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# **The Causes of Transient Poverty and its implication to Poverty Reduction Policy in Rural China<sup>1</sup>**

**Ximing Yue**

The Institute of Economics, Chinese Academy of Social Sciences (CASS)

**Shi Li**

The Institute of Economics, Chinese Academy of Social Sciences (CASS)

**Pingping Wang**

Division of Regional Program, Rural Survey Organization,  
National Bureau of Statistics (NBS)

## **Abstract:**

The study focuses on two components of total poverty: chronic and transient poverty and made an investigation of their relative importance in total observed poverty, as well as the determinants of each component. We found that the transient poverty account for large proportion of total poverty observed in the poor rural area of China. By analyzing the determinants to two types of poverty, we found demographic characteristics of households, such as age of the head of households, family sizes, the labour's proportion in the number of family numbers, and educational level of the head of the households are very important to the poverty status of households. These factors matter more to chronic poverty than transient poverty, and have greater impacts on the poverty measured by consumption than that measured by income. Besides the demographic factors of households, other households' factors, like physical stocks, the composition of income and the amount of cultivated lands, also have significant effects on both chronic and transient poverty. It is also confirmed that change in cash holding and saving and borrowing grain are used by rural households to smooth their consumption. Attributes of community where the households reside are important to poverty.

With very few exceptions, we did not find that poverty program have significant impact on poverty reduction at the households level. We interpreted this as the poverty program benefiting more to the wealthy than to the poor in the poor area. The main reason for this could be poor targeting of poverty program.

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## 1. Introduction

After more than two decades of tremendous reduction of poverty China has only small number of poor people in rural area. According to official estimate, rural population with income below poverty line dropped from 250 million in 1978 to about 30 million in 2002, from 30 percent to 3 percent as proportion of total rural population. While the very small number of the rural poor largely depends on severe official poverty, substantial alleviation of rural poor can also be observed even though much less severe poverty is applied. World Bank has set up 1 dollar per day poverty for international comparison, which is often referred to as international poverty line. Application of the international poverty line produces a poor population of 280 million in 1990 and about 85 million in 2002, or 31.3 percent in 1990 and 10.9 percent in 2002,<sup>2</sup> indicating relatively smaller number of the poor than ever.

Poverty profile changes substantially as size of the poor in rural China is getting small. Unlike the situation in the beginning of 1980s where the poverty universally spread over rural area in China, regardless of the regions, family size, educational level of family members, and so on, the remaining poverty at present has been known to have the following features. First of all, the existing poverty is regionally concentrated on western area where quality of the land is so poor that it hardly provides subsistence level of agricultural production. According to estimates by World Bank southwestern provinces account for 41.2 percent remaining rural poverty and northwestern provinces 28.4 percent in 1996.<sup>3</sup> Secondly, minority people represent disproportionately the remaining poor. Most of the minority people remain poor because of their concentration on mountainous counties in the western provinces, also because their disadvantage at Chinese language prevents them from sharing benefit from high growth of economic growth in China. Thirdly, some demographic features are also responsible to the remaining poverty. The poor households, for example, tend

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<sup>2</sup> Figures from 1990 come from World Bank (2001) p. 2 and those for 2002 are based on author's calculation.

<sup>3</sup> World Bank (2001) Table 1.2 p. 4.

to be those headed by persons with low educational level and those with large size of family members. A large number of households fail to escape from poverty just because of disability or serious disease of main household member(s), thus causing the lack of labour in the households.

Such information on the features of existing poverty is essential for understanding of poverty and policy design of poverty reduction. Spatial concentration of remaining poverty, for instance, is the most important information that lead central government in China to implement a regional targeting poverty alleviation program. Even though we have some good information about features of existing rural poverty, we are still lacking knowledge of rural poverty in China at present in some aspects. One of them is dynamical aspect of poverty. That is, is current poverty transitory or chronic? The poverty alleviation program has been aiming to reduce the rural poverty through raising general income level of residents of poor area in the rural area, especially the poor. Is such policy proper or most effective for the remaining poverty in rural China? Our knowledge of the dynamics of poverty is crucial to answer this question, as two types of poverty seem to have different causes and require different remedies for reducing them. The transient poverty, for instance, is mainly due to income fluctuation, and some measures that help household smooth variation of income will be most effective for reducing it. The poverty reduction program implemented so far by governments in China, which aims to raise long term income level of the rural poor, may not be the most effective policy if transient component accounts for most part of the remaining poverty. Unfortunately, we are still lacking a good knowledge of transient and chronic distribution of current poverty in rural China. This study intends to fill the gap by decomposing aggregate poverty index into its transient and chronic components and examined which part is more important in existing poverty. By running multivariate regression we also investigate causes of each part of two types of poverty at household level.

Besides tremendous reduction of poverty during more than two decades in the

past, the huge poverty alleviation program is another factor that attracts great attention, as far as rural poverty is concerned for China. Rural economic reform initiated in the end of 1970s realized growth potential in rural area that was suppressed by planning economic regime prior to the beginning of the reform and brought about rapid economic growth, as well as dramatic reduction of poverty before 1984. As this potential exhausted and economic reform shift from rural to urban area, decline in the rural poor began to halt since 1985. This was the principal reason why the central government in China decided to launch comprehensive poverty alleviation program in 1986. Poverty program has been characterized by regional targeting from the beginning.<sup>4</sup> That is, the program has been carried out by first designating some counties as nationally poor counties and then channelling entire poverty funds into the counties declared as nationally poor counties. There have been three rounds designation of nationally poor counties took place in 1986, 1993 and 2001 respectively. The number of counties designated as nationally poor counties increased from 258 in the first designation to 594 in the second, and kept unchanged in the third.<sup>5</sup> While coexistence of tremendous decline in rural poverty and huge poverty alleviation funds have often been cited as evidence that poverty program contributed to alleviation of rural poverty, effectiveness of poverty program remains controversial. Did the program really help reduce the rural poverty so far? If any, to what extent and how it helped in reducing the poor in rural China? These questions are not answered properly. Previous works show that growth rates of income and consumption per capita in counties that are designated as nationally poor counties are higher than those in counties that is not, and based on this, concluded that poverty program contributed to reduction of rural poverty.<sup>6</sup> The judgement, however, is questionable as the contribution of poverty program to the rise in general level of income or consumption

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<sup>4</sup> For detailed explanation see, for instance, World Bank (1992, 2001), Park, Wang and Wu (2002), Zhang, Huang and Rozelle (2003), and Yue and Li (2004).

<sup>5</sup> For detailed explanation of three rounds of designation and their accuracy see Park, Wang and Wu (2002) and Yue and Li (2004).

<sup>6</sup> See Park et al. (2002), for instance. Also refer to next section for review of previous works on evaluation of impacts of poverty program implemented in rural China.

in a national poor county doesn't necessarily mean the rise in income or consumption of the poor in the poor county. The program may benefit much to the rich but little to the poor in the poor area, which is the point people often take. Therefore, the right way of assessing the impact of the program is to link the program to some poverty measures, incidence of poverty for instance, but not to aggregate measures such as income and consumption per capita of county as a whole.

As by-product of examining the determinants of transient and chronic poverty, this study evaluates the impact of poverty program on alleviation of poverty by including as explanatory variables the poverty funds that received by counties where the households reside and the subsidized loan directly received by households. By linking the poverty funds directly to poverty measures, transient and chronic poverty measured at household level, this study is able to assess the impact of poverty reduction.

The rest of the paper proceeds as follows. Section 2 provides overview of previous works on rural poverty in China, with the aim of explaining why this study should be done. Section 3 introduces methodology of decomposing aggregate poverty index into transient and chronic poverty, both at household level and for the households as a whole. Description of data used in the study is also given in the section. Section 4 represents a result of decomposing aggregate poverty into its two components for entire households. The decomposition is made by age and educational level of the heads of households, the family size and region, with intention to see if these factors are linked to measured poverty. Following decomposition of poverty index for the entire households, section 5 makes the same decomposition at the household level and treats the results as explained variables to examine causes of the poverty. Section 6, final one of the paper, summarizes the main results of the study.

