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LIKE PARENTS, LIKE CHILDREN? INTERGENERATIONAL POVERTY TRANSMISSION IN
CHINA

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Abstract

This study examines the effects of a father and mother's human and social capital on the income of their children (progeny) in China using the 2014 China Labor-force Dynamics Survey. The results indicate that: 1) the effects of the human and social capital of the father and mother on the progeny's income are heterogeneous. Specifically, the father's education, the nature of father's household registration (*hukou*), and the nature of the mother's household registration have little effect on their progeny's income. However, the mother's education has a positive and significant effect on progeny's income. 2) The effect of the mother's education on her progeny's income, although significant, is limited, and on average the marginal contribution of the mother's education on the natural logarithm of the progeny's income is only 1.1%. 3) The progeny's own human capital, such as health, education, foreign language ability, and professional ability, significantly affects his or her income. 4) The results obtained from quantile regression and sub-sample regression with different age cohorts support the above findings. Therefore, the effective means of intervening against the intergenerational transmission of poverty should be to help the progeny improve their human capital, rather than starting with their parents.

Keywords: human capital; social capital; intergenerational transmission of poverty; individual destiny

JEL classification: I25; J18; O15; Q01

LIKE PARENTS, LIKE CHILDREN? INTERGENERATIONAL POVERTY TRANSMISSION IN CHINA

1. Introduction

The objective of this study is to understand the factors affecting intergenerational poverty transmission in China using a quantile regression model. For this purpose, we use nationwide China Labor-force Dynamics Survey data collected in 2014 by the social science research center of Sun Yat-sen University in China.

The intergenerational transmission of poverty^① is an oft-studied topic in the study of anti-poverty; it is the process by which poor parents transmit their poverty and various unfavorable characteristics related to poverty to their children (Bird, 2007), hereafter referred to as progeny. This concept was first studied in long-term in impoverished communities of the United States in the 1960s (Willie, 1969). The intergenerational transmission of poverty has been widely studied by anti-poverty researchers and anti-poverty practitioners due to its association with chronic poverty, social structure, social class solidification, and social mobility (Gatzke-Kopp & Creavey, 2017; Papanastasiou & Papatheodorou, 2017; Comim, 2018; Duarte, 2018).

As the largest developing country in the world, poverty alleviation an important issue, and elimination of the intergenerational transmission of poverty is a crucial part of China's sustainable development (SCC, 2014). The Chinese government has implemented multipronged policies to reduce the intergenerational transmission of poverty, such as social support and free vocational education to improve the growth environment for children of poor families, yet poverty remains a persistent problem despite these programs (Li et al., 2014). In the process of intergenerational transmission of poverty, the role of parental human and social capital is very important. To a large extent, these two sources of capital determine whether one's children will be trapped in

^① Another term signifying a similar meaning in the economics literature is intergenerational earnings mobility. Please see related papers on this topic by Solon (2002), Bratsberg et al. (2007), Piraino (2015) and multiple papers published on the topic in the July 2018 issue of the *Economics Journal* (web address: see <https://academic.oup.com/ej/issue/128/612>).

poverty or not ([Corcoran, 1995](#); [Rodgers, 1995](#); [Corcoran, 2001](#); [Airio et al., 2005](#); [Gibbons and Blanden, 2006](#)).

Based on previous studies, we limit the definition of “parents” to father and mother and consider each separately to explore the influence of each parent’s human and social capital on their children’s income. We then explore the heterogeneity of parental capital on progeny income. By disaggregating parental capital to human and social capital, this paper contributes on two fronts: it reexamines the theory of the intergenerational transmission of poverty through empirical models; second, in practice, it helps to design an effective policy to prevent the intergenerational transmission of poverty.

Previous studies have primarily focused on two issues regarding the intergenerational transmission of poverty. The first is to verify the existence of the intergenerational transmission of poverty. Numerous studies have shown that the status of the parents is easily transmitted to the younger generation, that is, the rich are always rich and the poor are always poor. [Rodgers \(1995\)](#) uses a dynamic panel data from 1968-1988 in the U.S. to find that 16%-28% of children who have poor parents remain poor as adults. Other studies find evidence of intergenerational poverty among African-Americans ([Corcoran, 2001](#)), in Finland ([Airio et al., 2005](#)), and in Great Britain ([Gibbons and Blanden, 2006](#)). In China, [Lin and Zhang \(2012\)](#) and [Zhang \(2013\)](#) find that parents and children of poor families have a significant correlation in marital status, years of education, income level, employment opportunities, and medical insurance. Parents and children from poor families are at an obvious disadvantage in terms of all of these.

Other studies have drawn different conclusions. [Becker and Tomes \(1986\)](#) find that the wealth status of family ancestors almost entirely dissipates within three generations. [Adermon et al. \(2016\)](#) find that the wealth correlation coefficient of grandparent-grandchild is just 0.1–0.2. In a prospective 30 years study, [Najman et al. \(2018\)](#) find that only a very small minority of families experienced persistent poverty over the 30-year duration. In China, [Lu & Pan \(2016\)](#) and [Guo & Zhou \(2017\)](#) both find that the probability of intergenerational transmission of poverty is decreasing over time. These two studies show only modest intergenerational transmission of poverty within

China.

Preventing the intergenerational transmission of poverty is the second issue discussed recently. Researchers put forward strategies to overcome the intergenerational transmission of poverty from both the perspective of parents and children (Zhu, 2016; Bird & Higgins, 2011; Li et al., 2014). From the parents' perspective, Zhu (2016) promotes the development of parents' education in poor families to alleviate the intergenerational transmission of poverty by analyzing the transmission of parents' education and occupation to their children.

Other studies suggest that preventing the intergenerational transmission of poverty from parents is ineffective. Behrman et al. (2017) find that an increase in education greatly reduces the poverty and inequality of parents, but there is little to reduce poverty and inequality in the children's generation. From the children's perspective, some studies suggest that in order to get the children of low-income families out of poverty, society needs to create more conditions and space for the children of low-income families to improve their personal ability (Bird & Higgins, 2011; Li et al., 2014).

