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Marriage Squeeze and Intergenerational Support in Contemporary Rural China: Evidence from X County of Anhui Province

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Abstract

With China's gender imbalance and increasingly severe male marriage squeeze, patterns of intergenerational support in rural areas are likely to undergo significant change. Using data from a survey of four towns from X county in Anhui province carried out in 2008, this paper analyzes the effects of sons' marital status on intergenerational support. Random-effect regression analysis shows that son's marital status has strong effects on financial support to and co-residence with parents. Compared with married sons, older unmarried sons (so-called forced bachelors) tend to provide less financial support to their parents, and are more likely to live with their parents. Parents' support of sons, as well as the parents' own needs and sons' capabilities all affect the support provided by sons. These results show that both theories of exchange and altruism are simultaneously relevant in the context of the marriage squeeze of contemporary rural China.

Keywords

forced bachelors; financial support; instrumental support; emotional support; co-residence

Introduction

Son preference, discrimination against girls, sex-selective abortion and strict fertility policies have led to gender imbalance and a strong marriage squeeze on males in China (Coale & Banister, 1994; Li, Jiang, & Feldman, 2006; Poston & Glover 2004). Li et al. (2006) estimate that the fraction of "surplus" men (i.e. the number of men of marriageable age in excess of the number of women of marriageable age as a result of a high sex ratio at birth) among China's male population will be more than 10 per cent after 2013, and each year

about 1.2 million men, on average, will fail to find a never-married partner for their first marriage. These older never-married men in rural China are called “forced bachelors”; they are usually 28 years old and older (Liu et al., 2014; Zhang & Zhong, 2005), usually from poor families, they have limited ability to earn money, they may be handicapped or in poor health or they live in areas where there is a shortage of females of marriageable age (Mo, 2005; Ye & Lin, 1998). In fact, there would still be some surplus males even if the sex ratio at birth (abbreviated as ‘SRB’ in the following) were normal (103–107) for the following two socioeconomic reasons. First, bride-price, the compensation for the bride to join her husband’s family, is increasing dramatically and has reached unaffordable levels for some poor families in rural areas of China (Min & Eades, 2008); this may be a result of the scarcity of girls. Second, female migration for employment and marriage is increasing in China (Davin, 1999; Fan & Huang, 1998; Meng, 2009), which decreases the marriage rate and exacerbates the marriage squeeze in rural China.

The imbalance in the SRB can therefore be expected to put a huge strain on the Chinese traditional son-based family old-age support system. In most of rural China, the patrilineal family system is dominant (Cohen, 1990; Fei, 2006); this features “single-lineage emphasis” that gives sons (and their wives) a very important role in the old-age support of parents (Mason, 1992; Pei & Pillai, 1999). In rural China, elderly parents expect more from sons than from daughters (Sun, 2002), because daughters’ filial obligations to support parents are traditionally transferred to their husbands’ parents (Whyte, 2004). As a reliable public old-age security system has not yet reached the rural areas, in particular the poor ones, reliance on children is still the primary old-age support system in rural China. Sons, and especially daughters-in-law, are usually the major sources of old-age support for parents (Chen & Silverstein, 2000; Lin et al., 2003). Although unmarried sons may be able to still provide many kinds of support for their parents, it is not clear how much support they actually provide. Even if they provide other kinds of support, they do not have a wife who can provide the kind of support generally expected from a daughter-in-law. Moreover, according to Cong and Silverstein (2008), absence of a daughter-in-law usually disappoints and distresses the elders since assistance, especially personal care from a daughter-in-law, significantly reduces elders’ depressive symptoms in rural China. Accordingly, sons’ marital status is expected to be an important factor influencing intergenerational support as well as parents’ well-being.

Because of a son’s expected function in their parents’ old age, helping son(s) to get married has always been regarded as the responsibility of parents. Perhaps a saying in rural areas describes the phenomenon accurately: “parents owe a son a wife, the son owes his parents a coffin”. If a son’s marriage is accomplished smoothly, the son must support his parents when they become old. On the other hand, if parents are unable to arrange a marriage by providing bride price, betrothal gifts and marriage ceremony expenses and so on for a son, it could justify the son not supporting them (Cohen, 1998). It can be inferred that sons’ marital status has effects on intergenerational support, including financial support, instrumental support, emotional support and co-residence. According to the exchange theory (Frankenberg et al., 2002; Cong & Silverstein, 2011), compared with married sons, old unmarried sons are likely to provide their parents with less financial support since their parents did not invest enough in their education and marriage. Due to the traditional gender norm that daughters-in-law are

the care-givers in rural China, and take on the responsibility of instrumental support (Cohen, 1998; Cong & Silverstein, 2008), parents co-residing with old unmarried sons may receive less instrumental support from the latter. A few studies reveal that emotional support between old unmarried sons and parents is weak because the former tend to blame their failure to get married on the latter (Mo, 2005). In rural families, parents usually live with one of their married sons if all the sons are married (Weinstein et al., 1990; Lee et al., 1994). In compliance with the norm of “remaining in co-residence with parents until getting married”, the traditional living arrangement for parents tends to change by extending the co-residence duration between unmarried sons and parents, which is likely to influence other types of intergenerational support.

How son’s marital status, especially forced bachelorhood, affects the intergenerational support between parents and sons in rural China is the focus of this paper. Previous studies of the family-based old-age support system have paid little attention to the effects of sons’ failure to marry on the family’s function in providing old-age support. Most studies of intergenerational support have focused on the effect of the parents’ marital status on their own access to old-age support in China or in Taiwan (e.g., Lee & Xiao, 1998; Hermlin, Ofstedal, & Chang, 1996; Logan & Bian, 2003). Fewer studies have focused on the effect of son’s marital status on their support of their parents.

In this paper quantitative data from a sampling survey will be used to analyze the effect of sons’ marital status on intergenerational support between parents and sons. We will assess the impact of men’s failure to get married on family function in providing old-age support. From the perspective of parents, sons may provide four types of resource support, namely financial support, instrumental support, emotional support and co-residence. Here we explore the hypotheses of altruism and exchange between parents and their sons who differ in marital status. We ask whether the motives underlying intergenerational support between forced bachelors and their parents are different from those of married sons, and if they differ whether the son’s marital status is an important determinant of the difference. Clarifying the effect of sons’ marital status on intergenerational support is important in contemplating reform of the Chinese social security system. Understanding current intergenerational support provided by forced bachelors to their parents, and how parents have responded to this support, will also help to assess the impact of the marriage squeeze on old-age support.

