

Labor Force Participation and Hours of Work of Western China's Rural Elders\

PRELIMINARY DRAFT

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The aging of the Chinese population and extensive migration of rural residents to urban areas are the two most important demographic phenomena of late 20th century, early 21st century China. By 2000, China was already in the ranks of aging societies as defined by Cai *et al*, (2012, p.12) as those with at least 10 percent of their population aged 60 and above and 7.5 percent aged 65 and above. By 2010, 14 percent of China's population was 60 years of age or older. The share of this age group is expected to increase to 20 percent by 2020 and 27 percent by 2030 (Wang, 2012). The labor migration of young workers from rural to urban China, which began in the mid-1980s and grew in earnest in the 1990s with the increased demand for labor in the growing export and service economies and easing of *hukou* regulations, has since expanded in all dimensions. The average age of migrants is increasing, the length of time migrants stay in the urban areas is lengthening, their sex ratio has shifted to be more reflective of sending communities, and the list of places of origin has expanded greatly. Official government statistics put the number rural migrants employed in cities at 79 million in 2000 and 163 million in 2012 (NBS 2012a cited in World Bank SRs4-7, 2014). In 2013, the floating population reached 245 million and rural migrants workers accounted for 44 percent of total urban employment (World Bank, SRs4-7, p.265). The aging of the rural population coupled with the massive out migration of young people from the countryside raises concerns about who will replace and refresh the rural labor force.

At the same time, the notion of retirement is non-existent in many developing countries--particularly in rural areas. Giles, Wang and Cai (2011) compare the labor supply and retirement behavior of Chinese elders to that of elders in Indonesia and Korea, and the United States and the United Kingdom. They find that in Korea, Indonesia, and China rural elders are less likely to retire than urban elders. Rather, Connelly *et al* (2014) find, based on Chinese population census data, that rural China's elders' labor force participation increased between 1982 and 2000. They find that the participation rate of rural men, age 50 to 74, increased from 71 percent to 79 percent over the 18 year period, while rural women's increased, remarkably, from 28 percent to 59 percent. Previous research suggests that the increase in rural Chinese elders' labor force participation stems from a combination of increased market incentives, definitions of work that are more market driven, better health, increased economic uncertainty, and the migration of younger workers to urban areas.

In this paper, we examine the role that culture, in conjunction with more standard economic and demographic characteristics, plays in labor force participation decisions of China's rural elders. Cultural differences are proxied here by specific ethnic minority membership. Based on the age profile of labor force participation rates, the age range 50 to 74 is a time of

heightened decision-making with regard to elders' labor force participation and thus a particularly good lens with which to view the effects of culture on those decisions. At younger ages, almost all rural residents are "in the labor force," that is, engaged in labor for the purpose of earning income--either directly or in the production of commodities which will be offered for sale. By age 75 few remain in the labor force. Thus, by focusing on rural residents between the ages of 50 and 74, we capture the segment of the population actively making decisions about continuing to work or not.

That culture plays a role in labor force participation decision-making seems a reasonable hypothesis. Economists have recently begun to pay closer attention to the role of culture in explaining differing responses of individuals to similar economic incentives.¹ The decision about when to retire may depend in part, on what one's neighbors are doing, or on expectations that are picked up in infancy, education, and socialization: expectations about elder care, living arrangements, and filial piety among other things.

Previous research has found differences in labor force participation by ethnicity in China. (Maurer-Fazio, Hughes and Zhang, 2007, 2010; Connelly, Maurer-Fazio and Zhang, 2014) Each of these papers is based on the 2000 Chinese Population Census, which has no information on earnings, and almost none on wealth and health. Until now, though, census data was the only source of data with enough observations to analyze multiple ethnic minority groups separately. This changed with the collection of the 2011 Chinese Household Ethnic Survey (CHES), which we employ here. We focus on rural elders and thus restrict our use of the data to its rural sub-sample. Nine minority ethnic groups have large enough sample sizes for inclusion in our analysis: Mongolian, Hui, Tibetan, Uygur, Miao, Zhuang, Dong, Yao and Tujia. Members of other ethnic minorities are aggregated and included in a category, "other." All 10 groups are compared to the Han, which constitutes the majority even in this minority rich survey.

In the analysis presented below we find that cultural differences, proxied by ethnic group membership, play a significant role in the labor force participation decisions of China's rural elders. Large differences in labor force participation by minority group membership exist in the simple descriptive analysis. Most of these differences remain even after we control for economic and demographic characteristics. For men, the marginal effect of ethnicity on labor force participation is significant for seven of our ten specific ethnic groups: Mongolian, Uygur, Miao, Zhuang, Dong, Yao, and Tujia. Each of these groups has significantly higher rates of labor force participation than the Han. For women, eight of the ethnic groups in our data have rates that are different from the Han. The Hui and Uygur female elders have lower rates of participation, while the Mongolian, Miao, Zhuang, Dong, Yao and Tujia have higher rates. In addition, we find that the interaction of ethnicity and age affects labor force participation in significant ways.

¹ See Burda, Hamermesh and Weil (2013) for a model of the cultural components of gender work differences. Blau et al (2013) finds substantial transmission of gender norms across generations of immigrants to the U.S. affecting decisions such as fertility and labor supply of women.

In the largely agricultural setting in which most of the rural CHES respondents live, elders rarely think of themselves, or define themselves, as retired. When asked about their employment status, the most common response offered as an alternative to working was not retirement, but rather, keeping house. When we consider different measures of work/employment status such as hours worked, or zero hours on and off the farm, over the previous year, our main results still hold. Elders' reported hours of work decline with age and differ in significant ways by ethnicity.

The rest of the paper proceeds as follows: Section 2 reviews the previous literature of Chinese elders' labor force participation and employment. Section 3 outlines the socio-economic, health and cultural factors expected to affect employment decision making among rural elders. Sections 4 and 5 examine the patterns of employment and hours decision making among the elders in the CHES data and Section 6 offers some conclusions based on the analysis.

II: Literature Review of Chinese Elders' Labor Force Participation

There is a lively academic literature on the labor force participation/retirement decision of adults between the ages of 50 and 74 around the world as it is the margin of change from mostly employed to mostly not employed. In most developed countries, labor force participation of these older adults fell substantially over most of the 20th century but increase a bit from its lowest levels in the last ten years. (Gendell, 2008) A similar pattern has been observed in urban China. (Giles, Wang, and Cai, 2011; Connelly, Maurer-Fazio, and Zhang, 2014) However, around the world the decisions of rural elders are often different from their urban counterparts, because of a combination of institutional differences including a lack of pensions and governmental social security support, the ease of moving in and out of agricultural employment, and the income and wealth gaps between urban and rural areas.