Throughout China's history, the importance of household registration (in China, named *hukou*^②) is self-evident. In the era of a planned economy, the nature of the household registration is closely related to the free migration of the population and the quota supply of production and consumption products. In the era of China's reform and opening, which began in 1978, the nature of the household registration is closely related to individual welfare, such as employment, education, housing, medical care, and social security. To a large extent, the nature of household registration is closely related to the rights of individuals in social distribution and is an extremely important social capital (Lu, 2008; Wan, 2013; Wang, 2014). For this reason, household registration system reform is an important task for China. This paper will explore the significance and heterogeneity of the level of education and household registration of fathers and mothers on progeny's income.

^② *Hukou* is a system of household registration in Chinese mainland and Taiwan and has origins in ancient China. It officially identifies a person as a resident of an area and includes identifying information such as name, date of birth, parents, and spouse.

The existing studies are significant for understanding the intergenerational transmission of poverty, but there remains room for further research. First, the current studies bundle parents as a concept of identity. For example, measuring the educational level of fathers and mothers by the mean of their parents' educational level, or measuring the income of fathers and mothers by the parents' average income (Lin and Zhang, 2012). This treatment ignores the heterogeneity of father and mother in the outcome of their progeny. We divide the concept of "parents" to explore the separate influence of the father and mother's capital on their progeny's income. Previous recommended countermeasures to prevent the intergenerational transmission of poverty have also relied on bundled parental characteristics, which may lead to inaccurate recommendations and wasted resources. To make up for the above shortcomings, we will separately put forward policy implications for fathers and mothers to prevent the intergenerational transmission of poverty.

The remainder of this paper is organized as follows: in section 2, we provide the theoretical model for this paper. In section 3, we provide the econometric model used in the paper. In section 4, we provide details related to data and variables used in the model. In section 5, we present results from econometric models estimated in the paper, including an alternative model estimation for robustness check. The final part provides the conclusion and discussion of this study.

2. Conceptual Framework

There are three major explanations given on how different forms of parental capital affect their progeny's income and intergenerational poverty (Stenberg, 2000). The first explanation holds that intergenerational transmission is a basic feature of poverty culture (Harrington, 1962). A strong nuclear family has strong interdependence and trust among its family members. It enables the younger generation to inherit the values, attitudes, and customs of the older generation. Of course, this also includes inheriting poverty (Lewis, 1968; Macaulay, 1977).

The second explanation is related to social policy (Stenberg, 2000). The

intergenerational transmission of welfare dependence is particularly emphasized in this explanation. Welfare-dependent families fall into the poverty trap because long-term welfare benefits have changed the values of family members, and these values, which are prone to welfare dependence and poverty, can be passed on from generation to generation (Mead, 1992).

The third explanation emphasizes the influence of economic structural factors on the intergenerational transmission of poverty, in which human capital and social capital play key roles (Stenberg, 2000). Parental human capital can affect their investment in their children's human capital, which in turn affects their children's human capital. The less human capital parents have, the more likely they are to invest less in their children's human capital. This leads to less human capital for children and difficulties in finding good jobs, thus plunging them into poverty. Meanwhile, parental social capital has an important impact on their children's poverty. Parents lack social capital, which makes it difficult to develop social networks for their children's development (Becker & Tomes, 1986).

Becker and Tomes (1986) develop a model of the transmission of earnings, assets, and consumption from parents to progenies. Their model assumes utility-maximizing parents who are concerned about the welfare of their children. The degree of intergenerational mobility is determined by the interaction of this utility-maximizing behavior with investment and consumption opportunities in different generations and with different kinds of luck. The amount of capital owned by the parents has a significant influence on the children's future.

Assume for simplicity that family i contains one parent of generation $t-1$ and one child of generation t . The family must allocate the parent's lifetime after-tax earnings $(1 - \tau)y_{i,t-1}$ between the parent's own consumption $C_{i,t-1}$ and investment $I_{i,t-1}$ in the child's human capital. The resulting budget constraint,

$$(1 - \tau)y_{i,t-1} = C_{i,t-1} + I_{i,t-1},$$

assumes that the parent cannot borrow against the child's prospective earnings and does not bequeath financial assets to the child. See Becker and Tomes (1986) for an analysis that relaxes this assumption. Given the simplifying assumption of proportional taxation

at rate τ , redistributive government policy will be represented in this analysis solely by progressive public investment in children's human capital.

The technology translating the investment $I_{i,t-1}$ into the child's human capital h_{it} is

$$h_{i,t} = \theta \log(I_{i,t-1} + G_{i,t-1}) + e_{it},$$

where $G_{i,t-1}$ is the government's investment in the child's human capital (for example, through public provision of education or health care), $\theta > 0$ represents a positive marginal product for human capital investment, the semi-log functional form imposes decreasing marginal product, and e_{it} denotes the human capital endowment the child receives regardless of the investment choices of the family and government. This endowment represents the combined effect of many child attributes influenced by nature, nurture, or both.

According to [Becker and Tomes \(1979\)](#), children's endowed attributes "... are determined by the reputation and 'connections' of their families, the contribution to the ability, race, and other characteristics of children from the genetic constitutions of their families, and the learning, skills, goals, and other 'family commodities' acquired through belonging to a particular family culture. Obviously, endowments depend on many characteristics of parents, grandparents, and other family members and may also be culturally influenced by other families."

With this characterization of the sources of the endowment, it is natural to assume that the child's endowment is $e_{it} = \delta + \lambda e_{i,t-1} + v_{it}$,

Where v_{it} is a white-noise error term and the heritability coefficient λ lies between 0 and 1.

Finally, the child's income $\log y_{it} = \mu + p b_{it}$,

Where p is the return to human capital. Following [Juhn et al. \(1993\)](#), we will characterize an era of greater earnings inequality as an era of higher p . This era need not exhibit higher levels of earnings because the higher p might be accompanied by a lower μ .

The empirical part of this paper will focus on the third explanation, viz., the influence of human capital and social capital of the parents related to economic and

social structure on the income of their offspring.

