadvantages in demographic characteristics are the main reasons for poverty (Wang and Bai, 1986).

Each of the above three hypotheses are likely to be part of the explanation of the causes of poverty. However, the full story of poverty in China has not yet been convincingly told. Our study examines all three explanations of poverty. In doing so, it explores the constraints hindering poor households from benefiting from economic growth.

The paper is organised as follows. Section 2 introduces the data used in this study and provides some basic figures on the incidence of poverty in rural China. Section 3 investigates sources of income in poor rural areas. Section 4 examines relationships between resource endowments, physical conditions and income levels. Section 5 looks at the impact of demographic factors, including the dependency rate, population size and illiteracy rates, on household income levels. Conclusions and brief policy implications are summarised in section 6.

## **2. The Data and the Incidence of Poverty**

In China, studies of income inequality and poverty, as some economists have pointed out, are subject to many limitations due to the lack of official information concerning key aspects of living standards (World Bank, 1992; Khan, 1993). Individual scholars have gathered their own data in an effort to fill some of the gaps in official surveys. These individual surveys have their own problems. For example, many are based primarily on the recall of interviewees. Such recall is often incomplete and individual items are easily confused, especially where many respondents are illiterate. Aware of the shortcomings in official data and individual surveys, the authors have adopted a strategy which combines the best of both.

Specifically, a questionnaire of our own design was personally administered to 500 households which were in the State Statistical Bureau (SSB) long-term household survey. There was full compliance with our survey, which was administered by one of the authors (Wu) in 1992. We have been able, for each household interviewed, to combine the data from our own survey with those from the SSB survey. We thus have the accuracy of the SSB data and method together with the relevance and comprehensiveness that a tailor-made survey can provide.

The SSB household sample is selected through a multi-stage process. It covers all provinces. Within each province, the sample households are selected from counties, townships, and villages on the basis of average income and population size. The raw data are collected from households' daily records of economic activities as well as separate records by household members who work outside of their home town temporarily. The data are checked by village statistical assistants to ensure their accuracy. A drawback of this method is that at least one family member of each of the selected households must be able to write and enumerate and

the sample villages must be reasonably geographically accessible. These constraints are likely to lead to some underrepresentation of the poorer households (World Bank, 1992). Since our survey piggybacks on that of the SSB, it is subject to the same bias.

Our own survey was designed to obtain comprehensive information about the material standard of living of the household. In addition, we sought information about other aspects of a satisfactory life in order to be able to examine whether these were closely related to the household's material circumstances. Exploration of this latter question is reported in a separate paper<sup>1</sup>. Questions were asked about household demographic characteristics, literacy, health, social relations, income from all sources, time spent working, gifts given and received, debt, productive assets, consumer goods, housing status and estimated value of house, access to water and transport together with some questions about attitudes, such as optimism about the future. The questions were answered by the male head of household, usually in the presence of local officials and sometimes through a translator.

As shown in Table 1, our sample contains households from four out of the six officially defined poor regions (the regions which are not represented are Inner Mongolia and Tibet). On the three key indicators of arable land per capita, literacy and per capita income, the average values for our sample diverge at most 14% from the national average. This is sufficiently close to give confidence in the reliability of our data. Note that our sample, while somewhat over-representing illiteracy, also has slightly higher average amounts of land and income: we are not focussing on an untypically poor group.

**Table 1. Sample Areas as a Proportion of All Poor Areas**

Poor Regions	Own Sample (number)	National* Sample (number)	Own as a % of national sample(%)
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Regional distribution (countries)

<sup>1</sup> "Multiple deprivation in rural China", working paper no. 95/ Chinese Economy Research Unit, University of Adelaide.

1. The bordering region between eastern and western china	3	135	2.2
2. The karst region	2	110	1.9
3. The arid region in inter-Mongolia	0	10	0.0
4. The eastern hilly areas	1	95	1.0
5. The Loess Plateau	1	81	1.2
6. The high mountainous areas in Tibet	0	77	0.0
<b>Total poor countries</b>	<b>7</b>	<b>431</b>	<b>1.4</b>
Arable land per capita (Ha)	0.13	0.12	108.3
Illiteracy rate (%)	33.46	29.43	113.7
Minority nationality (countries)	3	n.a.	
Per capita net income (RMB)**	346.54	321.00	107.9

\* The national sample contains all the areas which are officially designated as poor.