Recent analyses of the specific determinants of China's rural elders' labor force participation decision-making have considered the importance of wealth, pension availability, health, and coresidence with adult children, migration of adult children, as well as more standard socio-economic variables such as education, age and gender (Pang, deBrauw, and Rozelle, 2004; Giles, Wang, and Cai, 2011; Connelly, Maurer-Fazio, and Zhang, 2014).² Both Pang, deBrauw, and Rozelle (2004) and Giles, Wang, and Cai (2011) find a negative effect of pension availability on rural worker's labor force participation. For women, it is spouse's pension availability that matters, while for men it is own pension availability that matters (Giles, Wang,

² Giles, Wang and Cai (2011) analyze the rural population over age 45, Pang, deBrauw and Rozelle (2004) analyze the rural population over age 50 and Connelly et al (2014) analyze the rural population age 50 to 74. Pang, deBrauw and Rozelle (2004) control for gender differences with a simple dummy, while Giles, Wang and Cai (2011) and Connelly, Maurer-Fazio, and Zhang (2014) estimate their multivariate models separately for men and women. The data sources are: a specially collected survey of 60 villages in 6 provinces in 2000 (Pang, deBrauw and Rozelle); 2008 Chinese Health and Retirement Longitudinal Study (CHARLS) pilot survey from Gansu and Zhejiang provinces (Giles, Wang and Cai); and the 2000 Chinese Population Census, .095% sample compared to the 1982 Chinese Population Census 1% sample (Connelly, Maurer-Fazio, and Zhang).

and Cai, 2011). Pang, deBrauw, and Rozelle (2004) find that wealth has no effect on formal labor force participation, while Giles, Wang, and Cai (2011) find some evidence that rural women who live in houses of greater value are less likely to be employed.

Connelly, Maurer-Fazio and Zhang (2014) focus on the effect of elders' coresidence with their adult children and grandchildren on the probability of labor force participation. They find small negative effects of coresidence with adult children on both male and female elders' labor force participation when coresidence is assumed to be exogenous and much larger (in absolute value) negative effects when the endogeneity of coresidence is modelled. Pang, deBrauw and Rozelle (2004) also include (exogenous) coresidence with adult children and find that it has a significant negative effect on elders' labor force participation.

Age and gender are important predictors of labor force participation and/or employment in each of the three analyses discussed above. Labor force participation rates decline with age and are lower for women than men. The decline in labor force participation with age may be, in large part, health related, but we hypothesize that there is also a cultural dimension to this trend. Both Pang, deBrauw and Rozelle (2004) and Giles, Wang and Cai (2011) control for health status and yet still find significant negative effects of age on participation. Similarly, the differences between men's and women's participation are unlikely to be exclusively health related and are likely to be partially determined by cultural beliefs about gender roles. Below, we show that women do more hours of housework per day than men and that when hours of "market work" and housework are summed, women put in more hours of work than men at every age, regardless of labor force status.

Marital status is another important determinant of labor force participation in each of the three papers discussed above. Elders who are widowed are less likely to report being in the labor market than those whose spouses are living. Connelly, Maurer-Fazio, and Zhang (2014) find that widowhood is a strong predictor of coresidence with adult children. After controlling for the endogeneity of coresidence with adult children, they find an additional effect of marital status. That is, married male and female elders are more likely to be in the labor market than their non-married counterparts. Similarly, Pang, deBrauw and Rozelle (2004) find that married elders are more likely to continue to do commercial farm work.

Beyond their focus on coresidence with adult children and grandchildren, Connelly, Maurer-Fazio and Zhang (2014) also find that two area-level variables, both thought to capture some aspects of local gender norms-- the prefectural sex ratio of very young children and the prefectural gender gap in adult illiteracy rates (men's minus women's)--each increase women's labor force participation. Thus, older women who live in areas with greater male bias, by either measure, are more likely to be employed between the ages of 50 and 74 than those who live in areas with less male bias. However, the effect on older men's labor force participation differs by variable with no effect of the prefectural sex ratio of young children and a negative effect of the gender gap in adult illiteracy. The effects of these variables provide limited evidence that culture

affects labor force participation rates, even after controlling for individual demographic characteristics. In this paper we further explore the role culture plays in the labor force participation/hours worked decision making of Chinese rural elders by adding detailed information about the ethnic minority group of which the rural elder is a member.

III: Factors Affecting the Labor Force Participation Decisions of Contemporary Rural Elders

Given the findings of the research discussed above, we develop a model of elders' deliberate decision making with respect to their labor force participation that takes into account the context elders' interconnectedness with their adult children. Four aspects of elders' lives need to be considered. The first is their living arrangements. Related to this is the demand for elders' labor, particularly in agriculture. The second is wealth, income and poverty and how these factors affect elders' labor force participation. A third important consideration is how elders' health affects their employment, and the fourth is cultural constructs of aging and norms, proxied here by minority group membership as well as cultural constructs of gender and the interactions therein.

III.A: Living Arrangements and Demand for Elders' Labor

In a Western context, living with one's adult children is most often connected with elders' frailty or particular incapacities. This is certainly not the case in rural China. Connelly *et al* (2014) find that the rural elders residing in the counties included in CHES have high rates of coresidency with their adult children in 2000, and that these rates remain high in 2011. Although disability is positively related to coresidence, most elders live with their children long before they become disabled. Maurer-Fazio *et al* (2011) find that in urban China, coresidence with one's parents increases prime-aged women's labor force participation, providing circumstantial evidence that elders are helping with childcare and other housework. Connelly, Maurer-Fazio, and Zhang (2014) directly examine the effect of coresidence on the labor force participation of elders aged 50 to 74 using the 2000 Census and find that coresidence exerts a negative effect on labor force participation for rural, but not urban, elders.

Although China's rural elders' coresidence with adult children may not be primarily "caused" by incapacity, it is still important to consider their employment and coresidency decisions as jointly determined. Living with one's children reduces the transactions cost of many types of time transfers. Adult children are available "to do the heavy lifting," while the elders are around to hold the baby and feed the chickens. In addition, while coresidency provides more bodies to do the work, it also creates more tasks to do. How these tasks get divided in participants' minds between "housework" and "employment" is unclear *a priori*, but previous findings lead us to predict a decline in labor force participation with coresidency.

Widowhood is strongly associated with the coresidence of elders with their adult children in both rural and urban China (Connelly *et al* 2014). It also reduces labor force participation,

even after controlling for coresidence. (Connelly, Maurer-Fazio, and Zhang 2014, Pang, deBrauw, and Rozelle, 2004) Since other variables such as age are controlled for, the relationship between widowhood and labor force participation may reflect correlated health status. It may also reflect a cultural milestone: widowhood may signal a need to be cared for. In the analysis that follows, we are able to distinguish between these two hypotheses, given the availability of health information in the CHES data.