3. Method

3.1 Baseline regression model

This paper constructs the following regression equations to focus on the impact of the father and mother's human capital and social capital endowments on progeny income:

$$y = \alpha_0 + \alpha_1 CF + \alpha_2 SF + \alpha_3 CM + \alpha_4 SM + \beta_I X_I + \varepsilon \quad (1)$$

In equation (1), y is the natural logarithm of progeny income, α_0 is the intercept term, CF is the father's years of education, SF is the household registration of the father, CM is the mother's years of education, SM is the household registration of the mother, and X_I is the vector of control variables that may affect progeny income. α_1 , α_2 , α_3 , α_4 , β_I represent the effect of the father's level of education, the father's household registration, the mother's level of education, the mother's household registration, and other control variables on the income of the children.

3.2 Quantile regression model

We also construct a quantile regression model to explore the effects of parental capital on children's income at different income levels. The functional form of the quantile regression model used is as follows:

$$y_i = x_i' \beta_\theta + \mu_{\theta_i} \quad quant_\theta(y_i|x_i) = x_i' \beta_\theta \quad (i = 1, \dots, n) \quad (2)$$

In equation (2), β_θ and x_i are both $K \times 1$ vectors, and $x_{i1}=1$, $quant_\theta(y|x)$ represents the conditional quantile function of y with a quantile of θ under the condition of given x (Koenker & Bassett, 1978). The quantile regression model can estimate the entire conditional distribution of y at a given x . We analyze the effects of independent variables on progeny income at every five percentiles but show results only for the 0.1,

0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, and 0.9 percentiles.

4. Data, Variables, and Descriptive Statistics

4.1 Data sources

We use data from the China Labor-force Dynamics Survey 2014 (CLDS2014), conducted by the social science research center of Sun Yat-sen University in China. CLDS2014 is an interdisciplinary survey, covering many research topics, such as education, work, migration, health, social participation, economic activities, and grass-roots organizations. To ensure national representativeness, CLDS's samples cover 29 provincial administrative units, except for Hong Kong, Macao, Taiwan, Tibet, and Hainan (Figure 1). In the sampling method, the multistage cluster, stratified, probability proportion to size sampling method is used. Therefore, this dataset is very representative of China. It is public data that all researchers can use by visiting <http://css.sysu.edu.cn>. The survey was conducted by Computer Assisted Personal Interviewing (CAPI) technology.

<FIGURE 1 APPROXIMATELY HERE>

After removing respondents with missing and outlier values, the final dataset in this paper is comprised of 11,445 observations.

4.2 Variable selection and justifications

The dependent variable of interest is progeny income, measured by total personal income in 2013, including agricultural income, wages, and business income. The individual total income reflects the individual's economic revenue ability, which is an important index to measure the individual's economic and poverty status.

Parental capital represents the primary set of independent variables of interest in this paper, specifically the influence of the father and mother's human capital and social capital on progeny income. Human capital is measured by years of schooling, and social capital is characterized by household registration at birth. The theory of human capital holds that education is an important way to both gain and measure human capital (Schultz, 1971 & 1993), and we explained the importance of household registration in China in the introduction section.

Beyond these parental variables, five categories of control variables of their progeny are included. These five categories of the progeny are human capital, social capital, demographic characteristics, employment environment, and location (Rodgers, 1995; Corcoran, 2001; Airio et al., 2005; Gibbons & Blanden, 2006; Lin & Zhang, 2012; Zhang, 2013).

The human capital variables include the progeny's health, level of education, foreign language knowledge, and attainment of occupational qualification certifications. The health of progeny is represented by three indicator variables, fair health, good health, and best health, with poor health as the baseline group. The education of progeny refers to the number of years of received school education. Foreign Language and Occupational Qualification Certificates are indicator variables; the baseline group has neither of these respective skills.

The social capital variables of the progeny include agricultural household registration, party, and the number of closer acquaintances known by the progeny. Agricultural household registration and Party are indicators controlling for whether the progeny has agricultural household registration at birth and whether they are a member of the Communist Party of China. The number of closer acquaintances of progeny refers to the number of closer acquaintances known by the progeny.

The employment environment variable includes the work industry of the progeny. The work industry of progeny is a virtual variable with two categories, viz., agricultural industry or non-agricultural industry, and the agricultural industry is the baseline group.

To control for potential regional differences, two indicators are included for the responses from the Central and Eastern regions of China, with the Western region as

the baseline group (Table 1). The western region is generally considered a poor region of China.

In addition to above variables, we also include demographic variables such as gender, age, and age squared of progeny in regression models.

4.3 Descriptive statistics

Descriptive statistics of variables are reported in Table 1. Mean progeny income in 2013 is 33779.89 yuan^③. Among the independent variables, the father's educational attainment is 5.09 years, and the mother's educational attainment is significantly lower at 3.60 years. The proportion of fathers with non-agricultural household registration is 14%, and the proportion of mothers is 13%.

In the sample, males account for 55%, and females account for 45% of total progenies. The average age of progenies is 46.35 years old. The mean school educational attainment of progenies is 8.96 years. Progenies who understand foreign languages are 13%, and 16% have occupational qualification certificates. The proportion of progenies with non-agricultural household registration at birth is 17%. Progeny who are the members of Communist Party of China are 10%. The average number of acquaintances of progenies is 14.27. The share of progenies working in the non-agricultural industry accounts for 57% (Table 1).

<TABLE 1 APPROXIMATELY HERE>

5. Results

5.1 Benchmark regression results

Table 2 reports the results of regression using equation (1). Column (1) contains four explanatory variables – father's education, father's household registration, mother's

^③ 1 Chinese Yuan = US \$0.15 (As of February 11, 2019)

education, and mother's household registration. Column (2) adds other progeny's control variables. While column (1) shows the significant effect of father's education, father's registration, mother's education, and mother's household registration on progeny's income, only mother's education remains significant after other control variables are included, as shown in column (2). The marginal contribution of the mother's education to the income of progeny is 1.1%, i.e., if the mother's education increases one year, the natural logarithm of income of progeny will increase by 1.1%. It can be considered that the marginal contribution of mother's education to progeny's income is low but statistically significant.

From the above results, two conclusions can be drawn. First, the effect of each parent's education and household registration affect progeny income differently. This is contrary to the research conclusions of [Lu and Pan \(2016\)](#), who show that parents almost have the same effect on their children's poverty. They find that children's income is significantly related to both their fathers' and mothers' income. However, we find that the income of children is only related to their mothers' education, and fathers' education doesn't play a significant role in it. Second, the parental influence on progeny income is very small, with the marginal contribution of the mother's education to the natural logarithm of the income of children is only 1.1%. Our result is consistent with the research results of [Lu & Pan \(2016\)](#), and [Guo & Zhou \(2017\)](#). Policymakers may find these conclusions reassuring since they imply that individuals can escape the adverse effects from their parents and successfully achieve wealth growth.