\*\* Figures in the sample and the national average are expressed in 1989 values.

Source: Data for national averages are from the LGEDPA, 1989. Data for counties are from county statistics bureaus in the sample regions.

According to the Chinese official definition, disposable income comprises income from agricultural and non-agricultural activities within and outside households. In our study, we adjust this disposable income by adding two new items which are potentially important contributors to material well-being: transfer income and imputed rental income. The former refers to the incomes transferred from and to government, collectives and individuals. Taxes and payments to collectives in different forms are regarded as negative transfer incomes for households. The imputed annual house value is calculated as 5 percent of the estimated house value. Table 2 shows household disposable income and the incidence of poverty in poor rural areas using the sample data. The official and the World Bank's absolute poverty lines are adopted. Since these are expressed in 1985 prices, the income data from the 1992 survey have been adjusted to make them comparable.

Average adjusted disposable income is only slightly higher (4 percent) than the figure based on the official definition. This is because, on average, the transfer income in our sample is negative (this will be explained further later).<sup>2</sup> As such, it offsets partly the imputed house value in the adjusted disposable income. The reported incidence of poverty, at about 26 percent, is nearly three times the national average (SSB, 1993). This is consistent with there being a relatively high incidence of poverty in the areas which are officially designated as poor, from which our sample is drawn. It does not, of course, necessarily mean that most poor households are to be found in the designated poor areas (since the designated poor regions contain a small proportion of the total population).

### **3. Disposable Incomes and Decomposition by Source**

The shortage of natural factors of production as an explanation of rural poverty implies that the households with the lowest incomes obtain a large proportion of their income from agriculture and that they have relatively poor endowments of land. Taking the economy as a whole, scholars such as Chenery and Syrquin (1975) and Kuznets (1971) have shown that there is a close relationship between stages of

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<sup>2</sup> The transfer income includes the income transferred to non-rural households. Non-rural households refer to the households who are not registered as rural households in China's population registration system, even though they may live in rural areas.

**Table 2. Per Capita Disposable Income and the Incidence of Poverty , 1992#**

	1992 prices (yuan per capita)	1985 prices (yuan per capita)
Average official disposable income (yuan)*	613. 14	341. 41
Average adjusted disposable income (yuan)**	636. 81	354. 38
Official poverty line (yuan)	359.32	200. 00
World Bank's poverty line (yuan)***	347.01	193. 00
Poverty incidence under the official poverty line	29%	
Poverty incidence under the World Bank's poverty line	26%	

# All data are drawn from our sample

\* that is, cash income plus value of home produced goods

\*\* that is, official income plus net transfers and imputed annual value of own house

\*\*\* World Bank, 1992

Source: Sample survey data.

economic development and the structures of the economy. Traditional agricultural activities usually dominate poor economies whereas industry and service sectors constitute the main components in the richer economies. One can hypothesize that a similar relation exists between households within an economy, in that those with the lower incomes rely particularly on agriculture and those with the higher incomes rely more on income from the sale of services (including wage labour) and manufactured products. This hypothesis, however, receives no support from our data. Households in the bottom quintile of the income distribution received the same proportion of their disposable income from agriculture as did households with average income and those in the top quintile. The correlation coefficient for the relation between household income and the share of agricultural income was 0.44.

The households in the bottom quintile have the lowest levels of income from each of the income sources (including transfer incomes), not, as hypothesized, only from non-agricultural sources. According to our sample, household agricultural incomes account for over 65 percent of income for households in *every* quintile, indicating the dominant role of agricultural as a source of income in poor rural areas. Well-off households are predominantly so because they have more *agricultural* income (four times the per capita average of those in the bottom quintile) rather than because they have differentially large incomes from other sources. Employment income is three times as large at the top as at the bottom, but even then constitutes only 20% of the income of households in the top quintile.