## 2. Previous works on rural poverty in China

Tremendous decline in rural poverty and the huge poverty program, as mentioned above, have drawn a great attention so far and lead to a large number of works on this issue. For the purpose of the study, which aims to investigate the cause of two types of poverty, the review of previous works given below is confined to studies on the dynamics of poverty for rural China. In addition, we also reviews previous works on assessment of impact on the poverty reduction of poverty program implemented by government in China, because quantifying the effectiveness of the poverty program represents important part of the study. Let's begin with review of works on the dynamics of the poverty for rural households in China.

People have so far been paid close attention to the dynamics of poverty, because the poor identified by one-year accounting period data is a very mixed and heterogeneous group. Some of the poor may be just transitorily poor due to temporary reasons like income variation, while others of the poor are persistently poor because of long-term low income that are hard to be raised by the families. Making distinction between the transitory poor and persistent poor is certainly important, not only in understanding of the nature of poverty, but also in designing an effective policy for reducing them. Several measures have been proposed so far, in order to measure the poverty dynamically. It is beyond scope of the study to review all the measures.<sup>7</sup> We choose method proposed by Rodgers and Rodgers (1993). Perhaps the most appealing features of this approach is that, based on concept of permanent income and using FGT index (a poverty index proposed by Foster, Greer and Thorbecke, 1984), the method defines transient and chronic components of aggregate poverty in continuous manner and captures severity of poverty.<sup>8</sup>

Turning to relevant works for rural China, few researches have been done to

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<sup>7</sup> For short but very excellent surveys of measures of poverty dynamics, see Bane and Ellword (1986) and Rodgers and Rodgers (1993).

<sup>8</sup> See Rodgers and Rodgers (1993) or next section of this paper for details of the method.

examine the dynamical feature of poverty in rural China due to availability of data. Using panel data at household level from four provinces in southern China, Guangdong, Guangxi, Guizhou and Yunnan, Jalan and Ravallion (1998b), decomposes aggregate poverty index into chronic and transient poverty and finds percentage of transient component in total poverty is 49.39% on average (sample mean), but varies with family size, with educational level of the head of household and so on. The method of decomposing the total poverty index into its transient and chronic components is very similar to that proposed by Rodgers and Rodgers (1993). Using the same data set, Jalan and Ravallion (2000) makes an investigation of the causes of poverty through regressing each of transient and chronic measures constructed at household level on a same set of demographical characteristics of sample households and geographical features of communities where the sample households reside. The most important message conveyed by the study is that the two types of poverty are caused by different factors, thus requiring different policies for reducing them. Moreover the study demonstrates that the cause of transient poverty is much more difficult to be explained by model estimated than that of chronic poverty.

Our study resembles Jalan and Ravallion (1998b) in purpose, to look at dynamical feature of rural poverty in China, and in method of decomposition as well. Our study is also broadly similar to Jalan and Ravallion (2000), again, in purpose, to examine the causes of both transient poverty and chronic poverty, and in econometrical technique used for estimation. However, our study differs from the two works in several aspects. The first difference lies in data set. Data used in Jalan and Ravallion's works comes from regular annual household survey, which consists of 5,854 sample households of four provinces in southwest China and cover six years from 1985 to 1990. As sample of regular household survey, the sample households come from both wealthy and poor counties of the four provinces. The data set used in our study, on the other hand, comes from the Poverty Monitoring Survey (PMS) that consist of more than 50,000 households, of which, about 16 thousands households are identified as

continuous and form panel data set that is used in our study. Since all the sample households in PMS come from the poorest counties in China, analysis based on the data set is able to capture situation of poverty for whole poor rural area in China. In addition, the PMS data set covers five years period from 1997 to 2001, and a research based on such data set can provides us with relatively late information on rural poverty. Another difference between our study and Jalan and Ravallion come from the use of welfare measure. Two works by Jalan and Ravallion conduct the analysis based on consumption. It is quite right employing consumption as welfare measure in analysis of poverty, because of general recognition of superiority of consumption over income as welfare measure. In spite of this general rule, inclusion of income as welfare measure in an analysis of poverty certainly improves our understanding of poverty. We give two reasons here. First, due to savings and borrowing behaviours of households the poverty measured by consumption differs from that measured by income. And comparison of consumption-based poverty and income-based poverty allow us draw some information about whether and extent to which the households smooth their consumption in the face of income variation. Second, since consumption-based poverty measures are differ from income-based poverty, it is highly likely that certain factor may has clear impact on the income-based poverty but not on the consumption-based poverty. This is especially important in evaluating impact of poverty reduction program. Chen and Ravallion (2003), performing an assessment of impact of World Bank's Southwest Poverty Reduction Project (SWPRP), finds the impact is much greater on income-based poverty index than consumption-based one, because households in beneficiary villages save large proportion of short-term gain from the project. We also find, as presented in section 4 of this paper, big difference between poverty index based on consumption measure and those based on income measure.

Turning to review of works on the impact of poverty reduction program implemented by Chinese governments for rural China, several works have been done



so far, but leave assessment of true impact untouched. Using county level data and employing two methods, growth regression and propensity-score matching, Park et al. (2002) finds growth rates of income per capita in designated nationally poor counties were higher than those in non-nationally poor counties by 2.28% per annum during 1985-1992 and by 0.91% during 1992-1995. Using household level data and by estimating consumption-growth model,<sup>9</sup> Jalan and Ravallion (1998a) found that the rates of consumption growth of households living in nationally poor counties would be lower than if the counties they reside were not designated as nationally poor counties, and, based on this, concluded that the program has succeeded in preventing consumption of households in program-targeted counties from decline, which would happened if the counties were not targeted by the program, but not enough to raise the rates of consumption growth above households living other counties due to unfavourable initial conditions in nationally poor counties. Using county level data from Sichuan province, Zhang et al. (2003) finds the poverty program contributes growth of average income of designated poor counties as a whole relative to the poor counties but not designated. They also argue contribution of the program on reduction of poverty by logical that program contributes on economic growth and the economic growth promotes the poverty reduction.

All the evidences provided by the three works above can be misleading in assessing the true impact of poverty reduction program. The reason is simple. They don't link the program directly to poverty measures such as incidence of poverty, but to general level of income and consumption instead. Contribution of the program to rises in general level of income or consumption per capita in designated nationally poor counties is not equivalent to contribution of the program to alleviation of poverty, as the program may benefit more to the rich than to the poor within designated poor counties, which people always argue on the grounds that the poor is at a disadvantage in access to poverty funds.

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<sup>9</sup> The data on household is the same as those used in Jalan and Ravallion (1998a) and Jalan and Ravallion (2000).

Perhaps the best work that has been done for assessment of impact poverty program in rural China is Chen and Ravallion (2003), a study of evaluating effectiveness of World Bank's Southwest Poverty Reduction Project (SWPRP). The SWPRP has been implemented in three southwest provinces, Guangxi, Guizhou and Yunan over period of 1995-2001. The data used in the study come from monitoring survey conducted for the project, which collects data on households not only in project villages, but also in non-project villages served as counterfactual to project villages. By comparison of propensity score matching estimates of incidences of poverty between project villages and non-project villages, the study finds that, while impact estimates are quite sensitive to choice of outcome indicators, poverty line and also to matching methods, the impact is much greater at lower poverty line and much larger on income than consumption as welfare measures. The reason they give for the greater impact on income-based outcome indicator than consumption-based one is that, uncertainty about the project's impact make it hard for participants to infer the gain in permanent income, so they saved a large proportion of the short-term gain.

Ideally, the evaluation of project impact should be made, just like what Chen and Ravallion (2003) did, by comparing propensity score matching estimates of incident of poverty between treated group and control group. Such exercise has not done for China with the exception of Chen and Ravallion (2003), mainly due to data availability. Our study here is unable to implement the ideal method too, for the same reason of data availability, as we only have data on treated group but no control group. Instead, this study tries to link poverty measures at household level to poverty funds per capita of nationally poor counties where the households reside and the subsidized loans that households receive directly, seeing whether the poverty funds matter to poverty status of the households or not. It is clear that our method makes the evaluation of program impact by linking poverty funds directly to poverty measures.

