

# ***Intergenerational Income Mobility in Urban China<sup>\*</sup>***

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## **Abstract**

This paper estimates the intergenerational income elasticity for urban China, paying careful attention to the potential biases induced by income fluctuations and life cycle effects. Our preferred estimates are that the intergenerational income elasticities are 0.63 for father-son, 0.97 for father-daughter, 0.36 for mother-son, and 0.64 for mother-daughter. This suggests that while China has experienced rapid growth of absolute incomes, the relative position of children in the distribution is largely determined by their parents' incomes. By investigating possible causal channels, we find that parental education, occupation, and Communist Party membership all play important roles in transmitting economic status from parents to children.

**JEL Codes: D10, D31**

**Keywords:** intergenerational mobility, transgenerational persistence, political party membership.

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# Intergenerational Income Mobility in Urban China

## *1. Introduction*

Economists have long been interested in the issue of intergenerational mobility. Estimating the relationship between the permanent incomes of parents and children is a critical component of a society's income dynamics. A growing body of research has demonstrated large and systematic differences across nations, with parental income being a major determinant of children's incomes in some countries, and much less important in others. To date, much of the existing research on intergenerational mobility has focused on developed nations. While this has the advantage that data sources are generally more reliable, developed nations also tend to be politically stable and to have experienced modest rates of growth.

By contrast, the growth experience of China over the past three decades has been nothing short of unprecedented. As the world's most populous nation, Chinese living standards have risen six-fold since 1979. These rapid economic changes have also been accompanied by dramatic social transformations. All this makes China a unique case study through which to better understand the relationship between societal change and income mobility.

In traditional Chinese society (prior to 1949), most social welfare was familial. There was a strong reciprocal relationship between parents and children. Parents normally invested a large proportion of their income and assets in their offspring's education and career development (and the parental social network played an important role in children's access to education and the labour market). Children typically lived with their parents until marriage (and in many cases, after marriage as well). In return, parents expected their children to support them in old age.

During the Maoist era (1949-77), social welfare was universally provided in urban areas, with the aim of making Chinese society more egalitarian.<sup>4</sup> By and large, this

<sup>4</sup> After the Communist Party took power in 1949, the Chinese economy was divided into two parts--urban and rural economies. One important division between the two groups was the provision of social welfare. The cradle-to-grave social welfare system was only available to urban population, while the rural population were not covered by any welfare. This division has remained and even today it is extremely

successfully compressed the distribution of income and wealth over the Maoist period (Meng 2004, 2007; Benjamin, Brandt, Giles and Wang, 2005). In addition, the early socialist revolution attempted to weaken the social ties between parental and children's occupations by making it impossible for children to inherit any meaningful wealth from their parents, and opening up better opportunities for education and occupational attainment for the children of poor families (Cheng and Dai, 1995). These might have facilitated an increase in intergenerational income mobility.

However, close family ties still exist and continue to deliver economic and social advantages from one generation to another. Indeed, some government policies have even decreased mobility. For instance, the policies of intergenerational job replacement (Dingtí) and internal recruitment (Neizhao), which were introduced in 1977 and then abolished in 1986, might have reduced the level of mobility in urban China (Yu and Liu, 2004).<sup>5</sup> In addition, the unique household registration system initiated in Mao's era restricted geographic labor mobility, not only from rural to urban but also from small urban cities to large urban cities, and such restrictions no doubt reduced intergenerational mobility (Wu and Treiman, 2003).<sup>6</sup>

The transition from a planned to a market oriented economy initiated in the late 1970s and early 1980s has moved the urban society away from the social provision of welfare back to one that relies heavily upon individual and family responsibilities (Cai, Giles and Meng, 2006). As a consequence, income and wealth inequality in urban China have increased sharply (see, for example, Meng, 2004 and Meng 2007). Family networks play an important role in job attainment, which, in turn, may have reduced intergenerational income mobility. Conversely, a steady increase in geographic mobility

difficult for people who were born in rural areas to gain urban household registration and to access the urban social welfare system.

<sup>5</sup> Yu and Liu (2004) find that since 1978, the sector, rank and size of parents' work unit have had significant effects on that their children's first job, and this effect did not attenuate even after 1986 when these two policies were abolished.