A notable feature in Table 3 is that households in the lowest quintile have a higher proportion of income from employment and property than do those in the higher quintiles. This seems counter-intuitive: however, the absolute values of incomes from these sources are small. For most poor households, non-agricultural income comes primarily from craft making or other labour intensive industries, such as straw weaving and rice wine making. A high level of activity in this area probably reflects low marginal product in agriculture. Employment income from outside the households is mainly earned from temporary jobs in cities. For households in the

**Table 3. Sources of Per Capita Disposable Income (at 1985 prices)**

	<b>Bottom quintile</b>		<b>Top quintile</b>		<b>Average</b>	
	(yuan)	% of disposable income	(yuan)	% of disposable income	(yuan)	% of disposable income
Disposable income	153	100	616	100	354	100
Transfer income	-13	-9	-10	-2	-8	-2
	-10	-6	-4	1	0	0
Employt inc. (b)	40	26	117	19	71	20
Agric. inc. (c)	100	65	403	65	235	66
Non-agric income	12	8	67	11	31	9
Property inc (d)	15	10	39	6	26	7

a). Figures in brackets are calculated by using a different measure of transfer income. This method distributes taxes and payments from collectives to household agriculture and non-agriculture incomes in proportion to their costs.

b). Employment income is the income received from employment outside the household, mainly wages of temporary workers in cities and in rural enterprises.

c). Household agricultural income and non-agricultural income are the net incomes from agricultural and non-agricultural activities.

d). Property income is the income from property owned, mainly the imputed rental value from an owner-occupied house.

Source: Sample survey data.

bottom quintile, no one had a stable non-agricultural job in rural enterprises or cities (see Table 4). In contrast, although households in the top quintile have lower proportions of income from employment and non-agricultural sources, the absolute values of such income are much bigger than those received by poor households. And the index of stable non-agricultural employment is also higher than for the poor (although still very low). Table 4 shows that 41 percent of workers in households which had incomes in the lowest quintile of the distribution of income worked the equivalent of one or two months per year in non-agricultural employment outside the household. The comparable figure for the top quintile households was 34 percent. Thus low income households showed a greater propensity to look for opportunities for outside employment, but the rewards for doing so were low.

**Table 4. Non-agricultural Occupation Index\***

	<b>Bottom quintile</b>	<b>Top quintile</b>	<b>Average</b>
Non-agricultural occupation index	41.24	33.56	32.39
Stable non-agricultural employment index	0.00	4.28	1.87

\* The non-agricultural occupation index is calculated using the form

$I_{na} = 100 \cdot \frac{\sum S_j}{\sum L_i}$ , where S is the non-agricultural employment score; L denotes the total household labourers; i and j are the numbers of labourers involved in non-agricultural activities and all economic activities. S=3, if one spends most of his/her time (over half an year) on non-agricultural activities; S=2, if one spends less than half a year but still more than one quarter of a year on non-agricultural activities; and S=1, if one spends less than one quarter of a year and more than one month on non-agricultural activities. The stable non-agricultural employment index is calculated by the same method as for the non-agricultural occupation index. The only difference is that the non-agricultural occupations in which household workers are engaged are relative stable. This is interpreted to mean that they have been employed (or self-employed) for over 3 years.

Source: Sample survey data.

Property income, comprising imputed owner occupied house rental value, shows no significant difference between the bottom and top quintile households in terms of income shares. However, the absolute values are sharply different. This implies that higher income households also have substantially better housing, a point that is missed by the usual measures of income.

Average transfer incomes are negative at every quintile in the distribution of per capita household income. This is partly because all households pay a certain amount of income to the collectives they belong to in return for their use of collectively owned land and other facilities, such as irrigation, schools and other public services. The average such payment, which of course may be seen as a tax, is 28 RMB Yuan at 1992 prices (or 4.5 percent of average income).<sup>2</sup> It was beyond the scope of our survey to estimate at the household level the value of the communal benefits which these levies finance. Thus we cannot conclude that the net effect of communal taxing and spending is regressive. We can conclude, however, that (as in the public finance of most developed countries) taxes on average are not effectively progressive. In fact the taxes appear to be highly regressive, with households in the lowest quintile paying a higher *absolute* amount than those in the top quintile. Any

<sup>2</sup> Figures in Table 3 have been adjusted to the 1985 constant price.

progressive redistributive impact that there is must derive from the structure of communal expenditure.