### 3. Methodology and data source

Procedure of examining the determinants of poverty involves two steps. The first is to measure the aggregate poverty and its chronic and transient components, and based on the measures, the second step is to investigate their causes through estimating econometrical models.<sup>10</sup> In the rest of this section, we first give a brief explanation of poverty measures and some econometrical issues of estimating the determinants of poverty, and then go on to explain the data used in the study.

Measures of aggregate poverty and its transient and chronic components used in the study are explored originally by Rodgers and Rodgers (1993). In their work, aggregate poverty index, denoted by  $A_p(T)$ , and its chronic component, denoted by  $C_p(T)$ , for entire households are defined first, and the transient component of aggregate poverty, denoted by  $T_p(T)$ , is then defined as difference between the total poverty index and its chronic component, i.e.  $T_p(T) = A_p(T) - C_p(T)$ .

Rodgers and Rodgers (1993) has only defined total poverty index and its chronic and transient components for the total population, but it is clear that the definition is applicable to each individual in the total population. As a formula of poverty index, the squared poverty gap (SPG) proposed by Foster et al. (1984) is used, because of its additive decomposability by population group and other desirable properties. It would be convenient to define poverty gap before defining poverty indexes. The poverty gap of individual  $i$  at the time  $t$  is defined as  $g_{it} = (1 - \frac{y_{it}}{z})$  when  $y_{it} < z$  and  $g_{it} = 0$  if  $y_{it} \geq z$ .  $y_{ij}$  here represents indicator of well-being, which is either income or consumption.  $z$  refers to the poverty line. Based on poverty gap the total poverty index of individual  $i$  over time can be defined in the following:

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<sup>10</sup> Jalan and Ravallion (2000) employed this approach to investigate the determinants of both transient and chronic poverty using data from four provinces in China.

$$A(iT) = \frac{1}{T} \sum_{t=1}^T g_u^2 \quad (1)$$

where  $T$  is the number of time periods observed. Similarly, the chronic poverty index is defined in the following based on permanent income of individual  $i$ :

$$C(iT) = \begin{cases} \left[1 - \frac{\hat{y}_i}{z}\right]^2 & \text{if } \hat{y}_i < z \\ 0 & \text{if } \hat{y}_i \geq z \end{cases} \quad (2)$$

where  $\hat{y}_i$  denotes permanent income of individual  $i$  which, in practice, usually is

estimated as mean of income of the individual over time,  $\bar{y}_i = \frac{1}{T} \sum_{t=1}^T y_{it}$ . Transient

poverty then is defined as difference between the total poverty index and its chronic component as follows:

$$T(iT) = A(iT) - C(iT) \quad (3)$$

It is clear from the two equations above that the measure of transient poverty is constructed to reflect the variation in household consumption during the years observed, while the measure of chronic poverty is compiled based on the average of consumption over time.

The aggregate poverty index and its chronic component for total population can be defined as sum of the aggregate index and chronic part at individual level over all individuals:

$$A(T) = \frac{1}{n} \sum_{i=1}^n A(iT) \quad (4)$$

$$C(T) = \frac{1}{n} \sum_{i=1}^n C(iT) \quad (5)$$

where  $n$  refers to the number of individuals of total population. As in the case of defining transient poverty for individual, the transient poverty for the entire population is then measured as difference between aggregate poverty and its chronic component. That is,

$$T(T) = A(T) - C(T) \quad (6)$$

Turning to strategy of examining the determinants of two types of poverty, the right approach to do this is to estimate Tobit model, as poverty indexes are censored at zero. That is, there is no negative value in poverty measures by definition. Maximum likelihood estimate of Tobit model, however, has been known as inconsistent and inefficient in the presence of heteroscedasticity and non-normality of error terms by Arabmazar and Schmidt (1981) and (1982). This study uses Least Absolute Deviation estimator for the censored data (LAD estimator) proposed by Powell (1984)

In order to observe dynamic patterns of poverty and examine determinants of its two components, information on income, consumption, and some geographical features at household level over time is required. In other words, panel data are absolutely needed to carry out this study. One of data sets that can meet this requirement, to our knowledge, is one obtained from Poverty Monitoring Survey (PMS). The survey, aiming to monitor the changes in incidence of poverty and its geographical distribution, has been conducted by National Bureaus of Statistics (NBS) since 1997 and collected comprehensive data on households, villages and counties in the 592 nationally designated counties. The survey contains five questionnaires, of which one is for county, one for village, and three for household and individual. The county questionnaire contains questions about various sources of poverty reduction funds and their spending, while the village questionnaire was designed to collect some information of each village on geographical feature, infrastructure, population, and labor force. The three household questionnaires cover the characteristics of each individual such as sex, age, current employment status, education and the information on households' income, consumption, assets, debts, and so on.

PMS has been carried out annually for 5 years from 1997 to 2001. The most advantage of the survey is that it has a large size of sample, which is more than 50,000 households, and the most sampled households can be built into panel data over three years at least.

#### 4. An overview of aggregate poverty index and its chronic and transitory components

Although discovering causes of chronic and transient poverty is main purpose of this work, it is useful to gives an overall picture of composition of aggregate poverty here. In calculating aggregate poverty index and its transitory and chronic component we use both income and consumption as measure of welfare, for the reason described in section 2 above. Two poverty lines are applied: Chinese official poverty line and the poverty line set up by World Bank. The Chinese official poverty line is 625 Yuan at 2000 price, and it is widely believed to be underestimated.<sup>11</sup> Table 1 presents the results. Several patterns can be seen from this table.

Table 1 inserted here.

First, given poverty line the aggregate poverty index and its components based on consumption are well above those based on income, implying households save part of their income. It should be noticed that this may not the whole story. If the poverty line applied is low enough, poverty measures based on consumption can be lower than that based on income, due to negative savings. That is, households could fund their consumption from other income sources, withdrawal of savings for instance, in the face of temporary drop in income. This point will be confirmed below. Secondly, the proportion of transient poverty in aggregate poverty index based on income measure is much higher that based on consumption, regardless of poverty line, and the proportions declines as poverty line goes up, regardless of whether income or consumption is used as measure of welfare. This implies chronic poverty as share of total poverty goes up with poverty line. Finally, while all the poverty measures, except

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<sup>11</sup> The reason that the Chinese government adopts an underestimated poverty line is to make a balance between the magnitude of poverty in rural area and the limited amount of fund for poverty reduction. Application of much lower poverty line can identify the poorest in the rural area, and poverty fund can be more effective to target the limited funds at the poorest.

for transient poverty based on income, rise with poverty line, extent of the rise is significantly different between poverty measured based on consumption and that based on income. Chronic poverty on the basis of consumption, for instance, increases by early 4.5 when poverty changes from 625 Yuan to 874 Yuan, while that based on income by 2.8 times, suggesting different sensitivity of two types of poverty. In order to explore this further, we calculate aggregate poverty and its transient and chronic component by 10 interval of poverty line within a range from 300 Yuan to 1,500 Yuan. Figure 1 – Figure 3 represent the results for aggregate poverty, chronic and transient poverty respectively. Clear picture of sensitivities of poverty measures to poverty lines emerge from these figures. The consumption-based aggregate poverty is below income-based one for lower poverty lines but above for higher poverty line. The two lines cross at poverty line of about 990 Yuan.<sup>12</sup> The same pattern is also observed for chronic part of the poverty, but with much lower poverty line, about 580 Yuan, at which consumption-based and income-based chronic poverty cross. Consumption-based chronic poverty exceeding income-based one for very low poverty lines provides clean evidence of smoothing behavior of rural households. As for transient poverty, consumption-based one rises with poverty line for lower poverty lines, while income-based one declines substantially, due to negative income. The most interesting thing, however, might be stability of both for higher poverty lines. Even though not explicitly demonstrated here, chronic poverty as share of total aggregate poverty increases with poverty line, while share of transient poverty decreases with poverty line, regardless of consumption or income used as welfare measure.<sup>13</sup>

Either aggregate poverty or its chronic and transitory poverty might vary, depending on demographical features of households such as age and educational level of the heads of households and the household size. Table 2 – Table 4 provide these

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<sup>12</sup> The income-based aggregate poverty declines until poverty line of around 700 Yuan. The poverty measure is strictly increasing function of poverty as long as income is positive, and the decline observed is just due to negative income.