<sup>6</sup> In Mao's era, China's unique household registration system restricted people in rural areas or small cities from accessing better opportunities in urban areas or large cities. They could only move permanently across regions by achieving tertiary education, getting military experience, or being recruited into a state-owned enterprise. Under the household registration system, most parents and children would locate in the same city. The intergenerational persistence in locality enhanced the intergenerational persistence in education and labor market outcomes due to systematic regional disparities in educational quality and labor markets.

may have boosted intergenerational mobility across China as a whole (Wu and Treiman, 2003; Yu and Liu, 2004; Takenoshita, 2007).<sup>7</sup>

A few studies on intergenerational mobility in China appear mainly in the sociological literature. These generally focus on social stratification and political affiliation. Such studies mainly concentrate on occupational mobility and find strong intergenerational transmission in occupations and industries (Lin and Bian, 1991; Cheng and Dai 1995; Takenoshita, 2007). In general, Communist Party members and state employees (especially government officials) have many social advantages in obtaining entrance into university, or locating better job opportunities for their children (Lin and Bian, 1991; Walder, Li and Treiman, 2000; Bian, 2002; Meng, 2007).

The only other study on intergenerational income mobility in urban China is Guo and Min (2008), who use the Chinese Urban Household Education and Employment Survey 2004 (UHEES 2004). They estimate the overall intergenerational income elasticity in urban China to be 0.32 (for fathers and sons) and find that education has played an important role in promoting intergenerational income mobility. However, their study uses only one income observation for parents, and one income observation for children. However the unprecedented income growth and significant structural changes noted above may have had a differential impact on Chinese birth cohorts in recent years. Consequently, parental lifetime income may differ considerably across cohorts. Using parental income at a single point in time may substantially mis-state permanent lifetime income. We, therefore, aim to advance on Guo and Min (2008) by accounting for life cycle variation of income, and exploring the possible role of parental social status in determining children's outcomes.

This paper combines UHEES 2004 with repeat cross-sectional datasets covering nearly 20 years. As a preview, our results show much higher intergenerational income elasticity than the previous estimates by Guo and Min (2008). After accounting for

<sup>7</sup> After China's post-1978 economic reforms, the household registration system was gradually relaxed, with permission no longer required for temporary moves across regions, and local registration no longer needed in order to acquire an informal job or to run an individual business. However, to access the jobs in the public sector, or to access social welfare system, people are still required to obtain the urban local household registration. Note also that because our study focuses only on urban China, we will only be able to estimate intergenerational income mobility for that portion of the country.

fluctuations in parents' incomes and life cycle variation in children's incomes, we estimate that the intergenerational elasticity in urban China is around 0.63 for father-son, 0.97 for father-daughter, 0.36 for mother-son, and 0.64 for mother-daughter. This is an extremely high level of intergenerational persistence, and implies that intergenerational mobility is much lower in China than in most developed nations. Exploring the channels through which income is transmitted across generations, we conclude that in urban China parental education, occupation, industry, and Communist Party membership all play important roles in transmitting economic status from parents to children.<sup>8</sup>

The paper is structured as follows. Section 2 reports the methodology used to estimate intergenerational income elasticity. Section 3 describes the data and summarizes the statistics. Section 4 presents estimates of intergenerational income and earnings elasticities. Section 5 explores the main channels through which income is transmitted from parents to children. The final section concludes.

## 2. Methodology

Studies of intergenerational mobility generally estimate the association between the socioeconomic status of parents and their offspring. Becker and Tomes (1979) first suggested a log-linear intergenerational income regression to estimate the intergenerational elasticity:

$$y_{ci} = \alpha + \beta y_{pi} + \varepsilon_i, \quad (1)$$

where  $y_{ci}$  is the log of children's income, and  $y_{pi}$  is the log of parents' income. The coefficient  $\beta$  is the intergenerational income elasticity. The larger the elasticity, the less mobility in a given society. In our empirical analysis, we modify Equation (1) by controlling for a quadratic in children's age and a quadratic in parental age, and including indicator variables for the 16 regions that comprise our sample (see footnote 14):

$$y_c = \alpha + \beta y_p + \varphi_1 A_{ci} + \varphi_2 A_{ci}^2 + \gamma_1 A_{pi} + \gamma_2 A_{pi}^2 + \delta R_c + \varepsilon_i, \quad (2)$$

<sup>8</sup> It is important to note that our paper studies intergenerational income mobility among the urban population. Given the huge institutional difference in income distribution and social welfare provision between urban and rural populations, we are not claiming that our results have general implications for China as a whole.

where  $A_{ci}$  is the child's age minus 40 (and  $A_{ci}^2$  is its square),  $A_{pi}$  is the parent's age (and  $A_{pi}^2$  is its square).  $R_{ci}$  is a vector of regional dummy variables capturing regional variation in prices.<sup>9</sup>