The demand for the elders' labor, within the household, is also affected by the labor decisions of their children regardless of whether they live together. In the rural Chinese context that we model, the two most important labor decisions of the younger generation are the decision to migrate and the decision to work off farm. Given that almost all rural families in the CHES sample are still farming, we expect that the younger generation's decisions to migrate and to work off farm will each increase the labor force participation of the older generation.

III.B: Income, Wealth and Poverty

Although standard economic models of labor supply are agnostic with respect to the effect of higher income on labor supply, they predict unambiguously that higher levels of wealth will reduce labor supply. The ambiguity of income's effect stems from opposing income (having more money to live on) and substitution (having a higher opportunity cost of one's time) effects. However, most practitioners expect that elder's labor force participation will decline with income, given that elders are much closer than the young or middle-aged to the decision margin of whether to continue with employment/work. Several variables have been employed by researchers to capture these wealth and income effects. Pang, deBrauw and Rozelle (2004) include education, per-capita income, and the amount of land (the amount of land being farmed affects demand for labor). Giles, Wang and Cai (2011) include education, average education of spouse and adult children, pension eligibility, spouse's pension eligibility, and housing wealth. Connelly, Maurer-Fazio, Zhang (2014) include education and provincial average per-capita income and GDP growth rates.

III.C: Health

In every society, labor supply declines with age as the aging process inevitably affects strength, balance, mobility, and energy levels. Even if rural Chinese "work until they drop," the intensity of work and the tasks engaged change and become less likely to be defined as labor force participation. Expectations about appropriate ages at which to work hard and at which to take it easy will, no doubt, be determined, in part, along cultural lines. Labor market institutions such as pension and insurance also exert age effects on labor supply through their eligibility/entitlement criteria.

We expect, in addition to age, that individuals' health status will also affect their employment. The CHARLS data used by Giles, Wang and Cai (2011) employs two levels of ADL scores to control for health status, "with difficulty" and "unable." Pang, deBrauw and

Rozelle (2004) include controls for individuals who report themselves “moderately ill” and “severely ill.” In these studies, the variables used to control for poor health exert strong negative effects on the labor force participation China’s rural elders.

III.D: Cultural Components

Culture and social norms affect how we view our set of life choices. We do not make individual decisions in a vacuum, but rather look around and see what other people are doing in similar circumstances. The issue of culture is particularly important here as how we care for our elders is an important part of who we are as people. Nor is there uniformity in the human approach to these issues. Some cultures value independence above collective destinies and are more likely to look for market solutions to care needs, while others rely on extended households to maintain the continuity of work and care of the young and the old.

In China, particular ethnic minorities have maintained their own cultures over long periods of time. In some places, minority groups are geographically isolated from one another, which has facilitated separate cultures. In other places, different minority groups live in close proximity to one another. Connelly *et al* (2014) analyze rural elders’ coresidency patterns and find that Tibetans, Uygurs, Zhuang, and Salar are each significantly more likely to live with their adult children than the Han.

Maurer-Fazio, Hughes and Zhang (2010) find substantial differences in labor force participation by ethnic minority status among China’s urban women aged 25 to 50. Using the 2000 Chinese census, they compare six ethnic groups (and an aggregated “other ethnic” category) to the Han majority. They find that Hui, Korean, Mongolian and Uygur women have lower labor force participation rates than the Han, while the Zhuang have higher rates than the Han. The Manchu and “other” do not differ from the Han. For men in this age group, they find labor force participation rates to be so high, across the board, that no ethnic differences are observed. When almost everyone works, differences between groups cannot be observed.

Using the same 2000 Chinese census data, Connelly, Maurer-Fazio and Zhang (2014) examine the labor force participation decisions of both urban and rural residents, aged 50 to 74, the age group in which most Chinese ultimately drop out of the labor force. They find that rural elders of Muslim minorities have higher labor force participation rates than others. It is interesting that the Muslim effects is negative for prime age urban women (Maurer-Fazio *et al*, 2011), while the Muslim effect is positive for older rural women. The CHES data, which underlie the analysis of this paper, allow us to look beyond the Muslim/Non-Muslim dichotomy of Maurer-Fazio *et al* (2011) and Connelly, Maurer-Fazio and Zhang (2014).

IV: Data

Our analysis uses the rural subsample of the 2011 CHES data. The analysis of labor force participation and hours of work is restricted to individuals between the ages of 50 and 74.

The first stage, estimation of coresidency with adult children, is based on a sample of all those aged 50 plus. The calculation of the prime-age, off-farm employment rates by county is based on individuals aged 16 to 49.

Labor force participation can be defined in several ways in the CHES data. For most of our analysis we use the respondents' answer to the question, "What was your work or study status during the last week in 2011?" If the respondent answered "working/ doing farm work/ engaged in family business activities" or "unemployed or waiting for a job assignment," we classify the respondent as participating in the labor market. Using this definition of labor force participation, we find that 68 percent of the rural men and 45 percent of the rural women in our sample, between the ages of 50 to 74, are in the labor force.

Among the other alternative answers to that question are "am retired" and "doing housework." The vast majority of rural elders who are not in the labor force describe themselves as doing housework. Only 5 percent of the male and 1 percent of the female elders who are not in the labor force describe themselves as retired. This is strong evidence that we need to move away from the mono-directional "work then retire" model of labor force participation often used in studies of older adults.

Table 1 shows the proportion of rural elders in the labor force by 5-year age cohorts, based on the above definition of labor force participation. We observe that labor force participation rates behave as we expected. Rates are much higher for younger cohorts than older cohorts and higher for men than for women at each age category. In addition, the unemployment rate is higher for men than women. Not shown in Table 1, women are much more likely than men to characterize themselves as doing housework. Seventy-four percent of the elder women who are not in the labor force characterize their work status as doing housework, compared to 57 percent of the elder men who are not in the labor force.

The data allow us to define employment (not labor force participation) in two alternative ways. In the first section of the survey, respondents were asked a set of time-use questions about their average hours per day spent in particular activities in the past week. The first activity listed was "working." We can define individuals as employed if they had positive hours of work in the previous week. We call this definition "daily hours employed" in order to distinguish it from "work status employed." "Daily hours employed" is also used by Giles, Wang and Cai (2011) based on the CHARLS data. Alternatively, we can define employment based on a set of questions on annual work hours in 2011. The questions are similar to those used by Pang, deBrauw and Rozelle (2004), in which employment is separated into farm and off-farm categories. Time spent in farming is collected separately for the busy and not-busy seasons. Months worked are recorded separately from average weekly hours. Off-farm time is also recorded separately for months worked and average weekly hours. We use these responses to calculate annual hours of work on and off farm. Employment can also be defined as positive

hours of either farm or off-farm work in the previous year. We refer to this definition as “annual hours employed.”