Theories and Hypotheses

Theoretical context about support motives

Exchange and altruism are widely cited as intergenerational support motives in the literature on Chinese families, and many studies have supported the altruism motive behind household support in Chinese families (Shi, 1993; Lee, Parish, & Willis, 1994; Lee & Xiao, 1998). Altruism entails that family members will provide sufficient resources to maximize all family members’ well-being (Becker, 1974). Altruistic support behavior is for family solidarity rather than individual interests. In this case, children will care about their parents’ well-being and may transfer part of their income to parents when parents’ ability to earn declines (Becker, 1974; Bernheim, Shleifer, & Summers, 1985; Cox, Eser, & Jimenez, 1998). Some previous studies have strongly supported altruism as a motivation for Chinese

families, and have found that the intergenerational support tends to be directed toward those who are most in need of assistance (usually older, poor, alone or unhealthy people) (Sun, 2002; Lee et al., 1994; Lee & Xiao, 1998). However, altruism alone is not sufficient to explain intergenerational support between parents and children, especially since the exchange of “time-for-money” is very common with the extensive outflow of rural middle-aged labor in China (Frankenberg, Lillard, & Willis, 2002; Cong & Silverstein, 2011).

Different from the altruism motive, exchange theory emphasizes reciprocity among family members of different generations, where repayment can occur immediately or in the distant future. Exchange includes two forms; one form of exchange behavior occurs immediately or in the short term, and involves grandchild care, housework assistance, financial support and so on (Frankenberg et al., 2002; Cong & Silverstein, 2011). The other form is associated with long-term “prospective exchange”, involving parents investment in children’s education, health, marriage and employment and so on (Davis, 1993; Riley, 1994; Lee & Xiao, 1998; Frankenberg et al., 2002). For short-term exchange several empirical studies on Chinese families confirm that there is a strong positive relationship between parents’ services and children’s financial support. Adult children provide money or food to their parents as repayment for parents’ housing assistance, child care or other services (Frankenberg et al., 2002; Lee & Xiao, 1998; Cong & Silverstein, 2011). In the long-term exchange, to repay parents’ investment in their education or marriage expenses, children tend to provide all kind of support to parents (Chen, 2001; Li, Feldman, & Jin, 2004; Zhang, 2005); this is consistent with the theory of exchange. Exchange motivations, to some degree, suggest that parents providing support to children is motivated by their own old-age security considerations, and children giving support aims to make their own lives easier.

There has been much debate about whether the theory of exchange or altruism is more appropriate in the context, but there is still no consensus. In empirical research by Kohli and Künemund (2003) there was no obvious distinction between exchange and altruism. Some research suggests that neither exchange nor altruism alone can explain the observed support in China and both are involved at the same time (Secondi, 1997; Sun, 2002). In this case, parents would receive financial support by taking care of grandchildren, and the financial flow would then be mainly to disadvantaged parents; these two motives can exist simultaneously in rural Chinese households. The demand for resources within a Chinese family varies over time; early in the life course, the needs of children are greater than those of parents, but later the needs of ageing parents are likely to take priority (Chen, 2005). From this perspective, intergenerational support and resource allocation are more complicated than previously thought, and evidence on support motives is inconclusive. Further, these two classes of motives place too much emphasis on the donor’s and recipients’ socio-economic resources, especially their income, wealth or assets. The resources a person has are the key factors in distinguishing exchange from altruism. However, previous literature has overlooked important life events such as marriage, childbirth and illness, which may change the possibility of intergenerational support in households. In this paper, exchange theory and altruism theory, as well as a son’s marital status, will be discussed in relation to intergenerational support.

The role of children's marriage in intergenerational support

In China, marriage is a major event for both the husband's and the wife's natal families. In rural areas, there is a long-standing cultural expectation that parents help their son(s) to get married or face no support in old age and no worship after death (e.g., Gates, 1996; Wolf, 1974; Wolf & Huang, 1980). In a sense, the relationship between Chinese parents helping their son(s) get married and receiving support from their son(s) is in keeping with long-term exchange, which does not occur immediately but at a further time. Fear of a possible destitute future has driven rural parents to contribute substantially to their children's marriage, despite the financial strains incurred (Zhang, 2005; Davis, 1993). In contemporary Chinese rural society, much empirical research confirms that parents offer much financial support to help sons get married smoothly. This money provided by parents is mainly used for building a new house, bride price, wedding feast and so on (Zhang, 2000), which make a socially acceptable marriage for their sons; this is becoming a major form of intergenerational support from parents. Thus, the main family wealth in China is usually transferred from older to younger generations when children get married (Davis, 1993; Wang, 2010). Strong circumstantial evidence suggests that children's marriage forms will play an important role in determining intergenerational support. In addition, more direct evidence shows that children's marriage forms have a significant influence on their support behavior to parents. In China, old-age support is mainly based on the son in a virilocal marriage, while in an uxorilocal marriage, the daughter provides old-age support to her parents (Li *et al.* 2004; Zhang, 2005). A child's marital crisis could also lead to increased help from parents (Spitze & Logan, 1990).

Despite the rising numbers of older unmarried childless men, there has been little attention paid to intergenerational support between these so-called forced bachelors and their parents. Some qualitative studies on the contemporary period and quantitative studies on the late 19th and early 20th centuries have found that factors such as family poverty and having many sons often result in differentiation between sons in their family's contribution to financing a marriage (Wolf & Huang, 1980; Zhang & Zhong, 2005). With soaring marriage costs, which may make it difficult in families with more than one son to pay for all sons' marriages, the probability that all the sons in such families marry is relatively low (Chen, 2004). Compared with married sons, older unmarried sons have received less financial support from their parents to help them get married, which, in turn, may change the older unmarried men's support behavior to their parents.

In this paper, we explore the difference in intergenerational support between forced bachelor sons and married sons. We ask whether the son's marital status is an important determinant of such a difference.

Other factors explaining support

In addition to children's marital status, mutual intergenerational support, such as financial support, housework help, fieldwork help, and childcare help, between sons and parents, have been shown to have impacts on specific intergenerational support (Koh & Mac Donald, 2006; Cong & Silverstein, 2011). In addition, personal characteristics such as age, health,

socio-economic situations (education, occupation and income) also affect intergenerational exchange (Eggebeen & Hogan, 1990; Li *et al.* 2004; Shi, 1993; Lee & Xiao, 1998).