Based on the model (2) of Table 2, other control variables also have an effect on individual income. Gender is significant at the level of 1%, with the natural logarithm of income of males an average of 36.3% higher than the females. This reflects the large gap between the income levels of men and women in China. The significance of the variables of age and age squared of the progeny, and the direction of marginal contribution, indicates a significant inverted U-shaped relationship between the progeny's income and age. Compared with youth and old age, individual income peaks in middle age, a conclusion supported by the general income life cycle theory ([Heckman, 1974](#)).

Among the progeny's human capital variables, health, education, foreign language, and occupational qualification certificate all have a significant effect on their income, reflecting the importance of attaining human capital for increasing individual income. Specifically, the natural logarithm of the income of the person with fair health is 23.8% higher than that of the person in poor health, the natural logarithm of the income of the person with good health is 38.1% higher than that of the person with poor health, and the natural logarithm of the income of the exceptionally healthy person is 46.2% higher than that of the person in poor health. It shows that the healthier the individual, the higher the income. This finding is consistent with Schultz's theory of human capital (Schultz, 1971 & 1993). For policymakers, improving the health level of social members is conducive to improving the income and welfare of social members. On average, education level increased by one year increases the natural logarithm of the income by 4.3%. This shows that education is an important factor for increasing income. On average, the natural logarithm of the income of a person who knows a foreign language is 7.3% higher than that of a person who does not know a foreign language. With the continuous development of economic globalization, the current market economy has extended to all parts of the world. Therefore, mastering the necessary foreign languages can expand opportunities for individuals to increase their income, as demonstrated in this paper. On average, the natural logarithm of the income of a person with an occupational qualification certificate is 13.8% higher than that of a person without an occupational qualification certificate. This highlights the importance of professionalism in increasing income. For people's livelihood and development, it is necessary to master a skill.

For social capital, the progeny's household registration significantly increases their income at a 1% level. The natural logarithm of income for those with non-agricultural household registration at birth is 9.9% higher than those with agricultural household registration. This confirms the previous theoretical analysis that household registration is an important social capital in China. Membership in the Communist Party of China positively and significantly affects individual income, for an increase of 5.7% compared to those who are not. The number of acquaintances has no significant effect

on the individual's income.

In terms of the working environment, the work industry positively and significantly affects individual's income at a 1% level. The natural logarithm of income of those who work in non-agricultural industry is 68.4% higher than that of those who work in agricultural industry. Thus, the average wage rate of China's agricultural industry needs to be further improved to catch up with that of individuals working in a nonagricultural sector.

The region where an individual is located is another important factor in the income of the individual, with income levels in the central and eastern regions being higher than in the western regions. Specifically, on average, the natural logarithm of income for individuals in the central region is 15.3% higher than that in the west, and the natural logarithm of income for individuals in the eastern region is 31.0% higher than that in the west. This shows that China's regional income gap is large.

<TABLE 2 APPROXIMATELY HERE>

5.2 Quantile regression results

In order to measure the effect of parental capital on progeny income at different income levels, we use a quantile regression model to regress the data. Results from the quantile regression model are reported in [Table 3](#). These results are generally consistent with results obtained from ordinary least square regression. The father's household registration, father's education, and mother's household registration do not have a significant effect on the income of the children at all points, and the mother's education has a significant effect on the income of the children at each quantile level. On average, the number of years of education for mothers increased by one year, and the natural logarithm of the children's income increased by 0.8 to 1.5%, with an average value about 1.1% across all deciles. The lowest impact is found in the 0.2, 0.3, and 0.4 quantiles (0.8%), while the highest impact is found in the 0.9 quantile (1.5%). This means that the impact of the mother's education on high-income children is almost double that of median-income and lower income level income children. Our result

indicates that the mother's capitals are more important for the child's future than the father's, which is similar with the conclusion of Beller (2009).

In terms of individual demographic characteristics, the individual's gender, age, and age squared have significant effects on their income at every quantile. Specifically, gender has a significant positive effect on income at a 1% level on the all quantiles. The coefficient on the 0.1 quantile is 0.428, on the 0.2 quantile is 0.389, on the 0.3 quantile is 0.394, on the 0.4 quantile is 0.374, on the 0.5 quantile is 0.365, on the 0.6 quantile is 0.348, on the 0.7 quantile is 0.337, on the 0.8 quantile is 0.318, and on the 0.9 quantile is 0.293. This indicates that the effect of gender on income is more important among low-income groups than in high-income groups. The significance of the variables of age and age squared of the progeny and the direction of marginal contribution indicates a significant inverted U-shaped relationship between the progeny's income and age on all quantiles.

Individual human capital results indicate health, education, and foreign languages have a significant and positive effect on individual income at each quantile. The occupational qualification certificate has a significant and positive effect on individual income at the 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, and 0.7 quantiles, but is not significant for individual income at the 0.8 and 0.9 quantiles. The results indicate that the occupational qualification certificate has a significant effect on the income of middle and low-income people, but not on the income of high-income people. Nevertheless, we can still think that health, education, language skills, and vocational skills are important factors affecting one's income.

In terms of an individual's social capital, the progeny's household registration at birth has a significant and positive effect on individual income at the 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, and 0.8 quantiles, but not at the 0.9 quantile. Overall, it can still be considered an important factor affecting individual income. The political status of the progeny has a significant and positive effect on individual income at the 0.1, 0.4, 0.5, 0.6, and 0.7 quantiles. Therefore, the regularity of the effect of the political status of progeny on their income is difficult to observe. The number of acquaintances of the progeny has no significant effect on individual income at each quantile.

The characteristics of the working environment indicate that the work industry of the progeny has a significant effect on their own income at all quantiles. The effect of region on individual income is also significant at all quantiles.

In summary, the influence of parental capital on progeny income is heterogeneous, partial, and limited. The parental factor does not have a large effect on the income of the progeny, and the human capital of the progeny have a significant effect on their own income.