Table 2 compares “work status employed,” “daily hours employed,” and “annual hours employed.” Certainly, the proportion of elders recorded as employed is much higher at every age when we use the “daily hours employed” measure and/or the “annual hours employed” measure than our “work status employed” measure. Many of the respondents who report not being employed under the work status definition report significant numbers of annual or daily hours of work. Still the percent employed, using all three measures, decline with age and are lower for women than men. “Daily hours employed” and “annual hours employed” yield very similar results. The sample size is higher for annual hours employed because there are fewer missing values in the responses to the underlying questions. Unfortunately, the daily time-use variables suffer from substantial missing values.³

The definition of labor force participation used by Maurer-Fazio, Hughes, and Zhang (2010) and Connelly, Maurer-Fazio, and Zhang (2014) is based on yet another measure. Both these studies use the Chinese Population Census and define individuals as being in the labor force if they list an occupation in the question “What is your current occupation” or if they answer that the reason they are not employed is that they are looking for work. The levels of labor force participation based on the Census data are close to the “work status” labor force participation measure presented in Table 1. According to the 2000 Census, the average labor force participation rate for all rural residents, age 50 to 74, was 79 percent for men and 60 percent for women. However, when we limit our analysis of the Census data to the same counties that were sampled in the CHES, we find participation rates are 69 percent for men and 52 percent for women.⁴ The 2011 CHES data yields rates of are 68 percent and 45 percent for men and women, respectively.

Finally, we use hours worked, instead of dichotomized employment variables, to consider the process of gradual retirement as discussed in Giles, Wang and Cai (2011) and Pang, deBrauw and Rozelle (2004). Table 3 shows the number of daily hours reported as “work” and “housework” by age cohort and labor force participation status. Work hours differ substantially by work status defined labor force participation, which indicates that the work status labor force participation variable does contains useful information. We again observe that hours of employment decline with age. Controlling for labor force participation, hours of employment are very similar for men and women.

The fifth through eighth columns of Table 3 show hours of housework by labor force status and gender. Unlike work hours, housework hours do not differ by labor force status.

³ Only “hours worked” and “hours of housework” received responses from the majority of individuals. It may be that some enumerators did not record zero hours, treating the zero as a skip, while other enumerators did record zero hours. However, we do not feel comfortable assuming that all these missing time-use values are zero.

⁴ Thanks to Dandan Zhang for supplying us these CHES counties only statistics.

Women do about an hour a day more housework than men. Adding housework hours and work hours together, to proxy for what Burda, Hamermesh, and Weil (2013) call “total work,” we find that elder women who report their work status as in the labor force do the most work.⁵ But since women are less likely to be in the labor force than men, the last two columns of this table compare “total work” independent of labor force status. Here we find that at the younger age cohorts (of these elders), women continue to do more hours of “total work” than men, but at the older ages “total work” hours are reduced for both men and women and are more similar between men and women.

V: Labor Force Participation Patterns by Minority Status

Having familiarized ourselves with the CHES data on labor force participation and employment, we proceed with the analysis of cultural differences in labor force participation as defined by work status. Cultural differences will be characterized as differences across rural minority groups. We do this reassured that the work status defined labor force participation variable behaves in ways we would expect in terms of age and gender and is the most similar to the census measures that have been used for prior analyses of labor force participation by minority status.

Table 4 presents labor force participation rates by ethnicity and gender. There are quite substantial differences in labor force participation rates. Most of the minority ethnic groups of our study have rates above the Han for both men and women. The Tibetans and the Hui have rates below the Han for both men and women, with the gaps larger for women than men. The Uygurs show yet another pattern with rates higher than the Han for men, but lower than the Han for women.

Of course, these rates may differ because of economic and demographic differences among the groups. Following the work highlighted above by, Giles, Wang and Cai (2011), Pang, deBrauw and Rozelle (2004) and Connelly, Maurer-Fazio and Zhang (2014), we consider the effects of health, wealth, migration, and coresidence with adult children on labor force participation rates of China’s rural elders. We are interested in whether cultural differences remain after controlling for these determining factors.⁶

Tables 5 and 6 show mean values by ethnicity in some of the key variables we include in the multivariate analysis that follows. The average levels of education, proportion of households with out migrants, and rates of coresidency with adult children differ substantially by minority group. Average age, levels of disability, and proportion of prime-age adults engaged in off-farm employment in one’s county of residence are quite similar across minority groups. Table 6 also

⁵ Note that this analysis excludes child care hours of which women do more than men. But as discussed in text, not enough people answered the child care hours question to include it here.

⁶ Giles, Wang and Cai (2011), Pang, deBrauw and Rozelle (2004) analyze employment not labor force participation. However, given the very low rates of unemployment among rural elders, there is little difference between employment and labor force participation.

shows the sample sizes available in the CHES by ethnicity. Close to half of the sample is female for each ethnic group.

Figure 1 shows that the pattern of labor force participation by age differs substantially by ethnicity. Most groups start out with participation rates above the Han but their participation declines more rapidly by age. Tibetan men have the highest initial levels of participation while their participation declines more slowly with age than the Han's. For women, the declines are most noticeable from age 55 to 64, while for men the declines are most noticeable from age 60 to 69. In the multivariate model of the following section, we allow for differences in the effect of age by ethnicity. Although this complicates the model, it allows for an important source of cultural difference across ethnicities-- cultural differences in how age is viewed with respect to labor force participation.

VI: Multivariate Analysis of Labor Force Participation

The full regression model results are presented in Appendix Table A-1. Here we discuss the highlights.

VI.A: Living Arrangements and Demands for the Elder's Labor in Agriculture

Variables included in the model to capture the multidimensional issues surrounding living arrangements include a variable which indicates that an elder is living with his or her adult children, the residual between the coresidence variable and the predicted probability of coresidency,⁷ whether the elder is a widow or widower, whether the elder's household includes a member who is currently away from the village as a migrant, and two village-level variables: the average off-farm labor force participation of prime-age workers in the village, and the number of out-migrants in the village (as reported by a village official).

We find that coresidency is independent of labor force participation for men, but has a large statistically significant (at the 10% level) negative effect on women. The gender difference in the response to coresidency is quite robust to slight changes in the model specification. The differences may be because coresidency is associated with more housework/child care responsibilities for women than men.