Ideally, intergenerational mobility calculations should estimate the elasticity of lifetime income between children and parents.<sup>10</sup> Using just one year's earnings/income data for parents and children can lead to a significant underestimate of the true lifetime intergenerational elasticity (Solon, 1992; Mazumder, 2005; Grawe, 2006; Haider and Solon, 2006; Bohlmark and Lindquist, 2006; Dunn, 2007).<sup>11</sup>

In order to deal with the measurement error from using one year earnings/income to proxy for lifetime earnings/income, previous studies take an average of income over a number of different years for parents in order to obtain a better estimate of permanent income (Solon, 1992; Lee and Solon, 2006; Nicoletti and Ermisch, 2007). However, Mazumder (2005) argues that the transitory component of income is highly persistent and even a five year average may still provide a rather poor measurement of permanent income.

Measurement error in the dependent variable (in this case log children's income) does not in itself lead to attenuation bias. However, Grawe (2006) and Haider and Solon (2006) point out that attenuation bias can be caused by using log current earnings when children are in their twenties (a point at which current income may be quite different from average lifetime income). This can lead to a downward bias of the estimated intergenerational elasticity. Similarly, using the log current income for parents who are more likely to be observed late in their life cycle, will further downward bias the estimate

<sup>9</sup> Of course there is an argument that regional income variations should not be controlled for because this may be one of the important channels through which family background can affect children's outcomes. We therefore estimate Equation (2) both with and without the regional controls in order to test the sensitivity of their inclusion.

<sup>10</sup> In theory, one might argue that what should be important is not a parent's lifetime income, but the amount of resources available in the household during the years when the child was growing up. In practice, most researchers have typically regarded this issue as being less important than obtaining a stable measure of parental income or earnings.

<sup>11</sup> For instance, Dunn (2007) finds that in Brazil, the intergenerational earnings elasticity grows sharply with son's age, reaching a maximum for sons aged 49, before falling slightly as son's age increases further. Father's age is found to have much less effect on mobility estimates than the son's age and the use of father's age over 40 produces quite stable elasticity estimates.

of intergenerational elasticity (Grawe, 2006, and Haider and Solon, 2006). The first error can be minimized by using log current income measured when children are aged in their thirties or forties (a point at which current income is close to average lifetime income). To address these possible biases, prior researchers also use other methods, such as controlling for the age of both children and parents, averaging parental income over multiple years, or predicting parental lifetime income by instrumenting income using parental characteristics (Reville, 1995; Dearden, Machin and Reed, 1997; Bjorklund and Jantti, 1997; Fortin and Lefebvre, 1998; Grawe, 2001; Chadwick and Solon, 2002; Mazumder, 2005; Lefranc and Trannoy, 2005; Haider and Solon, 2006; Grawe, 2006; Ferreira and Veloso, 2006; Lee and Solon, 2006; Nicoletti and Ermisch, 2007; Herz *et al.*, 2007; Mocetti, 2007; Dunn, 2007; Leigh, 2007). However, a key issue in the instrumental variable approach is selecting instruments that only affect children's earnings through the channel of parental earnings, and do not directly impact children's earnings (Solon, 1992).

In addition to general issues that arise when estimating intergenerational elasticities, the specific economic environment in China over recent decades may also pose an additional difficulty in estimating parental lifetime income. Due to rapid economic growth and structural changes that have moved China from an administratively determined wage scheme to a market oriented scheme, the age-earnings profile and the returns to particular demographic characteristics have shifted markedly. Figure 1 presents the changes in age-earnings profiles over the period 1988-2007. Figure 1a depicts the log of average real annual earnings for each particular birth cohort as they age. The different lines are for different birth cohorts, starting with those born between 1970-75 (aged 20-25 in 1995) and ending with people born between 1935-39 (aged 56-60 in 1995). This figure may be read in two ways. In comparing different birth cohorts at a given age, it shows earnings growth across cohorts while holding age constant. We find that at the same age, the real earnings for different cohorts changed dramatically. For example, at age 40 those who were born in 1960-64 earned about 50 percent more than those born in 1950-54 earned when they were the same age. Alternatively, we can also follow the trajectory of a single line and this shows the age-earnings profile for different birth cohorts. If the age-earnings profile in China had remained constant, one would expect to see the lines remaining parallel to one another. Instead, it is evident that earnings growth has affected

the wage profile differentially for different cohorts. For example, for those born in 1950-54 the profile did not flatten out until age 50, whereas for those born between 1960-64, the profile started to flatten out when they turned 38.