<TABLE 3 APPROXIMATELY HERE>

5.3 Robustness tests

In order to eliminate the effect of heteroscedasticity, we adopt robust regression in the part of result analysis. Also, we utilize a variety of other models to test the robustness of the preceding results. First, we use sub-sample regression to test the robustness of previous regression results, and the results are reported in [Table 4](#). Thirteen sub-samples are returned based on gender, whether they understand foreign languages, whether they have occupational qualifications, the nature of the household registration at birth, the work industry, and the region in which they were located.

From the regression results of the 13 sub-samples, the influence of the mother's education on the income of the children is significant at all 13 sub-samples. The results indicate that the influence of the mother education's on progeny income is stable. This again confirms the previous finding that mother's education is an important factor in the income of the next generation, albeit the magnitude is small.

The influence of the father's education on the income of the children is only significant in the sample of the children who have no occupational qualifications or who live in the central region. The influence of the father's household registration on the income of the children is only significant in the sample of the children who are female or who live in the central region. The influence of mother's household registration on the income of the children is significant in the sample of the children who are male and who are female.

The education and occupational qualification certificate of the progeny have significant and positive effects on income in all sub-samples, and health almost always has a significant and positive effect on the progeny's income in all sub-samples. These indicate that human capital is an important factor affecting individual income.

<TABLE 4 APPROXIMATELY HERE>

Second, we examine the effect of parental capitals on individuals' income at the same age cohort, which is reported in [Table 5](#). Except for those under 30 years old, the influence of the mother's education on the income of the children in other age groups is significant. Specifically, it is significant at 10% between 30 and 40, 40 and 50, and 50 and 60 years of age, and at 1% over 60 years old. This again confirms the previous finding that mother's education is an important factor in the income of the next generation. The mother's education has 1-3% impact on the children's income when this variable is significant in a given quantile. The effect is the highest at the highest age cohort.

6. Conclusion and Discussion

Many sayings exist about the "rich second generation" or "poor second generation" today. These can perpetuate falsehoods in society, and reinforce beliefs such as "you are poor because your father is poor." The consequence is that such adages may lower ambition among some young people, thereby harming societal development. However, the result of this paper is that the influence of parental capital on the income of the children is limited, the effect is only through the mother, and the progeny's accumulation of human capital is the main factor affecting income.

There are four major findings from our analysis: 1) the effects of the human capital and social capital of the father and mother on the progeny's income are heterogeneous. Specifically, the father's level of education, the nature of the father's household

registration, and the nature of mother's household registration have little effect on their progeny's income. The level of the mother's education has a positive and significant effect on her progeny's income. 2) The effect of the mother's education on the progeny's income is limited, and the marginal contribution of the mother's education on the natural logarithm of the progeny's income is only 1.1%. 3) The progeny's own human capital, such as health, education, foreign language ability, and professional certifications, significantly affects their income. 4) The results of quantile regression support the above findings. Therefore, we suggest that improving the mother's human capital is conducive to preventing the intergenerational transmission of poverty in China to some extent. However, most importantly, it is the progeny who needs to work on his/her own to improve human capital to increase income.

These results generate the following policy implications: in the practice of preventing the intergenerational transmission of poverty, the policy resource delivery to the parents should be heterogeneous. Specifically, investment in maternal education may have a multiplier effect on increasing the income of the progeny and preventing the poverty of the children. Klasen (2002) ponders if low schooling for girls is slower growth for all so based on this and the fact that today's girls are tomorrow's mother, education to girl should be focus. Another approach to educating adults may be farmer field school (Duveskog et al. 2011) or adult literacy program (de Baldini Rocha & Ponczek, 2011). These programs can help parents to gain education that would help to grow better crops, increase earning potential, or function better in their lives. These positive outcomes can in turn affect children's life positively.

In addition to the heterogeneous investment in the parents, the more effective way to improve the income of the children is to directly invest in human capital for the children. By strictly implementing the compulsory education system, effectively improving the enrollment rate and graduation rate of compulsory education, preventing school dropouts, reducing the cost of education for children of low-income families, and fully implementing free nutritious meals for students in kindergarten and compulsory education, the future income of individuals will benefit. These measures play an important role in preventing the intergenerational transmission of poverty.

Data Availability Statement

Data used will be made available from the corresponding author upon request.

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Figure

Figure 1.