Hypotheses

This paper focuses on four types of current support (mainly in the past 12 months) to parents: financial support, instrumental support, emotional support, and co-residence, and we test hypotheses to explore whether altruism or exchange motivates those support. The results can help us understand the full range of assistance from sons in different marital circumstances to their rural parents. Based on the theories of social exchange and altruism, as well as the related empirical literature just described, the following hypotheses are proposed:

- Hypothesis 1** The probability of intergenerational support is higher for a married son than for an older unmarried son who has reached the age of 28 and is unlikely to marry; this is consistent with exchange theory.
- Hypothesis 2** The probability of providing intergenerational support is higher for a son who has received any kind of intergenerational help from his parents than a son who hasn't; this is consistent with exchange theory.
- Hypothesis 3** The probability of receiving intergenerational support is higher for parents who have lower socio-economic status, poor health or are widowed; this is consistent with altruism theory.

Data and Methods

Data

Our data are from a survey conducted by Institute for Population and Development Studies at Xi'an Jiaotong University in four towns in X county (a pseudonym) of Anhui province in August 2008. X county is located in the east of Anhui province and near Jiangsu province, and includes plain and mountains. The county is at a medium economic level, and the rural per capita net income was 4,383 Yuan in 2007, slightly higher than the national average of 4,140 Yuan. According to the data from the 2000 census, the sex ratio at birth is more than 130 in Anhui province and 145 in X county, where gender imbalance is serious and son preference remains strong (Graham, Larsen, & Xu, 1998). X county represents an average level for the male marriage squeeze and socioeconomic development for rural China. The four towns covered in the survey had a total population of 187,188, and the number of bachelors aged 28 and above totaled 1,757. Almost all of these are forced to be single; for example, the primary analysis of our data found that 96% of never-married men above 28 reported that they had experienced various difficulties in marrying, while the proportion of married men reporting difficulties marrying was only 37%. In sum, X county is a suitable site to examine the marriage squeeze and its consequences in rural China.

The objective of this survey was to comprehensively explore the potential effects of the male marriage squeeze on bachelors, families and communities. Subjects in the survey include younger unmarried men aged 27 and below, older unmarried men aged 28 or older, married men, unmarried women, married women, and their parents. All of the respondents had to be

rural residents of the surveyed villages. First, we used multiple-stage sampling to select respondents from three levels: town, village, and individual. Based on their geography and economic development, we selected four neighboring towns in X county. Two towns were on the plains and the other two were in the mountains. In every town, we selected nine or ten villages randomly, for a total of 38 villages. Second, in every administrative village (which includes multiple natural villages), we used disproportionate stratified random sampling to select the respondents from the sampling frames for never-married men aged 28 and above, and married men under 50, respectively. Since the older never-married men were much less frequent than married men, we oversampled the former and downsampled the latter in order to make the statistical analysis possible. Third, all natal parents (at least one parent is alive within a household) of the older never-married men and married men, as well as all parents-in-law (at least one parent-in-law is alive within a household) of the married women were interviewed. If both parents were alive, the healthier one was selected.

To ensure reliability, the data were collected through face-to-face interviews, and each investigator surveyed all of the respondents in the village to which he or she was assigned. Interviewers were village family planning staff who had high school education or above, and each was assigned a village with which he or she was familiar. Finally, 323 older never-married men (of whom 158 were under 50), 265 married men under 50, 160 married women, and 518 parents of the above respondents were selected. Because the survey was organized with the support of local government authorities, the response rate was close to 100%. Additionally, the research team trained investigators in advance of the survey, supervised investigators during the survey, reviewed questionnaires, and re-interviewed a 5% sample to ensure data quality. Preliminary analysis suggests that the quality of data is quite reliable, with a consistency rate above 90% between formal sample interviews and post-survey re-interviews, apart from some items concerning attitudes (these were about 80% consistent).

Our data come from questionnaires answered by a total of 518 parent respondents who had at least one child. In the following analysis, the parent sample will be restricted to the 421 respondent who had at least one son older than 28 years. There were a total of 834 sons older than 28 years and their marital status was either married and or older unmarried, and eleven missing responses that didn't include the intergenerational support between parents and their son were deleted. Finally 421 parents with 823 sons were involved in the analysis. We excluded men younger than 28 years, on the one hand to compare the married and older unmarried men, and on the other hand, unmarried men younger than 28 years are not "forced bachelors", and most are likely to get married in the future. The parent respondents provided basic information about themselves and all their children, such as their age, marital status, education and income, as well as intergenerational support between them and their adult children.

In this paper, only the sons' current marital status is used as an indicator of the parental help for a son to get married. Since the parents were not asked the amount of their financial support in helping sons get married, this may limit interpretation of our results. The survey was conducted in only one rural county, and results could be different in other rural areas

where the level of economic development and extent of out-migration may be different and possibly important; these issues are left to a future study.

Methods

Our analysis proceeds in two steps: First, we describe in general terms the intergenerational support between parents and sons according to marital status. At this step, we use a *t* test for continuous variables, and LR (likelihood ratio) test for categorical variables. Second, random-effects regression modeling is used to analyze the determinants of support: because most respondents have multiple sons, sons who come from the same family share some same characteristics, especially their parent's information, which means that family heterogeneity must be controlled. By introducing a random component to eliminate the clustering effect, a hierarchical model can control for family heterogeneity (Goldstein, 1987). The random effects binary logistic was used to analyze whether parents have received financial support, instrumental support, or co-residence support from a son, and random effects OLS regression was used to analyze emotional support from a son.

Variables

Dependent variables—The probability that parents have received any of the following four forms of support in the past 12 months: financial support, instrumental support, emotional support, and co-residence. (1) Financial support. In the survey, the parent respondents were asked “Had this child has given you (or your spouse) money, food or gifts during the past 12 months?” We scored the answer “no” as zero and “yes” as one, with the former used as the reference. (2) Instrumental support. There were two dichotomous variables for support received from a son in the past 12 months; one is about household tasks, such as washing clothes, cleaning the house, cooking meals, and the other is about personal care tasks, such as bathing and dressing. If the parent has received either of these two supports, it is scored as one, zero is scored for no support received (reference). (3) Emotional support. There were three questions to assess the quality of each parent-son relationship; these are adapted from the Affectual Solidarity Inventory (Mangen, Bengtson and Landry 1988). The parent respondents were asked (a) Taking everything into consideration, how close do you feel to (this child)? (b) How much do you feel that (this child) would be willing to listen when you need to talk about your worries and problems? (c) Overall, how well do you and (this child) get along together? We coded the items as follows: one is not at all close/ not at all/ not well, two is somewhat close/ somewhat/ somewhat well, and three is very close/ very much/ very well. These were computed on an additive scale that ranged from three to nine for each son. We treat this as a continuous variable. (d) Co-residence. The parent respondents were asked “Do you live with this child now?” We scored the answer “no” as zero and “yes” as one, with the former used as the reference.