Another cause of the negative transfer income is gifts transferred among households. In rural China, gifts (usually cash) are presented on many occasions, including weddings, funerals, foundation and finishing celebrations of new houses, newly born baby's one month celebrations, and so forth. This custom is deeply rooted in rural society and has a strong impact on family life. It is presumably intended to effect some horizontal redistribution to families at particularly expensive moments in the life-cycle. In our survey, 92 percent of households considered that the gifts they presented were as much as or even higher than those of others. (Note that questions were answered in the presence of local officials and we might expect households to be reluctant to admit to giving less than average). This may partly explain why households in the bottom quintile have a high proportion of the negative transfer income. This kind of transfer may even cause a household to fall below the poverty line. As transfer income has a strong impact on some households' living standards, it is important to consider this income in poverty studies. Of course, on average the amounts received will equal the amounts given and so this custom does not affect average household income. However it can change the distribution of income and may cause particular hardship for the poor if custom requires that they contribute at about the average level. There is a risk that rising inequality of income within rural communities will aggravate this problem.

The Gini index and the Theil index have been widely used to examine income inequality. However, in our study, the negative transfer income makes it inappropriate to use these indices. We therefore use the squared coefficient of variance to examine income inequality and its sources (Shorrocks, 1982). Table 5 shows the contribution, in percentage terms, that each source of income makes to the total inequality of household income. It is clear that agricultural incomes had a dominant role in determining differences in household income levels. It explained more than 60 percent of total income inequality. Employment incomes accounted for 18 percent of inequality. Transfer income only had a minor effect. This result further illustrates the importance of income from agricultural in determining the relative prosperity of households, although we note that only non-agricultural income contributed more to inequality than it did to average income.

**Table 5. Income Inequality and the Percentage Contribution of Different Sources of Income to Total Inequality**

Sources of Income	Percent of total variance
Disposable income	100.00
Transfer income	2.93

Employment income	18.09
Household agri income	60.77
Household non-agri income	12.82
Property income	5.38

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Source: Sample survey data.

To summarise, in poor rural areas, there is little difference in the proportion of income received from different sources for high and low income households. At all levels of the income distribution, agriculture is the dominant source of income, providing about two thirds of the total. Of course, the absolute differences in income between the top and the bottom are large. Agricultural income is also the main source of inequality in the income distribution. This suggests that, at present, the lack of non-agricultural opportunities is not the major reason for rural poverty, in the sense that the relatively well-off households are so predominantly because of higher agricultural rather than non-agricultural incomes. Thus, in order to understand why some households are much poorer than others, it is necessary to understand why the poor households have much lower agricultural incomes.

#### **4. Resources, Location and Incomes**

Three hypotheses were outlined in the introduction to explain why some rural households have higher incomes than others. The three hypotheses are not mutually exclusive and it is likely that all contain some truth. An interesting question is, if this is the case, what is the relative magnitude of each of the forces which they identify? It is possible, with our data, to examine, albeit in a rather crude way, which hypothesis has the greatest empirical weight.

In China, although many previous studies have also found that geographic conditions, such as climate, topography and accessibility, have strong effects on household incomes, quantitative analysis of the impacts of these factors on poverty are rare due to the lack of data. Aware of this shortcoming, our survey covered a wide range of information regarding resources and geographic conditions. It is, therefore, possible for this study to report a quantitative analysis of the relationships between inputs, resources, physical environment and rural poverty.

A function is estimated below in which household income is related to a variety of inputs:

$$Y=f(L, M, K, I, T, D, N, R1-R6)$$

Where: Y is household income; L, M, K, denote labour, land and capital inputs, respectively; I is a categorical variable where a higher number means that a higher proportion of household adults are illiterate; T is a dummy variable representing topography, with mountainous areas having the value 1 and other areas having the value 0, D is the ratio of dependents to productive adults in the household and N is the ratio of non-agricultural to agricultural income, and R1 to R6 are dummy variables for each county, which proxy average climate and remoteness. Duan county in Guangxi, the poorest in the sample, was the one omitted for comparison. The results are presented in Table 6.