Another way to illustrate the same point is to look at age-earnings profiles over time. Figure 1b takes the average real earnings ratios for each age between 1988 and 1995, 1995 and 2000, and 2000 and 2007. When there is no change in the shape of the age-earnings profile, the graph should show horizontal lines. Figure 1b indicates that between 1988 and 1995, real earnings rose for workers in their 30s, but fell for workers in their 60s. This was partly reversed between 1995 and 2000 (when workers in their 50s and 60s enjoyed the most rapid earnings growth). In the period 2000-2007, prime-aged workers again experienced more rapid growth in real earnings than their older and younger counterparts).

Figure 2 reproduces the partial and marginal  $R^2$ s of age, education, provincial dummy variables, industry and occupation in the earnings equations over the same period from Meng, Shen, and Xue (2009). The changes in the importance of age and provincial dummy variables in explaining earnings variation overtime is striking. At the beginning of the period, around one-quarter of the variation in earnings could be explained by age and its squared term alone, while at the end of the period a quadratic in age explained just 2 per cent. Similarly, the impact of provincial dummy variables doubled from about 10 percent to 20 percent between the late 1980s and the mid 1990s, before declining to its original level in the 2000s. Education, on the other hand, explained less than 3 per cent of the variation in earnings at the beginning of the period, but over 10 per cent at the end of the period.

Given the significant changes in the shape of the age-earnings profiles as well as the changing returns to demographics, it is even more problematic to assume that a single year of income can be used to proxy parents' permanent income in urban China. In this paper we address these problems using the following strategies.

First, we use OLS to estimate Equation (2) with a sample of child-parent pairs where both parent and child are working in 2004. We restrict the age range for children



and parents to an interval where current earnings are the best proxy for long-run earnings (we also experiment with varying this age range).<sup>12</sup>

Second, aiming to address the potential downward bias caused by mis-measurement of parental income, we instrument reported parental income with parental education, occupation, and employment industry. This method, however, may suffer from certain weaknesses. If the rate of return to human capital changes significantly over time, as has occurred in China (Meng and Kidd, 1997; Zhang, Zhao, Park, and Song, 2005; and Meng, Shen, and Xue, 2009), we will mis-estimate the different cohorts' lifetime income. Another problem is that parental education may have an independent effect on children's income (Solon, 1992). For example, nepotism in the Chinese university admissions process might lead us to overestimate the true intergenerational income elasticity if we instrument using parental education. Similarly, nepotism in the Chinese job market might lead us to overestimate the true intergenerational income elasticity if we instrument using parental occupation.

Thus, to avoid these drawbacks associated with using single year parental income data instrumented by their education, occupation, and industry, we adopt a third method of Two-Sample Two-Stage-Least-Squares (TS2SLS) following Arellano and Meghir (1992), Angrist and Krueger (1992), Bjorklund and Jantti (1997), Mocetti (2007), and Nicoletti and Ermisch (2007). To implement the TS2SLS, we use a cross-sectional survey (UHEES 2004) containing information on both children's and parents' current income, education, and demographics. We then combine this with repeated cross-sectional data covering a two-decade period, and include information about parental pseudo-cohorts' earnings, education, occupation, and actual labour market experience. We predict parental permanent income using the latter data source, hoping that it will allow us to better proxy parental permanent income over a period of significant income changes.

More precisely, we use the repeated cross-section sample to estimate the following equation separately for each gender and year over the period 1986-2004:

$$y_i = \alpha + \beta X_i + \eta P o_i + v_i \quad (3)$$

<sup>12</sup> Although we are guided in this analysis by the work of Haider and Solon (2006), their empirical analysis uses U.S. data, and therefore considers an economy with a relatively stable wage growth and age-earnings profile. The situation for China is different. As indicated in Figure 1a, over time the age-earnings profile has changed markedly, with 30-45 year olds experiencing more rapid wage increases than other age groups.

where  $y_{it}$  is the log of observed real income (deflated by province-specific price indices) for individuals who are of working age (men aged 16 to 60 and women aged 16 to 55) and working in year  $t$ . In Equation (3),  $X_{it}$  is a vector of individual characteristics including years of schooling, (occupation and industry of employment), actual age and its square term in year  $t$ , while  $Prov_{it}$  is a vector of provincial dummies. Since the second stage equation also includes parental age and a vector of provincial dummies, the excluded instrument is parental education (occupation, and industry of employment).

Based on the estimated coefficients from Equation (3) and parental demographics from the survey that contain information on parents and children, we then predict parental income year by year for the period 1987-2004.<sup>13</sup> After doing so, we calculate each parent's average earnings taking away the time trend. Only the sample of individuals who have at least five consecutive years of predicted parental income are included.