<sup>13</sup> One thing that should be noted here is that, transient and chronic composition of total aggregate poverty estimated in the study is roughly consistent that obtained by Jala and Ravallion (1998b), but exact comparison is impossible due to sample, poverty lines used and so on.

information respectively. In addition, we present in Table 5 the same information by region as well. By making use of decomposability of poverty measure by population group, these tables also show contribution of each group to total poverty measure. The three tables are calculated with 874 per capita per year as poverty line and consumption as well-being indicator.

It is clear from Table 2 that poverty measure forms U-shape with age of the heads of households, irrespective of total aggregate poverty and its components. However, age interval for which the poverty measure reaches its lowest point is a little different between two components of aggregate poverty. Transient poverty is lowest for households with the heads aged 36-40, while Chronic one reaches its lowest point for households with their heads aged from 40 to 45. It is not hard to understand why the poverty is lowest for the households with the heads aged around 40. This is not only because these heads of households are still at physical advantage, but also because they accumulate some physical assets and experiences since married. It should be also noted that, while the households with the heads aged around 40 have the lowest poverty, but such households account for most part of remaining poverty, mainly due to their large proportion of the households in total population.

Table 2 inserted here.

Table 3 presents a profile of aggregate poverty and its two components by the educational attainment of the heads of households. The aggregate poverty measure, as shown by the table, drops as the heads of households get higher educational level, so do the chronic and transitory poverty. This suggests a significant effect of education on poverty reduction. Moreover, it seems that the educational attainment of heads of household has a much stronger impact on the chronic poverty than on the transitory poverty, thus leading to increase in proportion of transitory components in aggregate poverty as heads of household acquire higher education. Poverty experienced by



households headed by those with primary education accounts for nearly half remaining poverty. This is due to large share of such households in total population.

Table 3 inserted here.

Table 4 presents aggregate poverty and its chronic component by the household size. It is clear from the table that chronic poverty has strongly positive correlation with the size of households, while transient poverty is lower for households with 3 members than for others. This confirms a long-standing belief that a large family is more prone to fall into poverty.

Table 4 inserted here.

The Table 5 gives the information on poverty measures by region. The three regions' grouping is used to subdivide the all samples: the Eastern, the Middle and the Western. The regional pattern of poverty is consistent with what one has expected. The poverty is less severe in the East because of its more advanced development, while proportion of the transitory component in aggregate poverty is much higher in the eastern than in other two regions. The magnitude of poverty in the West, the poorest area in China, is slightly higher than in the Middle, simply because per capita income in the former is lower than in the latter. The composition of aggregate poverty is much similar between the two regions. From the decomposition by population group it is evident that poverty observed in the west and the central accounts for almost all the poverty of the total sample.

Table 5 inserted here.

## **5. The determinants of transitory and chronic poverty in Rural China**

This section is to estimate the determinants of two components. Factors that we consider to be important to poverty fall into four categories. Appendix Table provides a detail on how these variables are constructed and what expected signs of their estimates are.

The first group of explanatory variables contains demographic characteristics of households, such as the age of household head, the number of household's members, the educational attainment of household head, and the proportion of labour in household. These variables might have different effects on chronic poverty and transient poverty. Higher educational attainment of the heads of the households, for instance, might have a significant impact on reduction of chronic poverty, but may have no, or less effect on reduction of transitory poverty.

The second set of variables concerns other characteristics of households. We consider six factors here, based on both economic theory and data availability. The first one is physical stock cumulated by households for production. The family with more physical stock should be likely to be non-poor. The second one is amount of lands cultivated by households. Since cultivated land usually is not a source of higher income for rural families, due to intrinsically lower productivity of the agricultural sector, the lands should not be positively related to income level of households. It means that the amount of land will not contribute to poverty alleviation measured by income. However, there is wide consensus about security function of land in rural area, especially in the poor rural area. If this is true, amount of lands in per capita term should be important to poverty measured by consumption.

The third one is related to composition of income sources for rural households. Composition of income sources is an important to income level of households in rural China. Income of rural households in China comes from four sources: wage income, income from household operations, assets income and transfer income. Of the four sources, the first two not only make most part of rural households' income, each of

them as share in total income is also important. Wage income is source of higher income for rural households, and a household usually is rich one if its member(s) have chance to access this source of income. Conversely, income from households operations, mainly consisting of several agricultural production activities such crop growing, fishing and so on, usually provide very low income. A household, therefore, usually is poor if it relies heavily on the source of income. To capture possible influence of such composition of income sources on poverty status of households, income from households operations as a share of total income is incorporated into independent variables. Households with high share of operation income in the total are expected to be poor.

The rest of the six characteristics of households include change in cash holding and savings, grains borrowed from neighbour and remittance from members of households who migrate out for working. These factors are included as independent variables with the intention of capturing measures used by households for consumption smoothing, which is observed in previous section. The first two are measures that households can readily take when their current income are not enough for supporting basic daily needs, as long as there are some cash and savings available or it is possible for them to borrow. The third one will have an uncertain effect, compared with the first two. While the remittance from migrant members are expected to response to the shortage of money occurring in their rural home, this may not take place if migrant members are unable to find jobs in the city, or the employers fail to pay the migrant workers, a situation often observed in migrant labour market. It should be noted that each of the three variables is expected to be more related to poverty measured by income than that by consumption.

The third group of variable are incorporated to capture the effects of community features on the poverty. Undoubtedly, both economic conditions and geographical features of a community are very important to poverty status of households that reside inside the community. The problem here is difficulty in including all the attributes of

the community into analysis, due mainly to the incapability of statistics to captures all the factors. Our strategy for overcoming the difficulty is inclusion of net income per capita of each county and its average annual growth rate, in addition to two explicitly incorporated two villages' factors in the following. The one is enterprise dummy variable, taking on value of 1 if there is any enterprise in the village where the households reside and 0 otherwise. This variable is expected to have an negative sign of estimate, meaning positive contribution to reduction of poverty. The other one is geographical dummy variable, taking value of 1 if the village is in mountainous area and 0 otherwise. This variable would have positive sign of estimate, which means negatively contribute to alleviation of poverty.

The fourth set of variables is designed to evaluate the impact of poverty reduction programs on poverty alleviation, which is one of main purposes of the paper. In doing so a little more description of how the program have been implemented so far is required for interpreting the empirical results we will find later.

As mentioned in section 1, poverty alleviation program in China started from the middle 1980s, and its key feature is regional targeting. That is, the program is implemented through first designating some counties as nationally poor counties, and then providing the total poverty funds to the designated counties.<sup>14</sup> Three rounds of designation have been so far taken place, in 1986, 1993 and 2001 respectively. In each designation, nationally poor counties are selected mainly based on net income per capita of the counties, while some political factors are taken account. Revolutionary area, counties with large number of ethnic minority residing and remote area have received favourable treatment.<sup>15</sup> In the second round designation, the number of nationally designated poor counties increased to 592 and kept unchanged in the third designation.

There have been three subprograms through which the poverty funds provided by

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<sup>14</sup> It is means that the poor living outside the national poor counties receive no attention from the poverty reduction program. This has been criticized by many researcher, Riskin (1994) and Would Bank (2001) for instance.

<sup>15</sup> For details of targeting accuracy in three round designation, refer to Park et al, (2002) and Yue and Li (2004).

central government are distributed into nationally poor counties: subsidize loan, Food-for-Work and development funds. The three subprograms are administrated by different government agencies and have different function. Subsidized loans are administered by the Leading Group's Poor Area Development Office and Agricultural Development Bank and aims to provide loans to county and township run enterprises, as well as households; the Food-for-Work Project is organized by the State Planning Commission, with aim of providing funding for infrastructure construction such as roads, water reservation, land improvement and so on; Development funds is supported by the Ministry of Finance and provided under rather general purpose of development and income distribution. The subsidized loans is the biggest among the three subprograms in terms of scale of the poverty funds, which account for above half of total poverty funds provided by the central government in most years. Amount provided through Food-for-Works have been constantly larger than that by development funds, even though a little bit.