**Table 6. Determinants of Household Income**

Variable	Coefficient	St Error	t ratio
Constant	950.67*	96.02	10.04
Labour	-74.26*	12.57	-5.91
Land	.39	2.53	0.15
Capital	0.08*	0.01	5.90
Topography	-125.78*	29.42	-4.28
Illiteracy	-63.01	47.59	-1.34
dependency ratio	-157.64*	20.92	-7.54
ratio of non-ag income	233.49*	61.12	3.9
Lanchang	43.31	53.22	0.81
Yi	66.41	65.33	1.01
Tonqui	-43.35	67.26	-.64
Shangzhou	213*	61.45	3.40
Zhijiang	-58.84	69.35	-.08
Wanzai	207.22*	68.43	2.03
R2	0.396		F stat 34

Source: Sample survey data

The variables which represent the first hypothesis, that poverty is caused by poor natural resources, are land, labour, topography and region. The estimated results show that, surprisingly, land has a marginal product which is not significantly different from zero. In order to make sense of this result, recall that the dependent variable is income from all sources and not just agricultural income and land itself has no direct effect upon non-agricultural incomes: it is not a substantial input and it cannot be sold by households. Furthermore, equalised distribution of land within villages, to some extent, diminishes the impact of land on household income disparities. Note also that households in the bottom quintile of the income distribution had above average quantities of land (see Table 7). It is very likely that this land is of below average quality, in ways which are not picked up in the variables in the equation.

Labour has a *negative* and significant marginal product: the marginal worker detracts from the income of the average household by 74 yuan. We cannot offer a plausible explanation for this result, since the income maximising household would leave unproductive workers sitting idle, rather than employ them in a way which reduces household income.

Support for the hypothesis comes from the significant effect estimated for topography and, in some cases, region. Note that the regional dummy variables are likely to capture some of the effect of topography, given that some regions are more mountainous than others. Thus the estimated 125 yuan reduction in income associated with living in a mountainous region is almost certainly an underestimate of the true negative effect.

The second hypothesis is that poverty arises from a failure of factors of production (specifically, capital and labour) to move out of low yield subsistence agriculture into more profitable opportunities. Capital has a positive marginal product, yielding an estimated 8 percent rate of return, and is a highly significant determinant of rural income in poor areas. Given that this is a nominal rather than real rate of return, it is probably below that of at least some opportunities elsewhere. The significance of the non-agricultural income index lends support to the second hypothesis. However, this conclusion must remain tentative. Table 4 showed that poor household had a higher proportion of workers in non-agricultural employment than did the better-off households. This implies that workers in poor households are willing to look elsewhere for work but find little reward in doing so. The problem may rest more with lack of opportunity than with immobility.

The third hypothesis was that demographic characteristics of the household induced poverty. These are represented empirically by the dependency ratio and the illiteracy rate. The extent of illiteracy has no significant effect whereas the dependency ratio is highly significant

The absence of a significant effect for the degree of literacy is a surprise. We can only speculate on the reasons for this result. One reason may be the strong role of traditional social structures, where production decisions are made by family elders, who in turn are the least likely to be literate. Thus the increasing average education of the younger generations may only become fully influential as they in turn reach the status necessary to contribute to major family decisions. A second reason may be that the technology used in farming and other household production is traditional and does not require very skilled labour to use effectively. The necessary skills are passed on from generation to generation in the traditional ways and are not greatly enhanced by classroom learning. A third possible explanation is that there is limited opportunity to work in employment outside the household, where literacy and other classroom learning may have a higher pay off. There is some support for this view in the fact that literacy has a noticeable impact on the poverty status of households in the non-mountainous regions, where alternative employment opportunities are greater. However, this is not so in the mountainous areas.