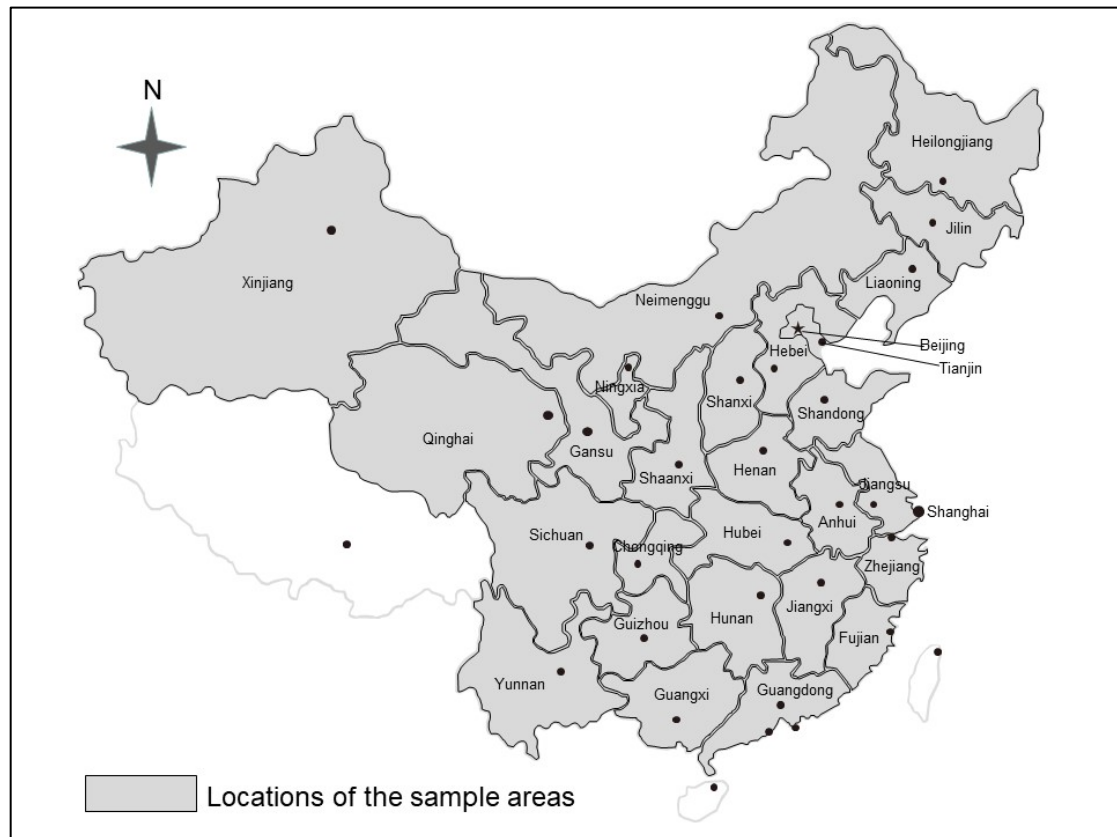


Figure 1: Coverage of sample locations and respective provinces in China used in the analysis

Table 1. Variable definitions and descriptive statistics

Variables	Definition	Mean	S.D.
<i>Dependent variable</i>			
Progeny income	The total income of the progeny in 2013 (yuan)	33779.89	91585.34
<i>Independent variables</i>			
Father education	Father's number of years of school education	5.09	4.52
Father household registration	Father has non-agricultural household registration=1; otherwise agricultural household registration=0	0.14	0.34
Mother education	Mother's number of years of school education	3.60	4.20
Mother household registration	Mother has non-agricultural household registration=1; otherwise agricultural household registration=0	0.13	0.33
<i>Progeny control variables</i>			
Health	Best health=1	Best	——
	Good health=1	Good	
	Fair health=1	Fair	
	Else poor health=0	Poor	
Education	Number of years of school education	8.96	4.41
Foreign language	Knows one or more foreign languages=1; otherwise=0	0.13	0.33
Occupational qualification certificate	Has one or more occupational qualification certificate=1; otherwise=0	0.16	0.37
Progeny's household registration	If the nature of household registration at birth of sample is non-agricultural household registration=1; otherwise agricultural household registration=0	0.17	0.38
Party	If a member of Communist Party of China=1; otherwise=0	0.10	0.30
Acquaintance	The number of acquaintances knowing by the sample	14.27	45.24
Male	Male=1; female=0	0.55	0.50
Age	The age(year)	46.35	11.85
Work industry	Work industry (Non-agricultural industry=1; otherwise=0)	0.59	0.49
Location	Regional location of sample:	——	——
	1 if central region=1	CR	
	1 if eastern region=1	ER	
	otherwise western region=0	WR	

Table 2. Robust OLS regression results of the effects of parental capitals and other control variables on the income of the progeny (N=11,445)

Variables	Natural logarithm of income of the progeny	
	(1)	(2)
Father education	0.039*** (0.003)	0.003 (0.003)
Father household registration	0.204*** (0.049)	-0.026 (0.042)
Mother education	0.047*** (0.003)	0.011*** (0.003)
Mother household registration	0.239*** (0.051)	0.023 (0.045)
<i>Progeny control variables</i>		
Fair health		0.238*** (0.036)
Good health		0.381*** (0.035)
Best health		0.462*** (0.037)
Education		0.043*** (0.003)
Foreign language		0.073*** (0.027)
Occupational qualification certificate		0.138*** (0.022)
Progeny's household registration		0.099*** (0.031)
Party		0.062** (0.028)
Acquaintance		0.000 (0.000)
Male		0.363*** (0.018)
Age		-0.004*** (0.001)
Age squared		-0.001*** (0.000)
Work industry		0.684*** (0.023)
Central region		0.153*** (0.024)
Eastern region		0.310***

		(0.021)
Constant	9.377***	8.577***
	(0.017)	(0.070)
R-squared	0.128	0.397

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3.

Quantile regression results of the effects of parental capitals and other control variables on the income of the progeny (N=11445)

Variables	Natural logarithm of income of the progeny								
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Father education	0.001 (0.006)	-0.003 (0.004)	-0.000 (0.003)	-0.000 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.004)	0.004 (0.004)	0.007 (0.006)
Father household registration	0.041 (0.076)	0.005 (0.050)	-0.002 (0.034)	-0.036 (0.037)	-0.015 (0.036)	-0.003 (0.032)	0.004 (0.054)	0.017 (0.052)	-0.090 (0.074)
Mother education	0.011** (0.005)	0.008* (0.004)	0.008** (0.003)	0.008** (0.003)	0.009** (0.004)	0.009*** (0.003)	0.011*** (0.003)	0.011*** (0.004)	0.015*** (0.004)
Mother household registration	-0.088 (0.069)	-0.059 (0.050)	-0.026 (0.046)	0.045 (0.047)	0.052 (0.040)	0.044 (0.039)	0.023 (0.061)	-0.020 (0.049)	0.080 (0.079)
<i>Progeny control variables</i>									
Fair health	0.325*** (0.064)	0.305*** (0.045)	0.311*** (0.061)	0.254*** (0.059)	0.227*** (0.046)	0.189*** (0.043)	0.203*** (0.033)	0.154*** (0.039)	0.134** (0.057)
Good health	0.473*** (0.059)	0.456*** (0.047)	0.448*** (0.058)	0.389*** (0.055)	0.339*** (0.041)	0.305*** (0.041)	0.297*** (0.034)	0.262*** (0.044)	0.270*** (0.063)
Best health	0.560*** (0.068)	0.510*** (0.044)	0.505*** (0.053)	0.438*** (0.053)	0.400*** (0.038)	0.373*** (0.039)	0.366*** (0.037)	0.328*** (0.046)	0.332*** (0.057)
Education	0.046*** (0.007)	0.048*** (0.005)	0.047*** (0.005)	0.046*** (0.004)	0.045*** (0.005)	0.043*** (0.003)	0.043*** (0.003)	0.039*** (0.003)	0.044*** (0.004)
Foreign language	0.109*** (0.032)	0.089*** (0.025)	0.090*** (0.024)	0.062*** (0.021)	0.075*** (0.025)	0.093*** (0.027)	0.124*** (0.022)	0.145*** (0.026)	0.139*** (0.048)