Independent variables—Son's marital status has two types: married men and older unmarried men, namely those who were older than 28 years old, because most men marry between the ages of 22 and 27 in rural China (Liu, et al., 2014; Zhang & Zhong, 2005). Our previous research based on the same data showed that the probability of first marriage for rural men decreases sharply at age 28 and above, and drops to almost zero when they are older than 34 (Liu et. al., 2014). We scored the former as zero and the latter as one, with the

category of married as the reference. Mutual intergenerational support: the parent respondents were asked whether they have provided financial, instrumental support to each child, and we scored the answer “no” as zero and “yes” as one, with the category of no support as the reference. Parents’ socio-economic status was measured by education (1= illiterate, 0= primary school and above), occupation (1=non-agriculture, 0= agriculture) and income. We represented income as the log of the RMB value (+1) of the respondent and spouse’s total income in the past 12 months. Parents’ health status was measured by self-reported health; the parent respondents were asked to rate their health on a three-point scale ranging from poor, fair to good. We used two dichotomous variables to represent each of the first two categories, with the good health as the reference for each. For survival of the parent’s spouse, we asked the parent respondents “is your spouse still alive?” The answer “no” is scored as zero, and “yes” is scored as one. Sons’ socio-economic status is also measured using education, occupation and income, and is different from the parental classification of education and income, because with social development, the children’s generation has received more education than their parents. We therefore divided sons’ education into three levels: junior high school and above, primary school, and illiterate. We used two dichotomous variables to represent each of the first two categories, with the illiterate as the reference group. Since the parents may not know each child’s actual total income, the parent respondents were asked “Compared with others in your village, to which level does this child’s income belong?” The response is: above average, average or below average. We used two dichotomous variables to represent each of the first two categories, with below average as the reference group.

Other Control variables—These include parents’ and sons’ personal factors, for example, age, number of children, and we treat these as continuous variables.

The specific variables are listed in Table 1, which presents the descriptive statistics for the above-mentioned variables. In rural China, financial support is the main upward flow from sons to parents; more than half of rural parents have received financial support from their sons, but only 20 per cent of parents have provided financial support to sons. The proportions of instrumental support from sons to parents and from parents to son were 39% and 45%, respectively. Emotional support was high with an average score of 7.08, which means sons and parents had a strong relationship. For intergenerational living arrangements, we found that about 36 per cent of sons lived with parents. Most parents (71%) have never received any formal education, 18 per cent of parents were engaged in non-agricultural work, nearly one-third of parents were in a poor health, and 69 per cent of the respondent parents’ spouses were still alive. The average age of respondent parents in the sample was 65.4 years. The majority of sons had formal education, were engaged in non-agricultural work, and 66 per cent of the son’s incomes were at the average level. The average age of sons was 39.48 years old.

Results

Descriptive Results

Table 2 shows the means or percentages of variables according to son's marital status. From the perspective of support of parents by sons, son's marital status has a significant effect on financial support, but differences in instrumental support and emotional support are not significant. Married sons provided a higher proportion of financial support to parents than older unmarried sons (69.64% and 38.41%), which was consistent with married sons being better off economically than older unmarried sons (Ebenstein & Sharygin, 2009).

Older unmarried sons provided a higher proportion of instrumental support to parents (42.75% and 38.25 %), but the difference is not statistically significant. For emotional support, married sons have a better relationship with parents than older unmarried sons (6.91 and 7.12), but this difference is also not statistically significant. The finding that 82.61 per cent of older unmarried sons lived with their parents is surprising as the literature on the traditional Chinese family strongly suggests that parents are more likely to live with married sons (Xie & Zhu, 2006). Son's unmarried status has significantly changed the traditional family residential mode in China. On the other hand, there is also a statistical difference by son's marital status in financial and instrumental support from parents to sons. Parents provided a higher proportion of financial and instrumental support to married sons than to older unmarried sons. It is possible that married sons have their own families, especially their own children, whose needs are greater than those of single older unmarried sons.

Among the personal characteristics, except for parents' education, occupation and income, other characteristics differed by marital status. In general, married son's parents have higher socio-economic status than older unmarried son's parents. Compared with married son's parents, older unmarried son's parents were in a worse situation, had lower education, lower income, poorer health, a higher proportion of widowhood, and were older. The main reason for this is that most of the older unmarried sons' families were very poor. Also, older unmarried son's socio-economic status was also lower than married sons; 40.58 per cent of older unmarried sons have never received formal education, and half of them work in agriculture. In addition, even their parents admitted that their older unmarried son's income was below the average of the village. These are in keeping with previous literature, which has reported that the consequences of marriage squeeze have mainly been borne by underprivileged men in rural China (Li & Lavelly, 1995). From these descriptive results, it is difficult to estimate the effect of son's marital status on these variables; thus, it is necessary to conduct multivariate analyses.

Multivariate Results

Table 3 shows results of multivariate analyses predicting four types of intergenerational support of sons to their parents according to different son's marital status. First, the exchange theory for son's marital status (*Hypothesis 1*) is strongly supported by multivariate estimates for financial support, but not for instrumental support, emotional support, or co-residence. Compared to married sons, old unmarried sons provided less financial support to their parents, and sons' marital status has the most significant effect on their financial

support to parents. For intergenerational support from parents to sons, these models reveal that sons who received help from parents provided more intergenerational support to parents than sons who did not, which confirms *Hypothesis 2*. In keeping with the altruism theory of *Hypothesis 3*, our multivariate estimates show that sons are more likely to provide financial support to parents who have lower income, lower education, poor health, or who are widowed.