As to data availability of poverty funds, current statistics provides information on amount of poverty funds of each subprogram by the nationally poor county. This is most detailed information available on allocation of poverty funds. Little has been known about how the poverty funds are distributed below county level. Is the poor in nationally poor counties more likely to get access to poverty funds than the wealthy? Do the projects supported by poverty funds benefit more the poor than the non-poor? Such information is essential to accurate evaluation of impact of poverty alleviation program but lacking in current statistics, presenting main obstacle to assessment of program impact so far. However, the only exception is subsidized loans. From PMS information is available about which household receives the subsidized loans and how much they received during the period under survey. In the light of data availability, two types of data on poverty funds are used in the study to capture effectiveness of poverty alleviation program. The one is amount of poverty funds for each of three

subprograms by county for period of 1998 through 2001.<sup>16</sup> Per capita poverty funds for each subprogram are incorporated as explanatory variables in the following estimations. Statistical problem arising here is that these variables are endogenous because, as mentioned above, poverty funds are distributed with close relation to the poverty status that are dependent variables in the estimations made below. To deal with the concern, lag values of the poverty funds are used. ADBS (1997) provided information about amount of each of the three types of poverty funds by county for year of 1994 through 1996, and this data is used in estimation below.

The other type of poverty funds is subsidized loans directed to households. Inclusion of this type of funds into model estimation allows us to make assessment of whether the loan help households escape the poverty. The endogenous concern should not exist here because, as discussed above, the poor is not observed to have more opportunity to access the loan.

The econometrical method to estimate models is Least Absolute Deviation estimator for the censored data (LAD estimator) proposed by Powell (1984).<sup>17</sup> This model is motivated by non-robustness of traditional Tobit estimator in presence of heteroscedasticity or non-normality in the errors. The LDA estimator by Powell (1984) is method of repeated application of quantile regression on the observations with positive predicted values (the first regression is run on all the observation). The practical problem that often occurs when this estimation method is applied to poverty is, as discussed in Jalan and Ravallion (2000), that the repeated estimations stop when the selected observations are not enough. The shortage of observation arise when dependent variable of poverty index are heavily censored, which means most of households have zero poverty (unobserved data in Tobit model), usually due to application of lower poverty line. This is the case when Chinese official poverty line,

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<sup>16</sup> As mentioned before, the PMS from which the data used in the paper had been conducted from 1997 to 2001. The data on poverty funds for the first year is not collected properly, thus leaving the data only available for other four years.

<sup>17</sup> Deaton (1997) (pp. 405-6) provides a Stata's procedure to implement the censored LAD estimation, which is used in this study.

625 per capita per annum in 2000 price, is applied. The possible ways of dealing with the problem are to apply higher poverty line or/and to estimate the mode at higher quantile. Taking this into account, we estimate the models with data generated by poverty line of 874 Yuan and at 75<sup>th</sup> quantile.

Table 6 gives parameter estimates for both chronic and transient poverty. The estimations have been made for each of the two types poverty measured by income and consumption indicator separately, aiming to check whether the factors considered have similar impacts on the poverty, measured by income and consumption respectively.

Table 6 inserted here.

From the Table 6, it can be seen clearly that the age of the heads of households matter much more to the poverty measured by consumption than that by income, judged by the absolute values of estimates and their signs. Both chronic and transient poverty become less severe with ages of the heads of households because the households keep accumulating monetary assets and non-monetary experiences with age, which are important to prevent the consumption from going up and down with income fluctuation.

The number of family members has positive and statistically significant sign for each of the four estimations. This result confirms common belief that large family member is one of most important causes of poverty in rural China. The estimates of the number of labour as a proportion of total family members are a little bit surprising. This variable has negative and significant signs for both chronic and transient poverty in terms of income measure, but has opposite signs for poverty measured by consumption, even though insignificant in chronic estimation. This implies the number of labour as a ratio to family size may help reduce poverty in terms of income,

but never help to alleviate the poverty defined in the consumption term, even increase them.

With very few exceptions, education help reduce poverty, regardless of which type of poverty is concerned and no matter either income or consumption is used as welfare indicator. It is also clear from comparison of its estimates in different estimations that education also matters much more to poverty defined by consumption measure than that by income measure. Moreover, it has stronger impact on chronic poverty than on transient poverty. Despite of its strongest and constant effect on alleviation of poverty, the education received little attention in current poverty alleviation program. Poverty funds devoted to education and health care combined together account for only 4.1 percent of total poverty funds used in 1998, 3.4 percent in 1999 and 3.5 percent in 2000.

Physical stock and composition of total income of households give impacts on poverty as expected. Again, their impacts are greater for poverty measured in consumption than that in income. Estimated coefficients of cultivated lands per capita are negative for both chronic and transient poverty measured by consumption, and also for chronic poverty measured by income, but positive for transient poverty defined by income. This confirmed our prediction that cultivated land only provides security of basic needs for rural households. Two of three variables that are incorporated as measures of smoothing consumption: grains borrowed and change in cash holding and savings, have expected signs. The remittance from migrant family members has the expected sign, but far from significant, suggesting that it is an uncertain source of income for the rural households.

Three of four community variables, dummy for enterprise, net income per capita of county and its growth rate, have expected sign of, and highly significant estimates. This suggests that the poverty status of households largely depend on income level of communities where they live. Estimates of dummy for mountain area are not easily explained.



Moving on to estimation results for poverty policy variables, if the poverty funds really help to reduce the poverty the estimated coefficients should be negative and statistically significant. This, however, only happens to development fund in transient poverty estimation with poverty measured by income. In most cases, the poverty funds have no clear relation with both chronic poverty and transient poverty, even have positive and significant estimates. Such estimates are not what we expected for poverty reduction funds in the poverty estimations. However, how should the results be explained? First of all, the positive sign of estimates should not be interpreted as the poverty funds causing poverty but interpreted that the poverty program benefits more the wealthy than the poor in designated poor counties, a belief that most people have. Main reasons for poverty program less benefiting the poor should be the poor targeting of the poverty programs.

The poor targeting of poverty funds is first observed at county level. In investigating the determinants of allocation of poverty funds among nationally poor counties, Park et al. (2002) found only the development funds are negatively related to income level of counties for period from 1994 to 1996. For the period of 1988 though 2001, Yue and Li (2004) found that, taking whole designated poor counties together there is strongly negative link between per capita funds obtained and net income per capita for total poverty funds and each of its three components. The negative link, however, doesn't carry over into each province. In most provinces, there is no negative relation between per capita funds obtained and net income per capita among the designated poor counties, even positive relation is observed in a few provinces. This means that in most provinces, the poverty funds are distributed without consideration of income level of the counties.

The poor targeting of poverty funds is more serious below the county level. Did the poverty funds really reach the poor? Or have the most the funds leaked to the non-poor. As already mentioned above, PMS provides information on whether and amount the sample households receive the subsidized loans, which can used to answer

the question for subsidized loans. There are 1,059 households, 2.1 percent of total sample households, are reported to get the subsidized loans in 2000. Of which 424 households are the poor, accounting for 40.0 percent of total households reported to get the loan. The poor here is identified by World Bank's poverty line of 874 Yuan and income as welfare measure. This figure reduces to 190 households if official poverty line of 625 Yuan is applied. This only accounts for 17.9 percent of total households that have chance to access the subsidized loans. Therefore it is evident that poor households have no more, rather less, opportunity to get the subsidized loans than the wealthy. Refined analysis makes the evidence clearer. By estimating Tobit model, Yue and Li (2004) found that whether and amount the households got the loan do not respond to income level of households. The result is obtained by including income per capita of counties where the households locate, for which the estimate is negative. This suggests that, the households residing in lower income counties are more likely to access the subsidized loans than households locating in relatively higher income counties, however within a county the poor households have no more chance to get the loan than the wealthy do. This less opportunity for poor households to access the loan is attributable to several factors.<sup>18</sup> One of them is that the subsidized loans still require repayment and it is always higher repayment risk for the bank to provide a loan to the poor than to the wealthy.<sup>19</sup>

Clear evidence of poor targeting at poor households is given above for subsidized loans, the biggest one of three poverty reduction programs, in terms of amount of poverty funds. There are also some scattered evidences of poor targeting of other two poverty reduction program at the households level in a lot of works on Chinese rural poverty, such as Zhu and Jiang (1996) and World Bank (2001).