We conclude that there is support for each of the hypotheses, and that the apparent negative relation between number of workers and income and the absence of a positive relation between literacy and income remain as puzzles to be further explored.

A second way in which to explore the hypothesis that poverty is caused by possession of low levels of the factors of production is to look directly to see whether high income households are distinctively different from low income households in this regard. This we do in Table 7.

**Table 7. Resources by Income Level**

	<b>Land</b>	<b>Labour</b>	<b>Capital</b>	<b>Proportion of mountain areas</b>	<b>Loan per household</b>
	(mu)	(workers)	(yuan)	(%)	(yuan)
Bottom 10 %.	12.19	3.27	658.37	87.76	52.49
Bottom 20 %	9.98	2.94	685.76	80.61	72.54
Average	7.74	2.69	1120.91	59.18	126.18
Top 20 %	6.39	2.46	1517.04	37.76	221.20
Top 10 %	5.96	2.35	1612.49	42.86	225.75

Capital is measured as an annual input, assessed as depreciation of fixed assets plus current cash outlays on the use of capital.

Source: sample survey data.

Table 7 shows that the bottom 10 percent of households own *more* land (indeed, almost twice as much) and labour than the top 10 percent of households. However, they possess much less capital compared with the average and the top income households. Most of the bottom 20 percent of households are located in mountain areas whereas only about a third of the top 20 percent live under the same conditions. We infer from the surprising result that low income households have more land and labour, and that they are distinctly more likely to live in

mountainous areas, that the land they own is relatively unproductive.<sup>3</sup> This view is supported by the fact that, if we look only at households which live in mountainous areas, those in the top quintile own about one third more land than those in the bottom quintile. A second inference is that capital is highly complimentary with land and that the low levels of capital owned by poor households reduces the productivity of the land. This could be the case, for example, where the absence of transport capital made it very difficult to sell surplus product. It may also be that on average the labour in the poor households is applied with less skill than in the richer households, although any such differences in skill are not reflected in differences in formal education.

The explanations we have offered for the observation that poor households on average own more land than do richer ones are tentative. It would be of great interest in any future relevant surveys to include information on the quality of land, using, for example, the existing official land quality rating system.

The close relationship between capital and income levels implies that poor households are in a vicious cycle. Low capital results in low income, which in turn makes it extremely difficult to finance the purchase of capital from either savings or borrowings. As noted by Leibenstein as long ago as 1957, breaking this vicious cycle needs outside assistance. This assistance needs to be more sophisticated than simply urging households to borrow. As shown in Table 7, the bottom 20 percent of households had only one third the level of loans that the top 20 percent of households had in 1992. This is not surprising if the lending is left to those who must worry about the return to their funds. Poor people are not a good risk. There may be scope for a scheme whereby essential capital is rented rather than owned. Then all that the lender puts at risk is the rent for a defined term of lease, rather than the full value of the capital.

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<sup>3</sup> While the land allocation system does take account of variations in the quality of the land, its ability to equalize is limited by the fact that equalization occurs within the village but not between villages. When a whole village only has access to poor quality land, it cannot be compensated by the fact that a village some distance away has access to better quality land.

## **5. Impacts of Demographic Characteristics on Poverty**

The previous sections analysed poverty in rural China from the standpoint of the ability of households to generate income on and off the farm. In this section, we look at the effect of demographic characteristics on the propensity to be poor.

Table 8 and Table 9 show that low income households usually have larger families and somewhat lower proportions of workers. Poor households also have a higher illiteracy rate and lower primary admission rate for school age children. This may partly explain their lower labour productivity, although we note that in our earlier estimates education did not have a significant effect on income. Conversely, the top quintile households have a relatively small size and a low illiteracy rate. Labour productivity is more than five times higher than in the poor households. This feature indicates that the size of the household may have a significant impact on the household's living standards (recall that this is measured as *equivalent* household income, that is, it is adjusted for family size). The marginal product of an additional family worker may be particularly low for poor households who have a fixed amount of not very productive land and few opportunities for non-agricultural income (for example, who live in remote mountainous areas). To illustrate the point, suppose a) that the marginal product of labour in poor households was zero and b) that they had the same family size as the average or the top 20 percent of households have. Then the reduced family size would result in an increase in per capita disposable income of 13% and 36% respectively.