Discussion

A possible reason why married sons provided more financial support to their parents is that parents have provided more financial support to married sons in bride prices, betrothal gifts, housing and so on, and marriage can improve sons' family status, which gives married sons greater ability to repay their parents. But forced bachelors received less marriage help from their parents and have limited earning power, which limits how much financial help they can give to their parents. Greater financial support to sons tended to enhance financial returns from them, which is consistent with the exchange hypothesis. Sons' marital status also has a significant effect on their co-residence with parents; this is just the opposite situation to that suggested by *Hypothesis 1*: older unmarried sons are more likely to live with parents than married sons. According to tradition, when a son establishes a financially independent household, usually by physically moving to a new house, it marks a culturally recognized shift in family relations, referred to as "family division" (*fēn jiā*), and the parents still live with the unmarried son. Because the parents will still be working until the unmarried son gets married, co-residence will facilitate instrumental and emotional support between parents and sons, which is perhaps another way for parents to obtain resources from sons when the former become old.

In addition, it is interesting that older unmarried men and married men did not differ in their instrumental support and emotional support to parents; these are not consistent with the hypotheses. With respect to instrumental support, perhaps older unmarried men can replace the traditional supporting function of daughters-in-law for parents in some ways, so their unmarried status does not prevent these older men from providing instrumental support for their parents. But receiving instrumental support provided by older unmarried men still leaves irreparable regret for parents, because they have not finished the task bequeathed by their ancestors, and they can't guarantee that their family will have a flourishing future. As for emotional support, many parents thought there was a better relationship with their son(s), even with their older unmarried sons. This might be different if we were to survey emotional support from the adult childrens' perspective, because according to previous qualitative research, older unmarried sons attribute their unmarried status to their parents, which causes disputes that weaken the relationship with parents (Zhang & Zhong, 2005). The findings confirm *Hypothesis 2*, which agrees with those of other studies in Taiwan, Japan, and Malaysia (Lee *et al.* 1994; Lee & Xiao, 1998; Morgan & Hiroshima, 1983). The exchange theory is initially validated: financial support from parents to sons is positively correlated with that from sons to parents, and sons who received financial support or instrumental support from their parents return more such support to their parents. Sons who received financial support from their parents had better relationships with their parents, and co-residence facilitated instrumental support received by sons. The altruism theory of

Hypothesis 3 is confirmed, which is consistent with previous studies in China (Logan & Bian, 2003; Xie & Zhu, 2006). However, there is no evidence of altruism in other types of support. Parents who have less education or poor health had worse emotional relationships with their sons, but lower income helps in receiving emotional support from sons. Perhaps communicating with low-literacy parents is difficult for sons: less communication causes poorer relationships. As regards health, it has been demonstrated that parents who are in poorer health usually need more physical care from children, which not only reduces the elders' independence, but also adds to the burden of children (Reinhardt, Boerner, & Horowitz, 2006; Silverstein, Chen, & Heller, 1996). In this case, the loss of emotional affinity between parents and sons is easier to understand. Further, compared with parents whose spouses are alive, frail widowed parents are more likely to live with sons, which is compatible with the altruism theory of *Hypothesis 3* again. Generally speaking, *Hypothesis 3* was partly supported.

Finally, except for co-residence, strong interdependencies among other types of intergenerational support were found. Financial support, instrumental support and emotional support from sons to parents complement and reinforce each other; these are positively associated. Co-residence with parents complements instrumental support and emotional support, but not financial support, which is consistent with previous research (Xie & Zhu, 2006). This may be because when sons co-reside with their parents, they share a common economic life and house, "cooking on the same kitchen stove", as the saying goes. In this case, it is difficult to distinguish financial support to parents. Sons' own characteristics also have important affects on their support to parents; those engaged in non-agricultural occupations and with higher incomes are more likely to provide more financial support to their parents than those engaged in farming or with lower than average income, which is consistent with previous research in rural China (Song, 2005; Zhang & Li, 2004).

As to the issue of causality between children's marital status and current intergenerational transfers, some may argue that co-residing with parents and emotional ties with parents could possibly prevent children from getting married. Since children's marital status was established before co-residence with parents had been decided, it is unlikely that co-residence (and concomitant emotional ties) actually prevents these sons from marrying. This residence arrangement is a consequence rather than a cause of becoming a forced bachelor. Moreover, according to our previous research (Liu et al., 2014), men with lower socio-economic status and less resources, having no matchmaking network, introverted personality, being disabled, having many brothers, and coming from a poor community, are more likely to be disadvantaged and excluded from the marriage market. Co-residing with parents and emotional ties with parents are not the determinants of children's remaining unmarried, but terminating a child's bachelorhood by marriage is regarded as essential for continuity of the male line and as the main source of old-age support for parents. Indeed, childlessness is an unforgivable sin in Chinese Confucian ideology concerning filial piety (Jin, et al., 2013; Liu et al., 2014; Zhang & Zhong, 2005).

Conclusion

The forced bachelors aged 28 and above at the time of our survey are not the victims of the abnormally high SRB prevalent since the mid-1980s. They are just one outcome of the marriage squeeze, and analyzing the current forced bachelors may help to understand the extent and potential effects on China's rapidly aging society of the future marriage squeeze. The difficulties faced by forced bachelors in old-age support are likely to be more serious when the large numbers of surplus men born after the mid-1980s mature into marriageable age. This has raised concerns about whether a son's failure to get married will cause a crisis of support when parents become old. Based on theories of exchange and altruism, the main purpose of this paper is to explore the influence of rural son's marital status on the intergenerational support between parents and sons.

Our multivariate regression analysis shows that sons' marital status has a significant effect on both the probability of providing financial support to their parents and of co-residence with parents. Forced bachelors are less likely to provide financial support to parents than married sons, which shows an effect of the marriage squeeze in rural China on intergenerational support of exchange. These rural parents had not invested enough in education of sons who became forced bachelors or in helping them to get married. These tend to limit these sons' earning ability and how much financial help they can give to their parents. Parents invested more in their married sons education and bride price or a new house, which improves the married sons' ability to repay their parents. These findings support the exchange theory. With an unreliable social security system and son-based family old-age support, many parents still rely on children's financial support to cope with daily life. The growing population of forced bachelors will add to burden on society for supporting the elderly, because both old parents and their forced bachelor sons are more vulnerable financially and lack primary caregivers, namely daughters-in-law and wives, respectively.