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<sup>18</sup> Refer to World Bank (2001) p. 48 for more detailed discussion.

<sup>19</sup> It is worth noting that not all the subsidized loans are directed to households. Part of the subsidized loans is lent to township and village enterprises (TVE). Proportion of loans directed to households is a bit more than half for each year of 1998 through 2001, based on PMS. This is the period that central government decided to shift the loans from TVE to households. During 1989 through 1997, the subsidized loans have mainly been concentrated on TVE and the poverty reduction impact of TVE with support by low interest subsidized loans has proven to be minimal. See World Bank (2001) pp. 46-7 for detailed discussion.

## 6. Discussions and conclusion

The study focuses on two components of total poverty: chronic and transient poverty and made an investigation of their relative importance in total observed poverty, as well as the determinants of each component. We found that the transient poverty account for large proportion of total poverty observed in the poor rural area of China. By analyzing the determinants of two types of poverty, we found demographic characteristics of households, such as age of the head of households, family sizes, the labor's proportion in the number of family numbers, and educational level of the head of the households are very important to the poverty status of households. These factors matter more to chronic poverty than transient poverty, and have greater impacts on the poverty measured by consumption than that measured by income. Besides the demographic factors of households, other households' factors, like physical stocks, the income composition and the amount of cultivated lands, also have significant effects on poverty. It is also confirmed that change in cash holding and saving and borrowing grain are used by rural households to smooth their consumption. Attributes of community where the households reside are important to poverty.

With very few exceptions, we did not find that poverty alleviation programs have significant impact on poverty reduction at the household level. We interpreted this as the poverty program benefiting more the wealthy than the poor in the poor area. Poor targeting of poverty program could be main factor responsible for this.

## References

- ADBC (Agricultural Development Bank of China), 1997. Statistical Yearbook 1997, Beijing, China Statistical Press.
- Arabmazar, A., Schmidt, P., 1981. Further evidence on the robustness of the Tobit estimator to heteroskedasticity. *Journal of Econometrics* 17,253-58.
- Arabmazar, A., Schmidt, P., 1982. An investigation of the robustness of the Tobit estimator to non-normality. *Econometrica* 50, 1055-63.
- Bane J., Ellwood, D., 1986. Slipping into and out of poverty: The dynamics of spells. *Journal of Human Resources* 21(1), 1-23.
- Chen, S., Ravallion, M., 2003. Hidden impact? Ex-post evaluation of an anti-poverty program. Mimeo.
- Deaton, A., 1997. The Analysis of household surveys, published for World Bank. The Johns Hopkins University Press.
- Foster, J., E. Greer, J., Thorbecke, E., 1984. A Class of decomposable poverty measures. *Econometrica* 52, 761-766.
- Jalan, J., and Ravallion, M., 1998a. Are there dynamic gains from a poor-area development program. *Journal of Public Economics* 67, 338-57.
- Jalan, J., and Ravallion, M., 1998b. Transient poverty in postreform rural china. *Journal of Comparative Economics* 26(2), 338-57.
- Jalan, J., and Ravallion, M., 2000. Is transient poverty different? Evidence for rural China. *Journal of Development Studies* 36(6), 82-99.
- Park, A., Wang, S., Wu, G., 2002. Regional poverty targeting in China. *Journal of Public Economics* 86(1), 123-53.
- Powell, L., 1984. Least absolute deviations estimation for Tobit model. *Journal of Econometrics* 25, 303-25.
- Riskin R., 1994. Chinese rural poverty: marginalized or dispersed?. *American Economic Review* 84 (2), 281-284.
- Rodgers, R., Rodgers, L., 1993. Chronic poverty in the United States. *The Journal of*

Human Resources 28(1), 25-54.

Zhang, L., Huang, J., Rozelle, S., 2003. China's war on poverty: Assessing targeting and the growth impacts of poverty program. *Journal of Chinese Economic and Business Studies* 1(3), 301-317.

Zhu, L., Jiang, J., 1996. *Public works and poverty alleviation in rural China*. Nova Science Publishers.

Yue, X, Li, S., 2004. Targeting accuracy of poverty-reducing programs in rural China. *China & World Economy* 12(2), 101-116.

World Bank, 2001. *China: Overcoming rural poverty*. The World Bank, Washington, D.C.

Appendix Table: Explanatory variables, way of creating, and their expected signs

| Name of variables   | Expected sign | Way of creating variables and explanation   |
|---|---------------|---|
| Age   | +             | Age and age <sup>2</sup> is incorporated to capture the life-cycle effect.  |
| Age <sup>2</sup>  | -             | The sign of age is expected positive and age <sup>2</sup> negative.   |
| Family size   | -             | Number represents the number of household. Its estimates should be negative as there is negative correlation between the size of family and income per capita. Furthermore, the size of family has been considered as a cause of poverty.   |
| Labor as proportion of family size                                | -             | Defined as ratio of the number of labor to the size of family. Lacking of labor has been considered main factor in causing poverty, chronic poverty in particular. If this is true, sign of the variable should be negative. That is, a family with more labors should be easy to escape the poverty.   |
| Dummy of primary school   | -             | Educational dummy for those heads of households who graduated from primary school. Five educational categories are used in this study: illiteracy and semi-illiteracy, primary school, middle school, high school, and college and above. The left out educational level is illiteracy and semi-illiteracy, the lowest attainment in five educational groups. Therefore, expected sign of estimate for Edummy2 is positive. |
| Dummy of middle school  | -             | Educational dummy for middle school.  |
| Dummy of high school  | -             | Educational dummy for high school.  |
| Dummy of college and above  | -             | Educational dummy for college and above.  |
| Proportion of income from household operation in the total income | +             | Defined as share of income from households operation to total income. Because income from households operation is source of lower income, the estimates should be positive.   |
| Physical stock per capita   | -             | Time mean of physical capital per capita. Its sign is expected negative.  |
| Cultivated land per capita  | ?             | Cultivated land per capita of households.   |
| Time mean of grain borrowed per capita                            | -             | Standard deviation of grain borrowed over time. It would have function of smoothing consumption. Therefore the sign of its estimate should be negative.   |
| Time mean of change in cash holding and savings                   | -             | Defined as absolute value of difference of amount of cash and savings that households hold in the end and the beginning of year. It is time mean too. Variation of the cash holding and savings can be used as a consumption-smoothing instrument. Its sign should be negative, especially in regression of transitory poverty.   |
| Variation of remittance income over time                          | -             | Logarithmic value of time mean of remittance from family members who migrate into and work in the city. Its expected sign of estimates is negative.   |
| Enterprise dummy  | -             | Dummy for enterprise in the villages where the households reside. It is 1 if there is an enterprise in the village, and 0 otherwise. Its sign is expected negative.   |

|   |   |   |
|---|---|---|
| Mountainous dummy   | + | Dummy for mountain area. It is 1 if the village where the households reside is mountain area, and 0 otherwise. Its sign should be positive.   |
| Per capita net income of counties in 1997                             | - | Net income per capita of counties. Expected sign of the estimated is minus.   |
| Annual growth rate of per capita income of counties from 1997 to 2001 | - | Annual growth rate of net income per capita of counties from 1997 to 2001. the estimates should be negative.  |
| Time mean of subsidized loans at households level                     | - | Time mean of amount of the subsidized loans that households obtained. The subsidized loans aim to alleviate the poverty. Its sign should be negative if it has significant impact on poverty. |
| Time mean of per capita subsidized loans of counties                  | - | Time mean of subsidized loans per capita of nationally designated counties invested from 1994 to 1996.  |
| Time mean of per capita development funds of counties                 | - | Time mean of development funds per capita of nationally designated counties invested from 1994 to 1996.   |
| Time mean of per capita Food-for work funds of counties               | - | Time mean of food-for-work per capita of nationally designated counties invested from 1994 to 1996.   |

Table 1: Aggregate poverty and its chronic and transitory components

| Indicators of well-being and poverty lines | Aggregate poverty index | Chronic poverty | Transitory poverty | Share of transitory poverty (%) |
|--|-------------------------|-----------------|--------------------|---------------------------------|
| Consumption, per capita per annum          |                         |                 |                    |                                 |
| 625 Yuan                                   | 0.0199                  | 0.0073          | 0.0126             | 63.40                           |
| 874 Yuan                                   | 0.0568                  | 0.0328          | 0.0240             | 42.27                           |
| Income, per capita per annum               |                         |                 |                    |                                 |
| 625 Yuan                                   | 0.0660                  | 0.0057          | 0.0603             | 91.34                           |
| 874 Yuan                                   | 0.0697                  | 0.0161          | 0.0535             | 76.86                           |

Notes: the 625 Yuan per capita per annum is Chinese official poverty line, and 874 Yuan per capita per annum is World Bank's poverty line (\$1/per day).