One reconciliation of the evidence that there is a large difference in education between high and low income households and yet there is a low marginal product for education is that education is primarily a consumption good. The low income causes the low level of education rather than the other way round.

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**Table 8. Family Size and Independence Rates for Different Income Groups, 1992**

Income Class (RMB Yuan)	SSB'S		Sample	
	Family size (person)	Independence* Rate	Family size (person)	Independence Rate
< 200	4.98	1.79	5.98	1.93
200-300	5.18	1.84	5.41	1.86
300-400	5.08	1.77	4.89	1.92
>1000	3.99	1.46	3.71	1.57
Average	4.71	1.66	4.73	1.76

\* Independence rate is total family numbers divided by the number of workers in the family.

Source: SSB, 1992. Sample survey data.

**Table 9. Illiteracy, Primary Admission, Labour Productivity and Per Capita Income, 1992**

Income Level Income	Illiteracy rate	Primary admission rate	Average labour productivity (yuan/labourer)	per capita per capita (yuan)
Bottom 10 percent	40.54	54.81	363.24	204.24
Bottom 20 percent	32.78	66.11	448.66	247.36
Top 20 percent	12.49	89.22	1669.39	1063.91
Top 10 percent	12.24	91.67	1966.40	1242.51
Average	20.75	79.66	1000.82	568.62

Source: Own survey data.

## **6. Conclusions**

The explanations of poverty that we identified in the introduction were a) low levels of factor endowments, b) immobility of labour and c) demographic characteristics of households. We are now in a position to assess the strength of the evidence in support of each of these explanations, as revealed from our data.

## Endowments

Consider first natural endowments. Poor natural resources are reflected in our data by mountainous topography and region. Region is taken to be a proxy for remoteness and climate, albeit an imperfect proxy.

There is some evidence in support of the view that poor natural resources is an explanation for low household incomes. First, 88 percent of households with the lowest incomes (ie, those in the bottom decile) live in mountainous areas. This compares with 60 percent for the sample as a whole. Households in the top decile are only half as likely as those in the bottom decile to live in mountainous areas. Second, other things equal, living in a mountainous area significantly reduces a household's income. Third, regional location matters. On our interpretation, this means that the natural environment of some regions was more benign than that of Duan, the poorest region, resulting in higher incomes. Fourth, variation in income from agriculture was the predominant source of inequality in income. A poor natural environment is particularly problematic for agriculture.

There is also evidence *against* the view that poor natural environment is a major determinant of poverty. First, 43 percent of households in the top decile of the income distribution live in mountainous areas. Something makes it possible for these households to generate relatively high incomes. It may, of course, be that the classification "mountainous" is too crude to pick up the essential role of poor natural resources. Here we should remind ourselves that households in the bottom decile have on average *more* land than other groups (although this is not true of households in the mountainous regions). This makes it likely that the land owned by the poorest is of inferior quality. In turn, this implies that there is considerable variation in the quality of land, even in mountainous areas. If so, it reduces that value of the classification of "mountainous area", not only for academic understanding but also for policy purposes. Second, although income does vary systematically by region, as with topography, the variance is quite small compared with the differences in incomes between households. Thus, *within* a region, there is still considerable income variance which must be explained.

We conclude that natural environment does matter, but it is by no means the whole story.

As expected, we found that other factor endowments do have a significant effect on levels of household per capita income. There are, however, several conclusions which are not obvious.

One is that education, as we measure it, does not have a systematic effect on income. While the poorest households have lower levels of education and literacy, relatively little education does not appear independently to cause their low income. Indeed, it may be caused by it, since acquiring education is expensive. We do not infer from this that education is without value for rural households. Education, particularly literacy, has an independent contribution to make to human well-being. This has been shown to be particularly so for women and their children, reducing vulnerability and improving health. It may also increase future labour mobility.

A second interesting conclusion is the low marginal product of land and labour. In partial explanation, we note that about 35 percent of household income in the sample comes from sources other than agriculture, for which land can be expected to be a minor input and labour the major input.