Besides the crisis of support, the emergence of large numbers of forced bachelors has also changed traditional living arrangement for parents, extending the co-residence duration between unmarried sons and parents. In a normal rural family, if all the sons get married, parents usually live with one of married sons, and the parents can enjoy the support provided by that son and the daughter-in-law. But if a son remains unmarried, since there are not enough assisted living and institutional care options in rural China, these parents have no choice but to live with the forced bachelors, without daily care from a daughter-in-law, which may cause the parents' welfare to suffer. Those parents who co-reside with their unmarried sons are unlikely to receive enough financial support but are likely to exchange more frequent instrumental help with their unmarried sons, which also supports the exchange theory. From the short-term perspective, that is over the past twelve months, intergenerational support between parents and sons shows obvious characteristics of exchange, which is largely reflected in mutual support in everyday life. Parents who gave their sons financial or instrumental support tend to receive more such support from their sons. This short-term intergenerational support is beneficial for both parents and sons, with parents providing financial and household help to sons while sons take care of parents' needs, which also support the exchange theory.

Our research also confirmed the altruism theory, that parents' need is a very important factor in their access to intergenerational support. If parents are in a bad situation, children are more likely to provide financial support in order to improve their parents' well-being. But other types of intergenerational support may not show these characteristics. A possible reason for this is that in economically backward rural areas in China, financial support is at the heart of intergenerational support. Parents' need for instrumental support or emotional support has not received enough attention. In the absence of formal pension plans, the rural elderly in China expend a great deal of effort to sustain the asset base of their own and their children's households until they die (Pang, Brauw, & Rozelle, 2004). However, even in this situation, previous research has found that many Chinese parents still rely on their children's financial support to cope with daily expenditures (Shi, 1993; Xu & Yuan, 1997).

In order to improve the well-being of elderly parents in rural areas, it might be reasonable for the government to provide more assisted living or homes for the elderly and expand the pension schemes for the elderly in rural areas in order to help the elderly with forced bachelor sons. Also during the process of improving the old-age security system, the government should introduce gender equality into the old-age security system, for instance, by strengthening daughter's old-age supporting function and giving daughters the right of inheritance. Such actions may help to weaken son preference and reduce the number of older unmarried men in rural China. At the same time, increasing sons' socio-economic resources through some financial aid from local governments may also result in increased intergenerational support to help elderly parents' security.

Our findings may also help policymaking in the context of a weak social security system and a rapidly growing population of forced bachelors, as a demographic consequence of the abnormally high sex ratio at birth. This may especially relevant for those forced bachelors who were born after 1980 and who are the victims of the male marriage squeeze driven by the high sex ratio at birth. However, this can only be tested in 10 or 20 years when the population of forced bachelors caused by imbalance in the SRB since 1980 becomes large enough.

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References

- Becker G. A theory of social interactions. *Journal of Political Economy*. 1974; 82(6):1063–1093.
- Bernheim B, Shleifer A, Summers L. The strategic bequest motive. *The Journal of Political Economy*. 1985; 93(6):1045–1076.
- Chen F. Residential patterns of parents and their married children in contemporary China: A life course approach. *Population Research and Policy Review*. 2005; 24(2):125–148.
- Chen, J. The effect of parental investment on old-age support in urban China. In: Whyte, MK., editor. *China's revolutions and intergenerational relations*. University of Michigan Press; Ann Arbor, MI: 2001.
- Chen X, Silverstein M. Intergenerational social support and the psychological well-being of older parents in China. *Research on Aging*. 2000; 22(1):43–65.

- Chen, Y. Perspectives on China's and EU Marriage Market. Nanjing University Press; Nanjing: 2004. (in Chinese)
- Coale A, Banister J. Five decades of missing females in China. *Demography*. 1994; 31(3):459–479. [PubMed: 7828766]
- Cohen M. Lineage organization in north China. *The Journal of Asian Studies*. 1990; 49(3):509–534.
- Cohen M. North China rural families changes during the communist era. *Etudes Chinoises*. 1998; 17(1):59–154.
- Cong Z, Silverstein M. Intergenerational support and depression among elders in rural China: Do daughters-in-law matter? *Journal of Marriage and Family*. 2008; 70(3):599–612.
- Cong Z, Silverstein M. Intergenerational exchange between parents and migrant and nonmigrant sons in rural China. *Journal of Marriage and Family*. 2011; 73(1):93–104.
- Cox D, Eser Z, Jimenez E. Motives for private transfers over the life cycle: An analytical framework and evidence for Peru. *Journal of Development Economics*. 1998; 55(1):57–80.
- Davin, D. Internal Migration in Contemporary China. Palgrave MacMillan Press; Hampshire: 1999.
- Davis, D. Urban households: Supplicants to a socialist state. In: Davis, D., Harrell, S., editors. *Chinese families in the post-Mao era*. University of California Press; California: 1993. p. 50-76.
- Ebenstein AY, Sharygin EJ. The Consequences of the "Missing Girls" of China. *The world bank economic review*. 2009; 23(3):399–425.
- Eggebeen DJ, Hogan DP. Giving between generations in American families. *Human Nature*. 1990; 1(3):211–232. [PubMed: 24222083]
- Fan C, Huang Y. Waves of rural brides: Female marriage migration in China. *Annals of the Association of American Geographers*. 1999; 88(2):227–251.
- Fei, H. *Peasant Life in China*. Hesperides Press; London: 2006.
- Frankenberg E, Lillard L, Willis RJ. Patterns of intergenerational transfers in Southeast Asia. *Journal of Marriage and Family*. 2002; 64(3):627–641.
- Gates, H. *China's Motor: A Thousand Years of Petty Capitalism*. Cornell University Press; Ithaca, New York: 1996.
- Goldstein, H. *Multilevel models in education and social research*. Oxford University Press; London, England: Charles Griffin and Co; New York, NY, US: 1987.
- Graham M, Larsen U, Xu X. Son preference in Anhui province, China. *International Family Planning Perspectives*. 1998; 24(2):72–77.
- Hermalin, A., Ofstedal, M., Chang, M. Types of supports for the aged and their providers in Taiwan. In: Hareven, TK., editor. *Aging and Generational Relations over the Life Course: A Historical and Cross-Cultural Perspective*. Berlin, New York: de Gruyter; 1996. p. 400-437.
- Jin X, Liu L, Li Y, Feldman MW, Li S. 'Bare branches' and the marriage market in rural China: Preliminary evidence from a village survey. *Chinese Sociological Review*. 2013; 46(1):83–104. [PubMed: 26213641]
- Koh SK, MacDonald M. Financial reciprocity and elder care: Interdependent resource transfers. *Journal of Family and Economic Issues*. 2006; 27(3):420–436.
- Kohli, M., Künemund, H. Intergenerational transfers in the family: What motivates giving. In: Bengtson, VL., Lowenstein, A., editors. *Global aging and challenges to families*. New York: Aldine de Gruyter; 2003. p. 123-142.
- Lee YJ, Xiao Z. Children's support for elderly parents in urban and rural China: Results from a national survey. *Journal of Cross-Cultural Gerontology*. 1998; 13(1):39–62. [PubMed: 14617918]
- Lee YJ, Parish WL, Willis RJ. Sons, Daughters, and Intergenerational Support in Taiwan. *American Journal of Sociology*. 1994; 99(4):1010–1041.
- Li JH, Lavelly W. Rural economy and male marriage in China: Jurong, Jiangsu 1933. *Journal of Family History*. 1995; 20(3):289–306.
- Li S, Feldman MW, Jin X. Children, marriage form, and family support for the elderly in contemporary rural China. *Research on Aging*. 2004; 26(3):352–384.
- Li, S., Jiang, Q., Feldman, MW. *Gender Discrimination and Population Development*. Social Sciences Academic Press; Beijing: 2006. (in Chinese)