Widowhood has a negative effect on both men and women, reducing the probability of labor force participation by 16 percentage points for men and 10 percentage points for women. Since age, self-reported health, and coresidence are controlled, it appears that widowhood itself brings with it an expectation that it is time to "stop working." Note, we put "stop working" in

⁷ Including the residual follows the Two-Stage Residual Inclusion (2SRI) method of Terza, Basu, and Rathouz (2008) as a means of controlling for the potential endogeneity of the coresidency decision. The 2SRI method produces consistent estimates and is easy to interpret. The marginal effect of the coresidency indicator can be thought of as the exogeneous effect of coresidency on labor force participation and the marginal effect of the residual can be thought of as the correlation between the unobserved factors leading to coresidency and labor force participation.

quotes, since our analysis of hours worked, above, shows that almost all elders report hours of agricultural work and housework. Widowhood does not have a significant effect on the probability of having positive annual hours of either off-farm work or farm work for men, but it is a significant negative predictor of farm work for women (results not shown here). Similarly, coresidence is not a significant predictor of farm or off-farm employment for either men or women.

We are somewhat surprised that having an out-migrant still listed in one's household register does not have an effect on labor force participation for either men or women. However, in many of these elder households it is the grandchildren not the adult children who are the migrants. It seems that grandchildren and elders are not substitutes for one another in rural employment.

Neither of the two village-level variables, the number of migrants from the village and the share of the prime-age population employed off-farm have an effect on men's or women's labor force participation. However, the effect of the share of off-farm village employment is significantly affects the probability that male and female elders participate in off-farm employment (results not shown).

VI.B: Income and Wealth Measures

Education matters for both men and women; the higher the level of education, the higher the probability that elders define themselves as in the labor force. The effect of low education is consistent over the many ways we measure employment and labor force participation. Not having attended primary school has a significant negative effect on men's farm and off-farm employment and also on women's farm employment. It also significantly reduces annual hours worked on and off the farm for men and on the farm for women. The strong negative gradient of education is surprising, given that we originally thought of education as correlated with wealth and predicted that those with more wealth would reduce their labor supply. It may be that education is measuring the opportunity cost of employment (a positive substitution effect). Or education may be associated with wealth, but the effect of wealth is that wealthier farmers have more capital goods to work with (which may reduce the physical effort of farming), have more land to farm, and have more opportunities for side businesses (all of which would lead to increased labor supply). As Table 5 reveals, education differs substantially across ethnic groups; however, these results come from an analysis that controls for ethnic group membership. The results on education are quite robust to changes in the model specification.

The other income and wealth measures provide mixed results. We find that the availability of a pension has no impact on men or women's labor force participation. Giles, Wang and Cai (2011) found that rural men's pensions had a negative effect on both rural men's and women's labor force participation, but recall that the CHARLS sample is limited to two provinces. The two household-level variables included are food expenditure per capita, which is

a good measure of general standard of living, and house value. House value has a small positive effect on labor force participation for both men and women, and food expenditure per capita has a significant negative effect for women. Giles, Wang and Cai (2011) found a negative effect of house value on women's employment while Pang, deBrauw and Rozelle (2004) found no effect of per capita income on employment in either farm or off farm.

Average village-level income per capita is found to have a significant negative effect for men, but again the effect is small. Looking at the annual-hours-employed model (results not shown), both men and women who live in higher-income villages report more farm hours. This means that male elders in higher income villages are less likely to identify their work status as employed, but still report higher hours of farm work. Just as we argue with regard to the results on education and coresidency, these wealth variables may tell us more about the availability of tasks than the choice to engage in these tasks.

VI.C: Health

The results in Appendix Table A-1 show that age is an important determinant of labor force participation for both men and women, but for men the decline in participation begins later at age 65 to 69, while for women it begins at in the 55 to 59 age range. This differential is evidence of the cultural aspects of age -- seeing oneself as employed.

Looking at the hours of work models (results not shown) for men, off-farm hours begin to decline for the 55 to 59 age cohort, but hours of farm work do not begin to decline until 65 to 70 where the drop is quite large, 227 annual hours fewer than for men age 50 to 54. For women, the decline in hours begins at 55 to 59 for off-farm work and at 60 to 64 for farm work. Women, age 60 to 64, report 172 fewer annual farm work hours per year compared to those age 50 to 54.

Having a self-reported disability that affects daily living is a strong negative predictor of labor force participation for both men and women with a much larger effect on men. Women who report having physical or psychological difficulty with tasks in the previous month also have lower labor force participation. For men the effect of this variable is smaller and more imprecisely measured. It is significantly negative in the annual hours of farm work model for both men and women and there has an equally large effect as disability on hours.

VI.D: Minority Group Membership

In the full model with interaction terms presented in Appendix Table A-1, ethnic minority status appears in three different places. The model allows us to look at the direct effect of ethnicity and the indirect effect through differences in the age gradient of hours decline. Based on our analysis of the raw data, we include interactions of ethnic group with the both 55 to 59 age cohort and the 60 to 64 age cohort for women and both the 60 to 64 and the 65 to 69 age cohort for men. These appear to be the key moments of decision making for women and men, respectively.

Recall that Table 4 reveals substantial differences in average labor force participation rates by ethnicity and gender. However, it is possible that some of the observed differences are the results of the very different demographic profiles and economic circumstances of the various minority groups. Members of different minority groups live in different parts of the country, farm land of different fertility, and are more or less likely to coreside with their adult children. However, the results of the multivariate analysis presented in Appendix Table A-1 show that substantial differences in labor force participation patterns exist among ethnic groups even after controlling for all of the variables already discussed. Most of the differences in minority labor force participation rates appear in the direct effect of ethnicity on labor force participation. We also find some differences by ethnicity in the age gradient decline in labor force participation, especially for men.

Table 7 presents the overall effect of both the direct and indirect pathways by which our model allows ethnic status to affect labor force participation. The numerical values are estimated marginal effects in comparison to the Han majority. For example, everything else held constant, Mongolian female elders are 17 percentage points more likely to identify themselves as being in the labor force than Han female elders. The Miao, Yao, and Tujia elder women have even higher rates of labor force participation--the Tujia women's participation rate is 27 percentage points higher than the Han's. Zhuang and Dong women's participation are also higher than the Han's by about 10 percentage points. Two groups have lower rates of elder women's labor force participation than the Han: the Hui and the Tibetans.

The unconditional marginal effects for men reported in Table 7 paint a similar picture to that of the women except for the Uygurs. As revealed in the raw data of Table 4, the Uygurs are distinct from the other groups in that their women's labor force participation rate is substantially lower than Han women's, while their men's participation rate is higher than the Han's. Table 7 confirms that this effect remains even after controlling for many of the other factors that affect labor force participation. In all, seven of the nine ethnic minority groups have labor force participation rates for male elders significantly higher than that of the Han. The Hui and the Tibetans' rates appear to be lower than the Han's, but are estimated imprecisely.