Source: authors' calculation.

Table 2: Aggregate poverty index and its components by age of the head of household

| Age of the head of household in 2000                            | Aggregate poverty index | Chronic poverty | Transitory poverty | Share of transitory poverty (%) |
|---|-------------------------|-----------------|--------------------|---------------------------------|
| Poverty indexes   |                         |                 |                    |                                 |
| 16-25   | 0.0666                  | 0.0380          | 0.0286             | 42.9                            |
| 26-30   | 0.0625                  | 0.0385          | 0.0240             | 38.3                            |
| 31-35   | 0.0560                  | 0.0325          | 0.0235             | 41.9                            |
| 36-40   | 0.0513                  | 0.0312          | 0.0200             | 39.1                            |
| 41-45   | 0.0529                  | 0.0302          | 0.0226             | 42.8                            |
| 46-50   | 0.0544                  | 0.0309          | 0.0236             | 43.3                            |
| 51-55   | 0.0569                  | 0.0315          | 0.0254             | 44.6                            |
| 56-60   | 0.0668                  | 0.0380          | 0.0288             | 43.1                            |
| 60-   | 0.0697                  | 0.0393          | 0.0305             | 43.7                            |
| The contribution of each age group to total poverty indexes (%) |                         |                 |                    |                                 |
| 16-25   | 0.6                     | 0.6             | 0.6                |                                 |
| 26-30   | 5.1                     | 5.5             | 4.6                |                                 |
| 31-35   | 11.6                    | 11.7            | 11.5               |                                 |
| 36-40   | 15.1                    | 15.9            | 13.9               |                                 |
| 41-45   | 17.4                    | 17.3            | 17.6               |                                 |
| 46-50   | 18.1                    | 17.8            | 18.5               |                                 |
| 51-55   | 13.0                    | 12.5            | 13.7               |                                 |
| 56-60   | 9.2                     | 9.1             | 9.4                |                                 |
| 60-   | 9.8                     | 9.6             | 10.1               |                                 |
| Aggregate   | 100.0                   | 100.0           | 100.0              |                                 |

Source: Author's calculation.



Table 3: Aggregate poverty index and its components by education of the head of household

| The educational attainment of the head of household         | Aggregate poverty index | Chronic poverty | Transitory poverty | Share of transitory poverty (%) |
|---|-------------------------|-----------------|--------------------|---------------------------------|
| Poverty indexes   |                         |                 |                    |                                 |
| Illiteracy and semi-illiteracy                              | 0.0939                  | 0.0625          | 0.0314             | 33.4                            |
| Primary school  | 0.0599                  | 0.0342          | 0.0257             | 42.9                            |
| Middle school   | 0.0481                  | 0.0264          | 0.0217             | 45.1                            |
| Higher school   | 0.0403                  | 0.0210          | 0.0194             | 48.0                            |
| College and above   | 0.0333                  | 0.0171          | 0.0162             | 48.6                            |
| The contribution of each group to total poverty indexes (%) |                         |                 |                    |                                 |
| Illiteracy and semi-illiteracy                              | 16.3                    | 18.8            | 12.8               |                                 |
| Primary school  | 43.9                    | 43.6            | 44.3               |                                 |
| Middle school   | 31.2                    | 29.8            | 33.1               |                                 |
| Higher school   | 8.6                     | 7.8             | 9.7                |                                 |
| College and above   | 0.1                     | 0.1             | 0.1                |                                 |
| Aggregate   | 100.0                   | 100.0           | 100.0              |                                 |

Source: Author's calculation.

Table 4: Aggregate poverty index and its components by size of the household

| The number of household                                     | Aggregate poverty index | Chronic poverty | Transitory poverty | Share of transitory poverty (%) |
|---|-------------------------|-----------------|--------------------|---------------------------------|
| Poverty indexes   |                         |                 |                    |                                 |
| 1   | 0.0295                  | 0.0071          | 0.0224             | 75.9                            |
| 2   | 0.0340                  | 0.0142          | 0.0199             | 58.4                            |
| 3   | 0.0343                  | 0.0150          | 0.0193             | 56.4                            |
| 4   | 0.0425                  | 0.0210          | 0.0214             | 50.5                            |
| 5   | 0.0591                  | 0.0345          | 0.0246             | 41.6                            |
| 6   | 0.0779                  | 0.0484          | 0.0295             | 37.9                            |
| 7   | 0.0925                  | 0.0657          | 0.0268             | 29.0                            |
| 8   | 0.1035                  | 0.0698          | 0.0336             | 32.5                            |
| The contribution of each group to total poverty indexes (%) |                         |                 |                    |                                 |
| 1   | 0.1                     | 0.0             | 0.1                |                                 |
| 2   | 1.8                     | 1.3             | 2.4                |                                 |
| 3   | 7.4                     | 5.6             | 9.8                |                                 |
| 4   | 23.9                    | 20.5            | 28.5               |                                 |
| 5   | 28.5                    | 28.9            | 28.0               |                                 |
| 6   | 20.0                    | 21.5            | 17.9               |                                 |
| 7   | 10.7                    | 13.2            | 7.3                |                                 |
| 8   | 7.7                     | 9.0             | 5.9                |                                 |
| Aggregate   | 100.0                   | 100.0           | 100.0              |                                 |

Source: Author's calculation.

Table 5: Aggregate poverty index and its components by region

| Region  | Aggregate poverty index | Chronic poverty | Transitory poverty | Share of transitory poverty (%) |
|---|-------------------------|-----------------|--------------------|---------------------------------|
| <b>Poverty indexes</b>  |                         |                 |                    |                                 |
| The Eastern   | 0.0221                  | 0.0078          | 0.0142             | 64.6                            |
| The Middle  | 0.0560                  | 0.0325          | 0.0235             | 42.0                            |
| The Western   | 0.0614                  | 0.0358          | 0.0256             | 41.7                            |
| <b>The contribution of each region to total poverty indexes (%)</b> |                         |                 |                    |                                 |
| The Eastern   | 2.3                     | 1.4             | 3.6                |                                 |
| The Middle  | 42.0                    | 42.3            | 41.6               |                                 |
| The Western   | 55.7                    | 56.3            | 54.8               |                                 |
| Aggregate   | 100.0                   | 100.0           | 100.0              |                                 |

Source: Author's calculation.

Table 6: Parameter estimates of the determinants chronic and transient poverty for period of 1997 through 2002