- Lin I, Goldman N, Weinstein M, Lin Y, Gorrindo T, Seeman T. Gender differences in adult children's support of their parents in Taiwan. *Journal of Marriage and the Family*. 2003; 65(1):184–200.
- Liu L, Jin X, Brown MJ, Feldman MW. Involuntary bachelorhood in rural China: A social network perspective. *Population*. 2014; 69(1):103–126.
- Logan J, Bian F. Parents' needs, family structure, and regular intergenerational financial exchange in Chinese cities. *Sociological Forum*. 2003; 18(1):85–101.
- Mangen, D., Bengtson, VL., Landry, PH, Jr. The measurement of intergenerational relations. Beverly Hills, CA: Sage; 1988.
- Mason K. Family change and support of the elderly in Asia: What do we know? *Asia-Pacific Population Journal/United Nations*. 1992; 7(3):13–32.
- Meng, L. Bride drain: Rising female migration and declining marriage rates in rural China. 2009. Available from http://iar.shufe.edu.cn/upload/_info/31031_0910120912571.pdf
- Min H, Eades J. Brides, bachelors and brokers: The marriage market in rural Anhui in an era of economic reform. *Modern Asian Studies*. 2008; 29(4):841–869.
- Mo, L. Research on the Consequences of Abnormally High Sex Ratio at Birth. China Population Press; Beijing: 2005. (in Chinese)
- Morgan S, Hiroshima K. The persistence of extended family residence in Japan: Anachronism or alternative strategy? *American Sociological Review*. 1983; 48(2):269–81.
- Pang L, de Brauw A, Rozelle S. Working until you drop: The elderly of rural China. *The China Journal*. 2004; 52:73–94.
- Pei X, Pillai V. Old age support in China: The role of the state and the family. *The International Journal of Aging and Human Development*. 1999; 49(3):197–212. [PubMed: 10660078]
- Poston D, Glover K. Too many males: Marriage market implications of gender imbalances in China. *Genus*. 2004; 61(2):119–140.
- Reinhardt JP, Boerner K, Horowitz A. Good to have but not to use: Differential impact of perceived and received support on well-being. *Journal of Social Personal Relationships*. 2006; 23(1):117–129.
- Riley NE. Interwoven lives: Parents, marriage, and Guanxi in China. *Journal of marriage and the family*. 1994; 56(4):791–803.
- Secondi G. Private monetary transfers in rural China: are families altruistic? *The Journal of Development Studies*. 1997; 33(4):487–511.
- Shi L. Family financial and household support exchange between generations: A survey of Chinese rural elderly. *The Gerontologist*. 1993; 33(4):468–480. [PubMed: 8375675]
- Silverstein M, Chen X, Heller K. Too much of a good thing? Intergenerational social support and the psychological well-being of older parents. *Journal of Marriage and the Family*. 1996; 58(4):970–982.
- Song J. A comprehensive review of studies on old-supporting problems in rural China. *Population Research*. 2005; 25(6):64–9. (in Chinese).
- Spitze G, Logan J. Sons, daughters, and intergenerational social support. *Journal of Marriage and the Family*. 1990; 52(2):420–430.
- Sun R. Old age support in contemporary urban China from both parents' and children's perspectives. *Research on Aging*. 2002; 24(3):337–359.
- Wang YS. Intergenerational relations in the arrangements for marriage: the accumulation and transition of family wealth, a village survey of the east Hebei. 2010; 3:60–72.
- Whyte, M. Filial obligations in Chinese families: Paradoxes of modernization. In: Ikels, C., editor. *Filial piety: Practice and discourse in contemporary East Asia*. Stanford University Press; California: 2004. p. 106–127.
- Weinstein M, Sun TH, Chang MC, et al. Household composition, extended kinship, and reproduction in Taiwan: 1965–1985. *Population Studies*. 1990; 44(2):217–239. [PubMed: 11622322]
- Wolf, AP. Gods, ghosts, and ancestors. In: Wolf, AP., editor. *Religion and Ritual in Chinese Society*. Stanford University Press; California: 1974. p. 131–182.
- Wolf, AP., Huang, C. *Marriage and Adoption in China, 1845–1945*. Stanford University Press; California: 1980.

- Xie, Y., Zhu, H. Population Studies Center Research Report 06–607. 2006. Do Sons or Daughters Give More Money to Parents? Gender and Intergenerational Support in Contemporary Urban China.
- Xu, Q., Yuan, Y. The role of family support in the old-age security in China. 23rd IUSSP general population conference: Symposium on demography of China; Beijing: C. P. Association. Xin Hua Press; 1997. p. 265-273.
- Ye ZW, Lin QG. The causes and countermeasures of the old unmarried in China. Chinese Journal of Population Science. 1998; 4:16–22. (in Chinese).
- Zhang H. Bracing for an uncertain future: a case study of new coping strategies of rural parents under China's birth control policy. The China Journal. 2005; 54:53–76.
- Zhang C, Zhong Z. Analysis of the causes of involuntary bachelors in rural China. Youth Studies. 2005; 1:17–19. (in Chinese).
- Zhang W. Dynamics of marriage change in Chinese rural society in transition: A study of a northern Chinese village. Population Studies. 2000; 54(1):57–69. [PubMed: 28489523]
- Zhang W, Li S. A study on intergenerational support of the elderly in rural Chinese families. Statistical Research. 2004; 5:33–37. (in Chinese).