Occupational qualification certificate	0.209*** (0.042)	0.174*** (0.026)	0.150*** (0.022)	0.139*** (0.022)	0.126*** (0.021)	0.126*** (0.018)	0.094*** (0.019)	0.039 (0.026)	0.050 (0.051)
Progeny's household registration	0.133** (0.053)	0.130*** (0.039)	0.083*** (0.026)	0.073*** (0.028)	0.071** (0.028)	0.075** (0.032)	0.085** (0.036)	0.133*** (0.046)	0.067 (0.057)
Party	0.087** (0.040)	0.049 (0.040)	0.060 (0.038)	0.080** (0.032)	0.073*** (0.027)	0.067** (0.032)	0.051* (0.028)	0.049 (0.032)	0.018 (0.051)
Acquaintance	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.001)
Male	0.428*** (0.040)	0.389*** (0.026)	0.394*** (0.020)	0.374*** (0.020)	0.365*** (0.014)	0.348*** (0.016)	0.337*** (0.016)	0.318*** (0.014)	0.293*** (0.034)
Age	-0.001 (0.002)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.002 (0.001)
Age squared	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Work industry	1.179*** (0.050)	1.028*** (0.050)	0.913*** (0.031)	0.807*** (0.024)	0.683*** (0.022)	0.570*** (0.024)	0.473*** (0.027)	0.378*** (0.021)	0.260*** (0.036)
Central region	0.134*** (0.036)	0.130*** (0.039)	0.139*** (0.029)	0.111*** (0.018)	0.120*** (0.020)	0.114*** (0.023)	0.094*** (0.029)	0.099*** (0.022)	0.101** (0.047)
Eastern region	0.345*** (0.042)	0.344*** (0.035)	0.333*** (0.025)	0.312*** (0.017)	0.284*** (0.020)	0.260*** (0.019)	0.246*** (0.021)	0.240*** (0.026)	0.260*** (0.038)
Constant	6.975*** (0.107)	7.652*** (0.112)	8.007*** (0.108)	8.358*** (0.113)	8.667*** (0.095)	9.018*** (0.090)	9.244*** (0.058)	9.596*** (0.068)	9.864*** (0.081)

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4.

Sub-sample regression results of the effect of parental capital and other control variables on progeny's income

Variables	Natural logarithm of income of the progeny												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Male	Female	Foreign language	No foreign language	Prof. certified	Not prof. certified	Non-agri. household registration	Agri. household registration	Non-agri. industry	Agri. industry	Western region	Central region	Eastern region
Father education	0.003 (0.004)	0.004 (0.004)	0.000 (0.007)	0.003 (0.003)	-0.007 (0.005)	0.006* (0.003)	-0.005 (0.005)	0.005 (0.003)	0.001 (0.003)	0.006 (0.005)	-0.007 (0.005)	0.017*** (0.005)	0.001 (0.004)
Father household registration	0.040 (0.055)	-0.118* (0.065)	0.049 (0.072)	-0.035 (0.050)	-0.011 (0.058)	-0.032 (0.055)	0.001 (0.054)	-0.020 (0.064)	-0.010 (0.041)	-0.151 (0.163)	-0.003 (0.084)	-0.164** (0.078)	0.029 (0.062)
Mother education	0.011*** (0.004)	0.010** (0.005)	0.016** (0.007)	0.010*** (0.003)	0.010* (0.006)	0.012*** (0.003)	0.014** (0.005)	0.011*** (0.003)	0.008*** (0.003)	0.022*** (0.007)	0.010* (0.006)	0.011** (0.006)	0.010** (0.004)
Mother household registration	-0.097* (0.057)	0.183** (0.071)	0.007 (0.077)	0.006 (0.054)	-0.008 (0.062)	0.035 (0.059)	0.026 (0.053)	-0.013 (0.093)	0.017 (0.043)	0.287 (0.244)	0.072 (0.093)	-0.013 (0.080)	0.047 (0.066)
Progeny control variables													
Fair health	0.271*** (0.050)	0.212*** (0.053)	0.110 (0.122)	0.241*** (0.038)	0.116 (0.099)	0.242*** (0.039)	0.230** (0.115)	0.227*** (0.038)	0.161*** (0.052)	0.236*** (0.049)	0.334*** (0.060)	0.224*** (0.064)	0.076 (0.063)
Good health	0.427*** (0.049)	0.336*** (0.051)	0.169 (0.116)	0.389*** (0.037)	0.180* (0.097)	0.399*** (0.038)	0.305*** (0.112)	0.376*** (0.037)	0.273*** (0.050)	0.395*** (0.049)	0.415*** (0.059)	0.460*** (0.063)	0.197*** (0.062)
Best health	0.503*** (0.050)	0.421*** (0.056)	0.144 (0.119)	0.494*** (0.039)	0.200** (0.101)	0.499*** (0.040)	0.254** (0.114)	0.493*** (0.040)	0.301*** (0.052)	0.597*** (0.056)	0.536*** (0.065)	0.536*** (0.067)	0.266*** (0.064)
Education	0.044*** (0.004)	0.041*** (0.005)	0.067*** (0.010)	0.040*** (0.003)	0.063*** (0.008)	0.038*** (0.003)	0.078*** (0.007)	0.037*** (0.003)	0.052*** (0.004)	0.031*** (0.005)	0.052*** (0.005)	0.038*** (0.006)	0.036*** (0.004)