Mostly the ethnic minority differentials are larger for the women than the men. The Tujia have the highest rates of participation for both men and women. Not all the participation differentials translate to significant differences in annual hours worked. For men, the Hui have significantly lower annual hours worked and the Uygur, Miao, and Tujia have significantly higher annual hours worked. For women, the Hui have significantly lower hours worked and the Miao have significantly higher (results not shown).⁸

⁸ These results come from multivariate models similar in specification to the one presented in Appendix Table A-1 except without age/minority interactions. Annual hours of work has more missing values than work status leading to sample sizes that are not sufficient for stability of the age-interacted model. The qualitative results reported in Table 7 remain in the LFP model estimated without age/minority interactions.

Most of the effect of ethnicity status for women occurs in the direct effect. In terms of the indirect age interaction effects, the Hui women age 55 to 59 have significantly lower rates and the Tujia women age 55 to 59 have significantly higher rates of labor force participation than the Han women of the same age. In the 60 to 64 age range only the Tibetans show a significantly steeper decline than the Han women. For men the age/minority interactions are more important. Mongolians, Hui, Uygurs, and Miao all have lower rates of labor force participation at age 60 to 64 than the Han reveals they have a much steeper age gradient the Han, given their participation rates at lower ages were higher than those of the Han. The Uygurs and the Dong have lower rates of labor force participation at age 65 to 69 than the Han. Cultural differences, thus, appear to affect how elders see themselves in terms of their work status and when they switch to regarding themselves as “keeping house.”

We apply a decomposition technique along with multivariate analysis to determine how much of the labor force participation gap between the minority groups and the Han is the result of differences in their socioeconomic attributes and how much is the result of direct and indirect cultural differences.⁹ The results of the decomposition exercise reveals that attribute differences alone would result in a Han rate of labor force participation higher than that of the ethnic minority groups’ rates for all groups for both men and women. Since most of the ethnic minority participation rates are, in fact, higher than the Han’s, we find that the cultural differences are entirely responsible for each of the situations where the ethnic group rates are higher than the Han’s. Likewise, the cultural differences are responsible for much of the gap for the Hui and Tibetan men and women and for Uygurs women all groups for whom the Han rates of labor force participation are higher than these minority groups.

VII: Conclusions

This paper has considered the time use of rural elders in the seven provinces included in the CHES data. The seven provinces were chosen to due to their substantial minority populations. The data is an ideal source for examining the effect of cultural differences on a key lifecycle event, the reduction of market-oriented work with age. Membership in an ethnic minority group is used as a proxy of potential differences in the culture of aging and caregiving.

We expected that demand for the elders’ labor, as proxied by households with out-migrants, the number of out-migrants from the village, and residence in a village with a higher share of prime-age off-farm labor, would affect labor force participation rates, but none of these variables matter in a statistically significant way. Coresidency is also thought to affect the demand for elders’ labor. Coresidency has a negative effect for women, but not for men. However, coresidency does not affect annual hours worked for men or women. This leads us to conclude that coresidency for some women changes their work -- away from market-oriented farm work towards domestic farm work. For men, it does not even appear to do this.

⁹ We employ the Borooah and Iyer (2005) technique as did Maurer-Fazio, Hughes, and Zhang (2010) for analyzing differences across multiple groups. Results available from authors.

Similarly, based on the expectation of a larger income effect than substitution effect, we expected labor force participation to decline with wealth for rural elders. For men, village income is negatively related to labor force participation. For women, household income is negatively related to labor force participation. Both of these effects are quite small. Education and house value affect labor force participation in the other direction; higher education and house values lead to higher rates of labor force participation for both men and women. We hypothesize higher wealth, as proxied by higher education and house value, leads to households having more labor saving farm equipment and more side businesses such that there are more tasks available that do not require as much strength and endurance.

Beyond education, the strongest predictors of labor force participation for rural Chinese elders are age, disability, widowhood, and minority status. Age and disability certainly reflect health limitations which can affect the ability to work. But age also appears to have a cultural component: the steepness of the age gradient differs between men and women and, for men especially, by minority status. Widowhood can also be thought of as having a cultural component, as it seems to be part of the definition of being “too old” to do commercial work. Widowhood reduces the probability of positive hours of farm work for women, but not men.

Finally, we find robust effects of minority status on labor force participation. For men, the Han are less likely to be in the labor force than men of most of the ethnic minority groups. For women, Hui and Tibetans are less likely to be in the labor force than the Han, but Mongolians, Miao, Zhuang, Dong, Yao and Tujia are more likely to be in the labor force. The difference between Tujia and Han is quite large for both men and women. Uygurs are unique among the minority groups in that being Uygur lowers the probability of labor force participation for women and raises it for men. A decomposition analysis showed that attribute differences predict higher rates of labor force participation for Han than for ethnic minority groups in each case. As such, all of the comparisons where minority group rates are higher than Han are solely the result of cultural differences.

Future work with the CHES data could consider other locations of decision making in rural China where culture, proxied by ethnic group membership, may play a role. It would also be interesting to see if similar culture differentials exist in the labor force participation of elder urban dwellers. Others have found that cultural differences are maintained, though dampened, for at least one generation following migration. (Blau, et al 2013; Alesina and Giuliano, 2007)