TABLE 1

Descriptive statistics for sons (*N=421 Parents With 823 Sons*)

Variable	Mean	SD	Coding Scheme and Range
<i>Dependent Variables</i>			
Son-to-Parent			
Financial support (No)	0.64		0(no support),1(support)
Instrumental support (No)	0.39		0(no support),1(support)
Emotional support	7.08	1.38	3–9
Co-residence	0.36		0(no co-residence),1(co-residence)
<i>Independent Variables</i>			
Older unmarried son(Married)	0.17		0(married),1(older unmarried)
Parent-to-son			
Financial support (No)	0.21		0(no support),1(support)
Instrumental support (No)	0.45		0(no support),1(support)
Parent's characteristics			
Parent's socio-economic status			
Education(Primary school and above)			
Illiterate	0.71		0,1
Occupation(Agriculture)			
Non-agriculture	0.18		0,1
Income(ln+1)	6.65	3.35	0–11.29
Income(yuan)	5039.05	7585.55	0–80000
Parent's health status(Good)			
Fair	0.43		0,1
Poor	0.30		0,1
Spouse's status(Alive)			
Not live	0.31		0,1
Age	65.40	9.04	48–91
Number of children	3.28	1.14	1–7
Son's socio-economic status			
Education(Illiterate)			
Primary school and above	0.26		0,1
Junior school and above	0.59		0,1
Occupation(Agriculture)			
Non-agriculture	0.65		0,1
Income(Below average)			
Average	0.66		0,1
Above average	0.10		0,1
Age	39.48	7.35	28–59
Sample size	823		

Data source: Survey in X county of Anhui province in 2008.

TABLE 2

Means and percentages of variables by son's marital status

Variable	Older unmarried	Married	LR/T test
Son-to-Parent			
Financial support (%)			
Yes	38.41	69.64	***
No	61.59	30.36	
Instrumental support (%)			
Yes	42.75	38.25	ns
No	57.25	61.75	
Emotional support score(3–9)	6.91	7.12	ns
Co-residence			
Yes	82.61	26.57	***
No	17.39	73.43	
Parent-to-son			
Financial support (%)			
Yes	13.04	22.19	*
No	86.96	77.81	
Instrumental support (%)			
Yes	37.68	45.99	+
No	62.32	54.01	
Sample size	138	685	
Parent's characteristics			
Parent's socio-economic status			
Education (%)			
Illiterate	75.76	70.42	ns
Primary school and above	24.24	29.58	
Occupation (%)			
Agriculture	81.82	82.25	ns
Non-agriculture	18.18	17.75	
Income(In+1)	5.90	6.78	*
Income (yuan)	3839.39	5262.71	ns
Parent's health status (%)			
Good	24.24	32.11	*
Fair	36.36	43.94	
Poor	39.39	23.94	
Spouse's status (%)			
Alive	59.09	70.99	+
Not alive	40.91	29.01	
Age (year)	70.56	64.43	***
Number of children	3.33	3.27	ns
Sample size	66	355	

Variable	Older unmarried	Married	LR/T test
Son's characteristics			
Son's socio-economic status			
Education (%)			
Illiterate	40.58	10.22	***
Primary school and above	29.71	24.82	
Junior school and above	29.71	64.96	
Occupation (%)			
Agriculture	48.55	32.26	***
Non-agriculture	51.45	67.74	
Income (%)			
Below average	68.84	14.89	***
Average	28.99	74.01	
Above average	2.17	11.09	
Age (year)	41.01	38.97	***
Sample size	138	685	

Data source: Survey in X county of Anhui province in 2008.

Notes

p<0.001;

**
p<0.01;

*
p<0.05

+
p<0.1;

NS, p>=0.1; Ns: not significant.

TABLE 3

Random-effects models of providing help by son's marital status

Son-to-Parent	Financial	Instrumental	Emotional	Co-residence
Marriage				
Unmarried(married)	-2.143 ***	0.595	0.077	3.886 ***
Parent-to-son				
Financial support(No)	1.641 ***	0.045	0.201 +	-0.029
Instrumental support(No)	0.080	3.587 ***	0.010	1.202 ***
Son-to-Parent				
Financial support(No)		0.963 **	0.447 ***	0.035
Instrumental support(No)	1.133 **		0.252 **	1.018 ***
Emotional support	0.644 ***	0.363 **		0.262 **
Co-residence(No)	0.206	1.307 ***	0.290 **	
Parent's characteristics				
Parent's socio-economic status				
Education(Primary school and above)				
Illiterate	0.878 +	-0.223	-0.285 *	0.010
Occupation(Agriculture)				
Non-agriculture	-0.106	-0.357	0.104	-0.027
Income(In+1)	-0.134 +	0.068	-0.048 *	-0.027
Health(Good)				
Fair	0.382	0.082	-0.291 *	-0.047
Poor	1.424 *	0.681	-0.499 **	-0.010
Age	-0.058	-0.015	-0.005	0.016
Spouse's status(Alive)				
Not alive	0.910 +	-0.233	-0.145	0.735 *
Number of children	0.101	0.049	-0.035	-0.410 ***
Son's characteristics				
Son's socio-economic status				
Education(Illiterate)				
Primary school and above	0.794	0.440	0.036	-0.235
Junior school and above	0.625	0.356	0.166	-0.177
Occupation(Agriculture)				
Non-agriculture	0.713 *	-0.564 +	-0.010	-0.206
Income(Below average)				
Average	1.145 **	0.663 +	0.067	-0.166
Above average	1.172 +	1.447 **	0.337 *	0.237
Age	0.055 +	0.063 *	0.002	-0.120 ***
Sigma_u	2.883	1.660	1.074	0.664

Son-to-Parent	Financial	Instrumental	Emotional	Co-residence
Sigma_e			0.703	
Rho	0.716	0.456	0.700	0.118
Log likelihood	-400.414 ***	-366.623 ***	-1222.487 ***	-346.731 ***
Wald chisquare	70.75	100.75		101.80
LR chisquare			104.40	
D.F.	20	20	20	20
Observations	823	823	823	823
Number of household	421	421	421	421

Data source: Survey in X county of Anhui province in 2008.

Notes:

p<0.001;

**
p<0.01;

*
p<0.05;

+
p<0.1;

NS, p>=0.1; Ns: not significant;