| Welfare measure   | Consumption           |                       | Income                |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
|   | Chronic               | Transient             | Chronic               | Transient             |
| Explanatory variables   |                       |                       |                       |                       |
| Age of head of households   | -0.00487<br>(7.23)**  | -0.00197<br>(9.03)**  | -0.00070<br>(0.97)    | -0.00090<br>(2.52)*   |
| Age squared   | 0.00004<br>(6.52)**   | 0.00002<br>(9.37)**   | 0.00000<br>(0.31)     | 0.00001<br>(2.99)**   |
| Family size   | 0.03144<br>(36.38)**  | 0.00612<br>(24.10)**  | 0.01686<br>(20.21)**  | 0.00396<br>(9.70)**   |
| Labor as proportion of family size                                    | -0.00474<br>(0.86)    | 0.01153<br>(6.99)**   | -0.05007<br>(8.12)**  | -0.02223<br>(8.21)**  |
| Dummy of primary school   | -0.01308<br>(3.95)**  | -0.00303<br>(2.69)**  | -0.01229<br>(3.87)**  | 0.00059<br>(0.33)     |
| Dummy of middle school  | -0.03640<br>(9.70)**  | -0.00808<br>(6.71)**  | -0.01879<br>(5.27)**  | -0.00247<br>(1.28)    |
| Dummy of high school  | -0.06347<br>(12.97)** | -0.01181<br>(8.21)**  | -0.02797<br>(5.87)**  | -0.00629<br>(2.69)**  |
| Dummy of college and above  | -0.09162<br>(2.64)**  | -0.02566<br>(2.56)*   | -0.04686<br>(2.56)*   | -0.01816<br>(1.03)    |
| Physical stock per capita   | -0.00867<br>(16.42)** | -0.00238<br>(13.29)** | -0.00758<br>(12.65)** | -0.00172<br>(5.95)**  |
| Proportion of income from household operation in the total income     | 0.00100<br>(15.35)**  | 0.00012<br>(6.27)**   | 0.00101<br>(12.80)**  | 0.00046<br>(13.93)**  |
| Cultivated land per capita  | -0.04249<br>(17.45)** | -0.00310<br>(4.07)**  | -0.01048<br>(4.19)**  | 0.01411<br>(11.22)**  |
| Time mean of change in cash holding and savings                       | -0.00003<br>(12.52)** | -0.00000<br>(2.77)**  | -0.00007<br>(13.20)** | -0.00000<br>(2.47)*   |
| Time mean of grain borrowed per capita                                | -0.01444<br>(27.65)** | -0.00118<br>(8.55)**  | 0.00098<br>(1.77)     | 0.00155<br>(6.69)**   |
| Variation of remittance income over time                              | -0.00111<br>(0.75)    | -0.00042<br>(0.98)    | 0.00228<br>(1.51)     | 0.00054<br>(0.75)     |
| Enterprise dummy  | -0.02224<br>(8.02)**  | -0.00248<br>(3.46)**  | -0.01681<br>(5.26)**  | -0.00305<br>(2.43)*   |
| Mountainous dummy   | -0.00036<br>(0.14)    | 0.00033<br>(0.45)     | -0.02465<br>(7.96)**  | -0.00037<br>(0.29)    |
| Per capita net income of counties in 1997                             | -0.00012<br>(22.90)** | -0.00001<br>(9.63)**  | -0.00035<br>(29.15)** | -0.00012<br>(40.40)** |
| Annual growth rate of per capita income of counties from 1997 to 2001 | -0.00084<br>(4.67)**  | -0.00047<br>(7.94)**  | -0.00555<br>(22.20)** | -0.00237<br>(22.38)** |
| Time mean of subsidized loan at households level                      | -0.00014<br>(0.15)    | 0.00044<br>(1.56)     | 0.00146<br>(1.69)     | 0.00117<br>(2.65)**   |
| Time mean of per capita subsidized loan of counties                   | 0.01905<br>(9.68)**   | 0.00047<br>(0.81)     | -0.00271<br>(1.04)    | -0.00176<br>(1.79)    |
| Time mean of per capita Food-for work funds of counties               | 0.01644<br>(10.97)**  | -0.00062<br>(1.33)    | 0.01186<br>(6.35)**   | 0.00539<br>(6.70)**   |
| Time mean of per capita development funds of counties                 | -0.00215<br>(1.96)*   | -0.00002<br>(0.07)    | 0.00209<br>(1.75)     | -0.00262<br>(4.66)**  |

|              |                      |                      |                      |                      |
|--------------|----------------------|----------------------|----------------------|----------------------|
| Constant     | 0.24926<br>(12.16)** | 0.09649<br>(15.73)** | 0.41365<br>(14.70)** | 0.19562<br>(18.44)** |
| Pseudo R2    | 0.1749               | 0.1022               | 0.0993               | 0.1000               |
| Observations | 6953                 | 15468                | 3186                 | 12542                |

Absolute value of t statistics in parentheses

\* significant at 5%; \*\* significant at 1%

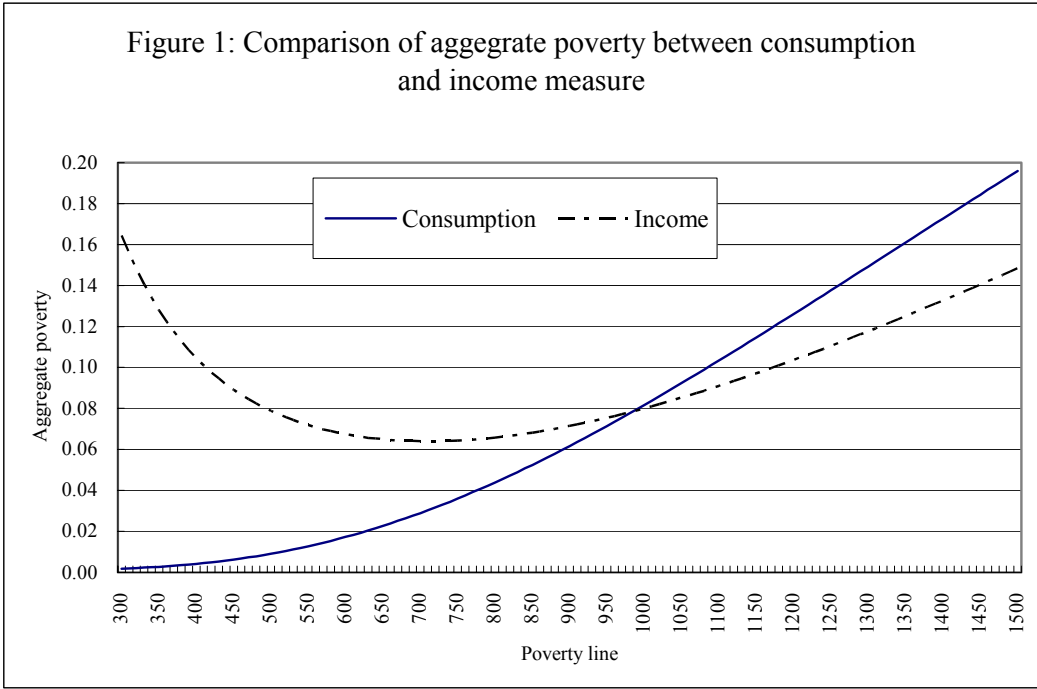


Figure 2: Comparison of chronic poverty between consumption and income measure

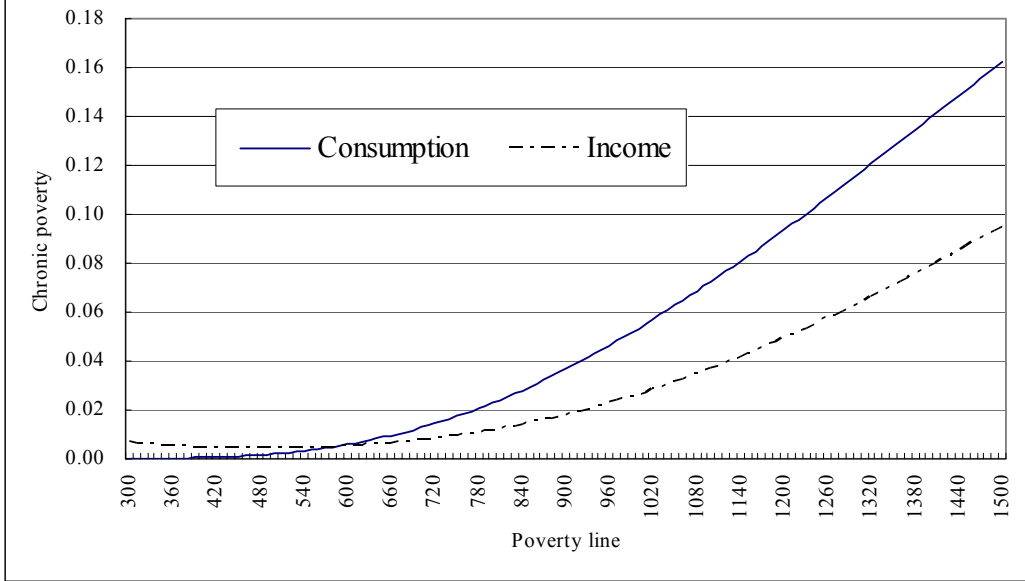


Figure 3: Comparison of transitory poverty between consumption and income measure