In addition to the benefit of better capturing parental permanent income, this method also significantly increases the number of observations with both children and parental incomes. However, this method may nonetheless fail to satisfy the exclusion restriction. This should be borne in mind when interpreting our results.

### **3. Data and Summary Statistics**

The data used for this study are from two sources: the Urban Household Education and Employment Survey 2004 (UHEES) and the Urban Household Income and Expenditure Survey 1987-2004 (UHIES). The first survey was conducted jointly by the National Bureau of Statistics (NBS) and Beijing University while the second was conducted by NBS.<sup>14</sup>

<sup>13</sup> The age of the parents for the year  $t-n$  for the prediction is calculated by  $(A_{t-n} = A_t - n)$ . Because we have information from the parent-child dataset (UHEES 2004) on the exact year in which parents started work and retired, we are able to predict parental income in each of the 19 years for those who were working at that time. For parents who started the first job or retired during the 1986-2004 period, their predicted income is set to missing for the period before they started working and after they retired.

<sup>14</sup> The UHIES is a nationwide survey (31 provinces) but due to confidentiality restrictions, we have access to data for only 16 provinces. There are 12 provinces included in the UHEES survey (Beijing, Shanxi, Liaoning, Heilongjiang, Zhejiang, Anhui, Hubei, Guangdong, Sichuan, Guizhou, Shaanxi, and Gansu). When using UHIES to estimate earnings equations as a base for predicted parental earnings, we use data for all 16 provinces we have access to (not just the 12 in the UHEES).

The 2004 UHEES collected detailed information on demographic characteristics, educational attainment, labour market status, labour market history, party membership, annual income, and annual earnings in 2004 for all household members residing in the household *as well as non-residing parents of the household head and his or her spouse*.<sup>15</sup> The fact that the UHEES also surveys non-resident parents makes it particularly well-suited to our empirical analysis. For parents who are retired or deceased, the survey records their last occupation and industry. The 2004 UHEES covers 9,994 urban households and 67,132 individuals, and the information on non-residing parents is reported by their children.<sup>16</sup> The UHIES is a repeated cross-section data for the years 1987-2004, which we use to predict parental permanent income. It includes information on household income, as well as individuals' age, gender, education, occupation and industry.<sup>17</sup>

The UHEES data can be reorganized into child-parent pairs, where each pair includes individual information for children and parents. There are two different kinds of children in the sample. Some are children residing in their parents' home where a parent is the household head (we call these the 'parent-headed sample'). Another group are children residing in their own home (we call these the 'child-headed sample').

Unsurprisingly, these samples have a different age distribution, with both children and parents being much younger in the parent-headed sample than in the child-headed sample (see Figure 3). The child-headed sample on average has a higher income level for children and slightly lower income level for parents than does parent-headed sample. The mean income for children in parent-headed and child-headed samples is 13,195 and 15,457 yuan, respectively, with the t-ratio for the difference being 0.80 (and therefore not statistically significant at conventional levels). The mean income for parents in the two samples is 17,706 and 17,313 yuan, respectively and the t-ratio for the difference is 0.13 (also statistically insignificant at conventional levels). We hope that combining the two

<sup>15</sup> However, non-residing children of the household head and spouse are not surveyed.

<sup>16</sup> Note that because information on non-residing parents is reported by their children, these data may be noisier than the data on residing parents. To the extent that the intergenerational income mobility may differ between the two types of households our estimates may be biased and our interpretation of the results should be treated with caution.

<sup>17</sup> For detailed description of the UHIES data, see Meng, Gong, and Wang, 2009.

samples will give us a sample of parents and children who are reasonably representative of the general population.

The UHEES data includes 28,729 child-parent pairs. Excluding pairs with children younger than 16 or currently at school, and those with an intergenerational age difference below 14 years, there are 18,596 child-parent pairs. We further restrict our sample to those who are working, have a positive income in 2004, and with a father no older than 74 in 2004, and a mother no older than 69 in 2004.<sup>18</sup> With these further restrictions and excluding missing values and very few outliers, 5,475 child-father and 3431 child-mother pairs remain in the sample.<sup>19</sup> For some of our specifications, we restrict the sample to those where both parent and child are within the working-age range and were working in 2004, and with non-missing income data. This further reduces the sample size to 1,813.<sup>20,21</sup>

The summary statistics of children's and parents' ages, years of education, income, and earnings are reported in Table 1.<sup>22</sup> The top panel reports all child-parent pairs in our UHEES sample, while the lower panel reports the sample in which both children and parents are working in 2004. Below we only discuss in detail the bottom panel results, where children are between 17 and 41 years old, fathers between 39 and 60 and mothers between 37 and 55. The average age is approximately 26 for children, 54 for fathers and 50 for mothers. Slightly more than half of the sample children are males. The average

<sup>18</sup> This is because when using UHIES data to predict for parental earnings, we restrict for each year that father's and mother's age is no greater than 60 and 55, respectively, and they should have at least 5 years of predicted earnings to be included in the sample. The earliest data we have for UHIES is 1987 and in order to have at least 5 years of predicted earnings the parents have to be no older than 60 or 55 in 1990 (no older than 74 and 69 in 2004).