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Figure 1

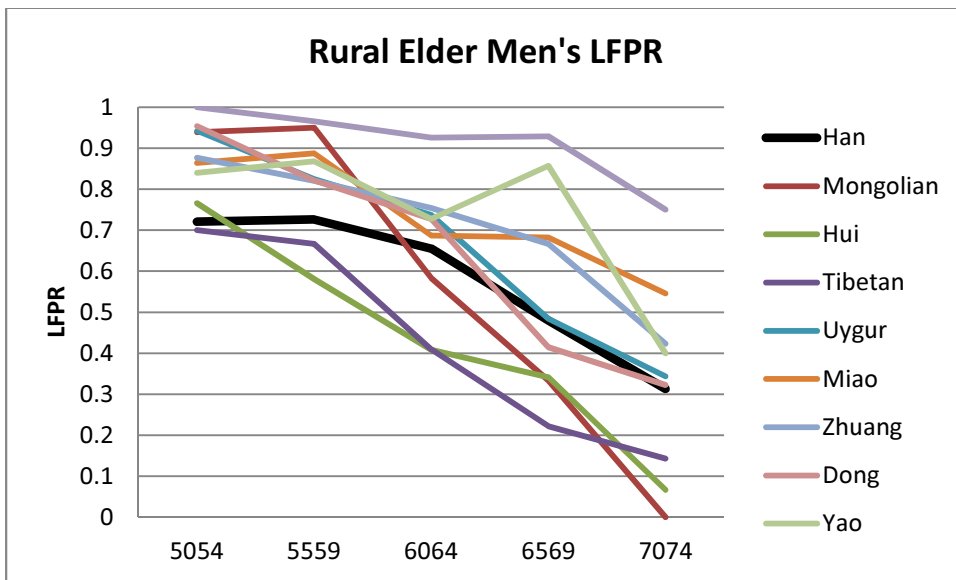
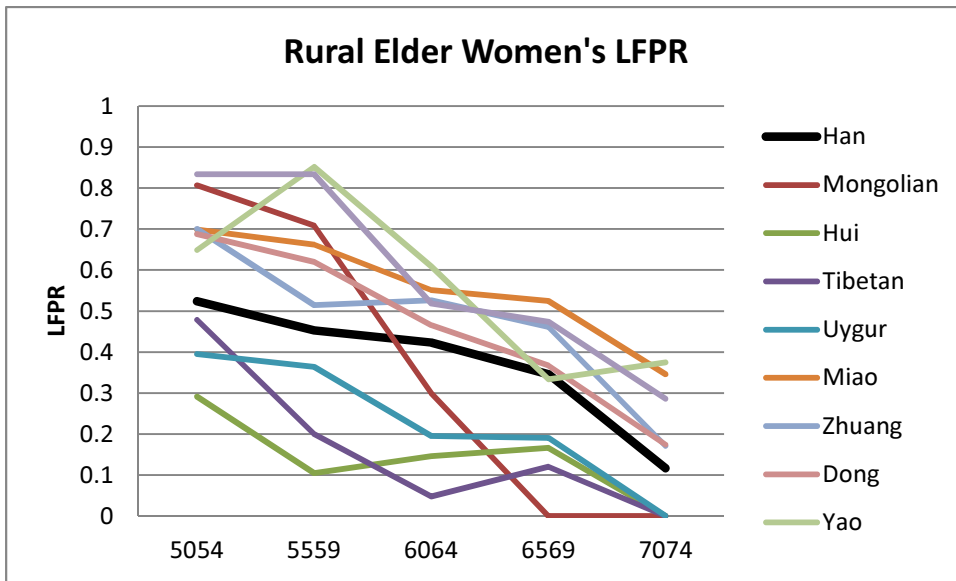


Table 1: Labor Force Participation Rate Based on Work Status During the Final Week of 2011

	Men	Women	Sample Size Men	Sample Size Women
50 to 54	79.6%	56.8%	862	829
55 to 59	76.8%	48.2%	1,054	1,022
60 to 64	66.1%	42.0%	817	691
65 to 69	51.6%	34.5%	483	414
70 to 74	35.0%	16.2%	314	284
All elders LFPR	67.9%	44.6%	3455	3160
Unemployment rate of those in labor force	4.0%	1.7%		

Table 2: Alternative Definitions of Employment

	Men			Women		
	Work Status Employed	Daily Hours Employed	Annual Hours Employed	Work Status Employed	Daily Hours Employed	Annual Hours Employed
All elders	65.2%	92.5%	89.9%	43.9%	87.8%	86.4%
50 to 54	76.5%	96.0%	93.9%	55.7%	95.2%	94.0%
55 to 59	73.9%	96.2%	93.9%	48.0%	92.4%	92.1%
60 to 64	63.2%	92.9%	89.6%	41.4%	86.5%	83.1%
65 to 69	49.9%	87.8%	84.0%	33.3%	78.3%	72.1%
70 to74	34.1%	68.5%	68.1%	15.5%	48.6%	52.5%
Total Sample Size	3530	2739	3289	3240	2317	2852

Table 3: Average Daily Hours Spent in "Work" and Housework in Rural China by Elders age 50-74

	Work				Housework				Work Plus Housework				Work Plus Housework	
	Men		Women		Men		Women		Men		Women		All Men	All Women
	Out of Labor Force	In Labor Force	Out of Labor Force	In Labor Force	Out of Labor Force	In Labor Force	Out of Labor Force	In Labor Force	Out of Labor Force	In Labor Force	Out of Labor Force	In Labor Force		
All elders	3.6	6.2	3.4	6.0	1.7	1.7	2.9	3.0	4.7	7.5	6.0	8.5	6.6	7.3
50 to 54	4.1	6.5	4.2	6.2	1.5	1.5	3.3	2.9	5.0	7.6	6.8	8.7	7.0	8.0
55 to 59	4.4	6.4	4.2	6.1	2.0	1.6	3.1	3.0	5.8	7.6	6.9	8.6	7.1	7.8
60 to 64	3.7	6.1	3.1	6.0	1.6	2.0	2.7	3.2	5.1	7.4	5.7	8.6	6.6	7.1
65 to 69	3.1	6.0	2.3	5.6	1.7	1.8	2.6	2.7	4.1	7.4	4.5	7.7	6.1	6.0
70 to 74	1.7	5.0	1.0	4.9	1.3	1.6	1.9	2.6	2.1	6.8	2.7	6.9	4.3	3.8

Table 4: Labor Force Participation Rates of Rural Elders, Age 50 to 74

	Men	Women
Han	64.8%	43.4%
Mongolian	81.7%	60.8%
Hui	50.2%	15.0%
Tibetan	47.7%	20.4%
Uygur	70.8%	28.7%
Miao	75.5%	58.3%
Zhuang	77.4%	52.1%
Dong	71.1%	51.0%
Yao	79.6%	63.3%
Tujia	94.3%	61.8%
Other	57.4%	31.3%

Table 5: Educational Attainment of Elders by Gender and Ethnicity (%)

	Men			Women		
	No Primary School	Primary School	Middle School and Above	No Primary School	Primary School	Middle School and Above
Han	12.8	39.2	48.0	37.7	42.3	20.0
Mongolian	2.9	28.6	68.6	13.7	45.2	41.1
Hui	48.7	32.5	18.9	80.8	17.8	1.4
Tibetan	31.7	55.8	12.5	69.6	29.4	1.1
Uygur	12.4	60.3	27.3	17.1	67.7	15.3
Miao	12.9	49.3	37.8	49.0	43.0	8.0
Zhuang	4.9	33.2	61.9	27.1	44.6	28.2
Dong	10.9	41.4	47.7	37.8	46.1	16.1
Yao	8.2	53.1	38.8	32.6	50.5	16.8
Tujia	2.3	50.0	47.7	25.3	62.1	12.6
Other	22.8	39.4	37.8	60.5	29.5	10.1