The third conclusion to which we draw attention is the high marginal product of capital. It seems clear that a major difference between high and low income households is the amount of capital they are able to employ. Given its high marginal product, the fact that low income households have little capital clearly points to this as one of the important sources of their poverty. Differences in available capital may help to account for the five-fold difference in the average productivity of workers in top decile as compared with bottom decile households.

### **Factor Mobility**

There is little support for the hypothesis that the chief source of high as compared with low income is mobility of household factors of production. First we note the important conclusion that the proportion of income received from household agricultural activity is both high (about two thirds) and varies very little with different levels of household income. Households in both the top and bottom quintiles each receive 65 percent of their income from agriculture. Thus the high income households are not distinguished by their having a greater opportunity or willingness to obtain income from non-traditional activities, or from activities which require mobility of labour or capital. Almost none of the households had members who had stable jobs outside the household. Low income households actually had a higher proportion of their labour time devoted to obtaining income from outside employment than did high income households. The absolute value of this income, however, was much lower. The key distinction between low and high income households is *not* the distribution of effort among agricultural, non-agricultural and outside employment. It is rather that the return to *all* these activities is higher for the high income households. This suggests that labour in the high income households is more productive, in a range of activities. One

reason may be higher levels of education. Another is likely to be the much larger average quantities of capital they have to work with.

### **Household demographics**

It is clear that the poorest households have much higher levels of illiteracy than do the relatively well-off. Whether this *causes* their lower income is less clear, as noted earlier. We take their lower propensity to send their children to school to be because they cannot afford the cost. However, it may also reflect a judgement as to the low pay-off to schooling.

Poorer households also have higher ratios of dependents to workers. If the households in the bottom quintile of the income distribution had the same dependency ratio as those in the top quintile then their per capita income would on average be about 36 percent higher. Dependency ratios vary across the life-cycle. People become infirm with age and children are born. Old people die and children become adults. Thus an adverse dependency ratio is unlikely to cause a household to permanently be poor. Rather, it is likely to cause households which are on the margin of poverty to dip in and out of that state over the life-cycle.

To summarise, the evidence from our data offers support for two of the three hypotheses with which we started, but even then the support is qualified. The two supported hypotheses are that endowments, both natural and man-made, matter and that high dependency ratios reduce per capita income. Of the two, by far the greatest weight must attach to the first. The chief qualification comes from the fact that there is considerable variance in income *within* the hypothesised categories. We *can* say that the chances of being poor are very high indeed for a household which is in a mountainous area, has little capital and has a high dependency ratio.

Finally, we note that the net effect of transfer incomes is regressive. Poor households paid almost same absolute amount to collectives for services and in various social contacts as did higher income households. While the total level of transfer payments is not large, at the margin they have the capacity to add substantially to the economic distress of the poorest households.

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To further explore relationships between the population characteristics and income levels, we use a simple demographic economic model to disintegrate the impacts of population size and dependent rate on per capita disposable income. The model is expressed as follows:

$$y=Y/P \quad (1)$$

$$=(Y/L)/(P/L) \quad (2)$$

$$=P'/D \quad (3)$$

Where: y is per capita disposable income. Y is total household disposable income. P and L denote household population and labour respectively. P' and D are labour productivity and dependent rate.

**Table 12. Impacts of Family Size and Dependent Rate on Per Capita Income**

	Bottom 10 percent household			Bottom 20 percent household		
	Original	Adjusted	Change %	Original	Adjusted	Change %
With family size of top 20 percent	204.24	297.37	45.60	247.36	337.08	36.27
With family size of top 10 percent	204.24	315.34	54.40	247.36	357.45	44.51
With family size of average	204.24	247.59	21.22	247.36	280.66	13.46
With dependent rate of top 20 percent	204.24	231.50	13.34	247.36	285.93	15.59
With dependent rate of top 10 percent	204.24	229.52	12.38	247.36	283.50	14.61
With dependent rate of average	204.24	206.38	1.05	247.36	254.91	3.057

Source: Own survey data.

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