<sup>19</sup> This is the sample used in Table 3A. Summing across the four combinations (father-son, father-daughter, mother-son, mother-daughter), the sample size is  $2813+2662+1734+1697=8906$ .

<sup>20</sup> This is the sample used in Table 2. Summing across the four combinations (father-son, father-daughter, mother-son, mother-daughter), the sample size is  $646+313+592+262=1813$ .

<sup>21</sup> It is noticeable that while UHEES data have the greater advantage of recording both co-residing and non-residing parents and the sample size is generally quite large (nearly 10,000 households), once all the restrictions on data are in place, the remaining sample size of child-parent pairs who were both working at the time of the survey becomes quite small (1813 pairs). This raises an issue of representativeness of our results and we acknowledge the potential drawback when interpreting the results using this small sample. However, when applying the TS2SLS method to predict for parental permanent income, many parents who were excluded as a result of not working at the time of the survey are re-included in the sample and our final sample of child-parent pairs using TS2SLS is quite large (8906 pairs) and the estimated results from this sample should represent the general situation.

<sup>22</sup> The incomes in this study are in 2004 prices, based on provincial urban CPI indices.

number of years of schooling is about 13.5 for children and 10 for parents. The table also shows that (conditional on working) fathers have the highest income and earnings on average, followed by children and then mothers.

Relative to the full sample, the sample with both children and parents working (lower panel of Table 1) has on average younger children (27 vs. 34) and parents (54 vs. 62). Nevertheless, the gender composition and average years of schooling do not differ across the two samples. With regard to actual income, children in the total sample on average have a higher income than children from the restricted sample. We do not compare current income for parents across the two samples as many parents from the total sample were no longer working at the time of the survey.

#### **4. Estimated Intergenerational Income Elasticity**

The intergenerational income elasticity is estimated using Equation (2) for father-son, father-daughter, mother-son and mother-daughter, and for the different age groups of children separately. We use the three different methods discussed in Section 2. The results from the first method (OLS using just the 2004 UHEES) are presented in panel A of Table 2. Controlling for child and parent age and their square terms, we estimate a father-son income elasticity of 0.24.<sup>23</sup> If we exclude provincial dummy variables from the regression, the estimated elasticities are slightly higher in all cases. A similar pattern is found for father-daughter, mother-son, and mother-daughter elasticities. In general, the parent-son elasticities are higher than the parent-daughter elasticities.<sup>24</sup> For the sample of all children, the R-squared statistics range between 0.25 and 0.35, suggesting that parental income and the other demographic controls in our regression can explain up to one-third of the variation in children's incomes. (Note that we do not report the R-

<sup>23</sup> Restricting children's age to above 23 and further to above 30, the elasticities increase to 0.25 and 0.32, respectively. However, when we restrict the sample to children aged 30 and above, we have relatively few observations with which to estimate mother-son and mother-daughter elasticities and the resulting income elasticities are not precisely estimated. Therefore, these results are not reported in the table.

<sup>24</sup> Some caution, though, is needed in interpreting the results for mother-son, mother-daughter, and father-daughter pairs due to a lower labour force participation rate for females, and hence higher level of sample selection for them when the estimation only includes individuals with positive incomes. If there is a systematic difference in family background between women who participate in the labour market with their counterparts who do not, estimation only include participants might bias the estimated intergenerational income elasticity estimated when women (mother or daughter) are involved.

squared in subsequent specifications, since it is not a particularly meaningful statistic in instrumental variable regressions.)

Panels B to D of Table 2 present the results using one cross-sectional survey (the 2004 UHEES), but instrumenting parental income using parental demographics. Specifically we use three different combinations of instruments: education only, education and occupation, and education, occupation and industry. The estimated elasticities increase somewhat, but the general pattern does not change much. Again, given that the sample size in the mother-son and mother-daughter samples is extremely small, plus the possible sample selection problem mentioned above, we do not place much weight on these estimated intergenerational elasticities.