Foreign language	0.077** (0.036)	0.048 (0.040)			0.100** (0.042)	0.059 (0.036)	0.098** (0.041)	0.053 (0.035)	0.093*** (0.027)	0.006 (0.138)	0.020 (0.052)	-0.005 (0.055)	0.154*** (0.037)
Occupational qualification certificate	0.110*** (0.028)	0.177*** (0.038)	0.083* (0.043)	0.144*** (0.026)			0.068** (0.033)	0.168*** (0.029)	0.115*** (0.023)	0.210** (0.096)	0.180*** (0.043)	0.056 (0.046)	0.162*** (0.032)
Progeny's household registration	0.087** (0.040)	0.117** (0.050)	0.028 (0.067)	0.115*** (0.035)	0.080 (0.052)	0.111*** (0.039)			0.064** (0.032)	0.634*** (0.157)	0.125** (0.056)	0.080 (0.057)	0.097* (0.050)
Party	0.040 (0.034)	0.098** (0.047)	0.030 (0.048)	0.057* (0.033)	0.056 (0.042)	0.043 (0.036)	0.037 (0.040)	0.041 (0.036)	0.032 (0.028)	0.043 (0.073)	0.086* (0.048)	0.046 (0.052)	0.046 (0.043)
Acquaintance	0.000 (0.000)	-0.000 (0.000)	0.000 (0.001)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001* (0.000)	0.000 (0.000)	0.001* (0.000)	-0.000 (0.000)	0.000 (0.000)	0.001 (0.000)	-0.000 (0.000)
Male			0.337*** (0.043)	0.369*** (0.019)	0.278*** (0.038)	0.381*** (0.020)	0.279*** (0.034)	0.386*** (0.020)	0.347*** (0.019)	0.388*** (0.035)	0.293*** (0.035)	0.440*** (0.034)	0.366*** (0.025)
Age	-0.004*** (0.001)	-0.003** (0.002)	0.003 (0.004)	-0.006*** (0.001)	0.003 (0.002)	-0.005*** (0.001)	0.006*** (0.002)	-0.005*** (0.001)	-0.000 (0.001)	-0.010*** (0.002)	-0.006*** (0.002)	-0.003* (0.002)	-0.004*** (0.001)
Age squared	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Work industry	0.682*** (0.029)	0.682*** (0.037)	0.582*** (0.138)	0.688*** (0.023)	0.598*** (0.091)	0.679*** (0.024)	0.107 (0.111)	0.694*** (0.024)			0.740*** (0.041)	0.622*** (0.043)	0.685*** (0.036)
Central region	0.202*** (0.030)	0.088** (0.037)	-0.030 (0.061)	0.178*** (0.025)	-0.053 (0.050)	0.188*** (0.026)	-0.060 (0.040)	0.208*** (0.027)	0.044 (0.027)	0.273*** (0.039)			
Eastern region	0.318*** (0.027)	0.299*** (0.033)	0.336*** (0.054)	0.305*** (0.023)	0.257*** (0.043)	0.318*** (0.024)	0.247*** (0.039)	0.322*** (0.024)	0.247*** (0.023)	0.383*** (0.040)			
Constant	8.924*** (0.094)	8.572*** (0.113)	8.532*** (0.290)	8.633*** (0.074)	8.650*** (0.200)	8.607*** (0.076)	8.579*** (0.217)	8.645*** (0.076)	9.210*** (0.086)	8.782*** (0.118)	8.543*** (0.123)	8.640*** (0.134)	9.141*** (0.115)
Observations	6,341	5,104	1,457	9,988	1,848	9,597	1,969	9,476	6,742	4,703	3,538	3,135	4,772
R-squared	0.376	0.371	0.275	0.373	0.235	0.368	0.204	0.366	0.201	0.179	0.387	0.369	0.350

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5. Age-based regression results of the effect of parental capital and other control variables on progeny's income

Variables	(1)	(2)	(3)	(4)	(5)
	age<30	30<=age<40	40<=age<50	50<=age<60	Age>=60
Father education	0.010 (0.010)	0.001 (0.006)	-0.002 (0.004)	0.006 (0.005)	-0.002 (0.009)
Father household registration	0.057 (0.153)	0.038 (0.081)	-0.102 (0.069)	-0.009 (0.088)	0.082 (0.142)
Mother education	0.004 (0.010)	0.011* (0.006)	0.009* (0.005)	0.011* (0.006)	0.034*** (0.012)
Mother household registration	0.154 (0.144)	-0.125 (0.088)	0.053 (0.070)	0.041 (0.097)	0.025 (0.163)
<i>Progeny control variables</i>					
Fair health	0.016 (0.243)	0.140 (0.117)	0.213*** (0.068)	0.244*** (0.065)	0.242*** (0.070)
Good health	0.029 (0.234)	0.305*** (0.115)	0.334*** (0.065)	0.412*** (0.064)	0.351*** (0.070)
Best health	0.093 (0.234)	0.300** (0.117)	0.436*** (0.068)	0.545*** (0.070)	0.507*** (0.087)
Education	0.017 (0.013)	0.060*** (0.007)	0.053*** (0.006)	0.047*** (0.006)	0.024*** (0.007)
Foreign language	-0.061 (0.069)	0.089* (0.046)	0.138*** (0.047)	0.133* (0.071)	0.428** (0.173)
Occup. Qualif. certificate	0.095 (0.067)	0.078* (0.042)	0.131*** (0.036)	0.189*** (0.048)	0.295*** (0.103)
Progeny's household regis.	-0.096 (0.143)	0.112* (0.062)	0.076 (0.048)	0.139** (0.060)	0.134 (0.124)
Party	0.144 (0.109)	0.006 (0.057)	-0.050 (0.045)	0.108* (0.056)	0.042 (0.074)
Acquaintance	-0.001 (0.001)	0.000 (0.000)	0.001 (0.001)	0.000* (0.000)	-0.000 (0.000)
Male	0.250*** (0.055)	0.398*** (0.035)	0.425*** (0.030)	0.328*** (0.038)	0.294*** (0.058)
Age	0.113 (0.191)	-0.025 (0.057)	-0.002 (0.009)	-0.015 (0.039)	0.237** (0.105)
Age squared	0.000 (0.005)	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.008*** (0.003)
Work industry	0.555*** (0.108)	0.514*** (0.060)	0.650*** (0.039)	0.662*** (0.042)	0.885*** (0.057)
Central region	0.127	0.126**	0.152***	0.122**	0.276***

	(0.088)	(0.052)	(0.039)	(0.048)	(0.061)
Eastern region	0.311***	0.297***	0.353***	0.289***	0.340***
	(0.069)	(0.045)	(0.036)	(0.044)	(0.062)
Constant	5.550	9.535***	8.443***	9.032***	-4.613
	(6.900)	(2.312)	(0.427)	(1.948)	(5.807)
Observations	1,134	2,266	3,324	2,858	1,863
R-squared	0.197	0.311	0.377	0.363	0.334

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.