Table 6: Various Characteristics of Rural Elders (Age 50-74) by Ethnicity

	Average share of elder households with an out-migrant	Average share of elders who live with an adult child	Average share of employment off-farm of prime-age population, by county	Average Age	Average share of elders reporting disabled	Elders Sample Size
Han	41.4%	53.4%	19.1%	58.8	3.2%	2,769
Mongolian	34.5%	62.9%	14.1%	56.7	2.1%	145
Hui	47.6%	63.4%	20.4%	59.9	4.3%	443
Tibetan	27.3%	88.7%	22.3%	60.3	4.4%	205
Uygur	16.2%	86.1%	24.6%	59.8	3.9%	383
Miao	59.3%	63.1%	21.8%	60.9	2.1%	947
Zhuang	49.9%	70.0%	11.8%	58.9	1.8%	567
Dong	55.4%	62.6%	27.1%	60.3	1.9%	527
Yao	61.3%	66.0%	25.9%	59.1	0.9%	217
Tujia	52.5%	58.1%	17.7%	60.6	0.6%	177
Other	64.6%	60.0%	16.5%	59.5	2.3%	260

Table 7: Marginal Effects (Unconditional) of Minority Group Membership on Labor Force Participation

	Women		Men	
Mongolian	0.1728	**	0.1218	*
Hui	-0.1991	***	-0.0797	
Tibetan	-0.1265	**	-0.0652	
Uygur	-0.0628		0.1544	***
Miao	0.2024	***	0.1512	***
Zhuang	0.1159	*	0.1203	**
Dong	0.1146	**	0.0811	**
Yao	0.2263	***	0.1457	*
Tujia	0.2687	***	0.3001	***
Other	-0.0763		-0.0806	

Appendix Table A-1: Determinants of Labor Force Participation of Rural Elders

	(1)	(2)	(3)	(4)
	Women		Men	
	Marginal effect (robust z statistic)	Mean	Marginal effect (robust z statistic)	Mean
Coreside with adult child	-0.250* (1.70)	0.631	0.083 (0.56)	0.602
Coresiding residual	0.189 (1.24)	-0.001	-0.092 (0.62)	-0.003
Widow or widower	-0.100* (1.90)	0.147	-0.157*** (3.59)	0.100
Household includes outmigrant	-0.001 (0.04)	0.437	0.029 (0.90)	0.454
% of prime age villagers employed off farm	0.077 (0.55)	0.199	0.174 (1.62)	0.202
Number of migrants From village (hundreds)	0.006 (1.40)	4.877	0.008 (1.41)	4.884
Did not attend primary school	-0.087*** (3.01)	0.412	-0.103*** (3.40)	0.148
Attended middle school or beyond	0.104*** (2.92)	0.164	0.051** (2.26)	0.425
Elder receives pension	0.040 (1.11)	0.253	-0.020 (0.64)	0.270
Food expenditure per capita (thousands of yuan)	-0.023* (1.66)	2.119	0.021 (1.56)	2.145
House value (thousands of yuan)	0.001*** (3.11)	49.768	0.001** (2.13)	49.909
Average village income (thousands of yuan)	-0.013 (1.54)	4.260	-0.016** (2.23)	4.243
Aged 55 to 59	-0.074* (1.91)	0.315	-0.030 (1.07)	0.285
Aged 60 to 64	-0.099** (2.07)	0.215	-0.044 (1.03)	0.241
Aged 65 to 69	-0.156*** (3.71)	0.131	-0.224*** (4.43)	0.142
Aged 70 to 74	-0.309*** (6.27)	0.087	-0.462*** (9.11)	0.091
Disabled	-0.120* (1.70)	0.033	-0.384*** (4.94)	0.023
Difficulty with daily tasks	-0.115** (2.26)	0.053	-0.044 (0.87)	0.042

Mongolian	0.220** (2.18)	0.024	0.223*** (3.33)	0.022
Hui	-0.140* (1.94)	0.068	-0.040 (0.61)	0.067
Tibetan	-0.024 (0.26)	0.030	0.010 (0.14)	0.031
Uygur	-0.076 (0.86)	0.052	0.208*** (4.83)	0.059
Miao	0.246*** (3.94)	0.146	0.212*** (4.89)	0.147
Zhuang	0.135* (1.67)	0.087	0.131** (2.29)	0.078
Dong	0.116 (1.50)	0.084	0.135*** (2.86)	0.082
Yao	0.174 (1.36)	0.030	0.167* (1.81)	0.030
Tujia	0.227** (2.03)	0.027	0.268*** (3.56)	0.026
Other minority	-0.173** (2.12)	0.041	-0.109 (1.15)	0.037
Mongolian * 55 to 59	0.130 (0.82)	0.008		
Hui * 55 to 59	-0.243** (2.30)	0.020		
Tibetan* 55 to 59	-0.151 (1.19)	0.007		
Uygur* 55 to 59	0.099 (0.93)	0.017		
Miao* 55 to 59	-0.005 (0.07)	0.043		
Zhuang* 55 to 59	-0.056 (0.59)	0.030		
Dong * 55 to 59	0.053 (0.56)	0.026		
Yao* 55 to 59	0.282 (1.42)	0.007		
Tujia* 55 to 59	0.374*** (2.69)	0.005		
Other minority * 55 to 59	0.005 (0.04)	0.018		
Mongolian * 60 to 64	-0.255 (1.40)	0.003	-0.373** (2.19)	0.004
Hui* 60 to 64	-0.106 (0.94)	0.016	-0.158* (1.69)	0.014
Tibetan* 60 to 64	-0.321* (1.85)	0.007	-0.198* (1.83)	0.007
Uygur* 60 to 64	-0.136	0.013	-0.169*	0.017

	(1.19)		(1.84)	
Miao* 60 to 64	-0.091	0.035	-0.246***	0.035
	(1.26)		(3.37)	
Zhuang* 60 to 64	0.056	0.011	-0.040	0.018
	(0.39)		(0.38)	
Dong* 60 to 64	-0.027	0.018	-0.108	0.020
	(0.26)		(1.17)	
Yao* 60 to 64	-0.013	0.007	-0.219	0.011
	(0.07)		(1.47)	
Tujia* 60 to 64	-0.096	0.008	0.003	0.008
	(0.68)		(0.01)	
Other minority * 60 to 64	0.360**	0.007	-0.073	0.007
	(2.39)		(0.47)	
Mongolian * 65 to 69			-0.410	0.001
			(1.40)	
Hui* 65 to 69			-0.019	0.014
			(0.20)	
Tibetan* 65 to 69			-0.215	0.006
			(1.53)	
Uygur* 65 to 69			-0.251**	0.008
			(2.18)	
Miao* 65 to 69			-0.087	0.027
			(1.11)	
Zhuang* 65 to 69			-0.011	0.007
			(0.08)	
Dong* 65 to 69			-0.230**	0.013
			(2.43)	
Yao* 65 to 69			0.109	0.002
			(0.61)	
Tujia* 65 to 69			0.073	0.004
			(0.38)	
Other minority * 65 to 69			0.196*	0.004
			(1.78)	
Observations	2958		3141	

Robust z statistics in parentheses

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