We then move on to use predicted parental income from the UHIES data to estimate Equation (2). Before we do so, we report some basic statistics of the predictions of the parental permanent income and examine briefly the relationship between predicted parental permanent income and their observed income in 2004 for a sample of parents who are working in 2004 and have reported a positive income.

Based on data availability, on average fathers' permanent incomes are predicted using 13 years of data, while mothers' permanent incomes are predicted using 12 years of income data. Figure 4 shows the distribution of the number of years' income used in this analysis. Only 5 per cent of the sample has five or fewer years of income data, while many have 10 years or more. These data should give us a fairly good measure of the permanent income. As shown by Mazumder (2005), including more years of data reduces the downward bias due to persistent transitory shocks and corrects for the age-related errors-in-variables bias. In addition, as discussed in Section 2, there have been significant changes in the earnings levels and earnings determination mechanism. Using average predicted earnings from repeated cross-sectional data for the past 18 years helps account for the non-linear impact of these changes in earnings, thereby helping to reduce errors-in-variables bias.

We then examine the relationship between predicted parental permanent incomes and their reported income in 2004 for a group of parents who were working in 2004 and had positive income. Figure 5 shows a strong positive relationship between log of current

and predicted permanent income (the correlation coefficient is 0.46 for fathers and 0.55 for mothers). In Figure 6, we plot the difference between the current income and predicted permanent income for both mothers and fathers and find only a modest difference between current and permanent incomes. For both fathers and mothers, the standard deviation of the difference is about 0.6, suggesting that for two-thirds of respondents, the difference between their permanent and current incomes is less than 60 log points (about 80 percent). This is a larger gap than one would expect to observe in a developed nation, and can be explained by the rapid changes in the Chinese labor market over recent decades, which (as noted above) have had quite differential impacts across the working-age population.

Having examined the reliability of the predicted permanent income data for parents, we use these data to estimate Equation (2) and report the results in Table 3. Columns 1 to 4 in panels A and B of Table 3 show father-child and mother-child intergenerational income elasticities for different age groups of children, while column 5 restricts the sample to individuals whose fathers were working in 2004. Thus, the permanent income elasticities reported in column 5 are essentially comparable to the current income elasticities reported in Table 2 (which use current year reported incomes for both children and parents); in particular, the results reported in Panel D of Table 2 where parental education, occupation, and industry are used as the instruments.<sup>25</sup>

The father-son income elasticities estimated using predicted permanent fathers' incomes are double those estimated using current year reported income. For example, for the total sample the OLS estimated intergenerational income elasticity using 2004 current income is 0.24 (Table 2, Panel A, column 1). Instrumenting fathers' income with education, occupation, and industry, the elasticity is 0.25 (Table 2, Panel D, column 1). However, if we use fathers' predicted *permanent* income with the same instruments, the intergenerational elasticity for the same sample (in which both parents and children

<sup>25</sup> The sample sizes in Table 2 are slightly smaller than those shown in column 5 of Table 3A, since there are a handful of parents who are working but for whom we do not observe incomes. Dropping these cases makes no substantive difference to the comparison – the elasticity is much higher when we use permanent parental incomes (Table 3) than when we use one-year parental incomes (Table 2).

worked in 2004) rises to 0.47 (column 5 in Panel A of Table 3). For the total sample, the estimated elasticity is even higher at 0.56 (Table 3, Panel A, column 1).<sup>26</sup>

For father-daughter pairs, the increase in elasticity when using fathers' permanent income relative to using fathers' reported income is almost the same as for the father-son pairs. The estimated elasticity increases from the OLS estimate of 0.22 (in column 3, panel A of Table 2), to the IV estimate of 0.23 (column 3, panel D of Table 2), and to the Two-Sample-Two-Stage-Least-Squared (TS2SLS) estimate of 0.42 (column 5 in the bottom part of panel A of Table 3). If we consider the total sample, the estimated father-daughter elasticity using predicted fathers' permanent income is even higher at 0.79. For mother-son and mother-daughter pairs, the increase in estimated elasticities from using mothers' permanent income is not as large as for father-son and father-daughter pairs, but the general pattern is consistent. These results, however, suffer more from the sample selection problems due to the lower labour force participation of women (and hence are less reliable).

Our preferred specification restricts the sample to children aged 30-42 (to account for lifecycle bias), and uses parental predicted permanent income. The estimated elasticities for the total sample in this specification are 0.63 for father-son, 0.97 for father-daughter, 0.36 for mother-son, and 0.64 for mother-daughter.

The above results use predicted parental permanent income with education, occupation, and industry as the instruments, and including provincial dummies. We also estimated the same regressions without provincial controls. These results are reported in Appendix A. We find that excluding provincial dummy variables results in slightly higher intergenerational income elasticities across the board.

We also estimate the same regressions using predicted parental permanent income with different combinations of education, occupation, and industry variables as the

<sup>26</sup> The results in column 1 of Table 3 and those reported in column 5 are from two different samples. The results reported in column 1 are for the total sample, while those reported in column 5 are for the sample of people where both parent and child were working at the time of the survey in 2004. Obviously, the sample with both parent and child working in 2004 is a special group of the total sample because the children in that subsample were old to be working (instead of being at school) and the parents were young enough to not be retired. The intergenerational income elasticity for the subsample group is lower than that found for the total sample. This may be related to the fact that the children in this subsample were relatively new to the labour market and their earnings level had not reached their lifetime permanent level.



instruments. The results are quite similar to those obtained in Table 3. In general, using education alone as the instrument results in slightly higher intergenerational elasticity estimates. In attempting to see what explains the difference, we found that the unconditional correlation between child income and parental income is very similar using either instrument set (see Appendix B for the comparison of the unconditional relationships). Only when we introduce regional dummy variables into the regression do the estimates diverge. Our conjecture is that perhaps within a particular region there is more income variation across education levels than across occupation/industry groups. Put another way, within a particular region, education is a better predictor of income than are occupation and industry.

Finally we check to see whether restricting the sample to children whose parents have at least ten years (instead of five years), predicted permanent income affects our results. We find that when we change the sample in this way, the estimated intergenerational income elasticities increase slightly. For example, the estimated father-son elasticity for the total sample is 0.56 while for the restricted sample it increases to 0.61.<sup>27</sup>

Our findings are quite consistent with the literature, which shows that the longer the period used to generate parental permanent income, the lower the attenuation bias and the larger the estimated intergenerational income elasticity. For example, Mazumder (2005) finds that using two year average data for the US the estimated intergenerational elasticity is 0.25 for father-son pairs. It rises to 0.61 when using 16 years' of father's earnings, an increase of 144 per cent. Mazumder (2005) attributes the higher estimate to two factors: first, it reduces the downward bias that stems from transitory shocks, and, second, it corrects for age-related errors-in-variables bias.

Cross-country comparison of intergenerational income mobility is hampered by the fact that different studies use a variety of empirical methods, and observe children at different ages. The father-son intergenerational income elasticity is the measure most commonly reported in the literature. Table 4 compares our results with some recent

<sup>27</sup> These results are available upon request from the authors.

estimates of intergenerational elasticities (most are for fathers and sons, but some are for other family combinations).

Comparing our TS2SLS results for sons aged 30 to 42 with the studies that use similar methods (either IV or TS2SLS) and restrict children to those aged in their thirties and forties, we find that our estimated father-son intergenerational income elasticity in urban China (0.63 with control for provincial variables and 0.66 without such a control) is at the upper end of the range of estimates for other countries. For example, the estimated elasticity is 0.22 for Canada (Fortin and Lefebvre, 1998), about 0.25 for Australia (Leigh, 2007), 0.25 for Japan (Lefranc, Ojima, and Yoshida, 2008), 0.28 for Sweden (Bjorklund and Jantti, 1997), 0.41–0.49 for France (leFranc and Trannoy, 2005 and Lefranc, Ojima, and Yoshida, 2008), 0.44 for Italy (Mocetti, 2007), and 0.40–0.6 for the United States (Solon, 1992; Mazumder, 2005).<sup>28</sup> Relative to other Asian countries, our estimate for China is also at the high end. For example, Lefranc *et. al.* (2008) estimate intergenerational income elasticities of 0.25 for Japan, while the estimate of Ng (2007) for Singapore's parent-child income elasticity is 0.28.<sup>29</sup> These comparisons, however, requires a further note of caution. Country studies might differ significantly depending on the sample selection rules, characteristics of the population considered, reliability of the earnings measure, and the instrument set used.

Our analysis demonstrates the importance of obtaining a measure of permanent income, and accounting for lifecycle bias, especially in an economy where the wage structure has changed significantly. If we use single-year income measures for parents, we obtain substantially lower estimates of the intergenerational income elasticity for urban China (indeed, such estimates imply that urban China is an extremely socially mobile country). However, when we use predicted permanent incomes, and restrict the sample of children to those aged 30-42 (to account for lifecycle bias), we obtain intergenerational elasticities that are sometimes twice as large.

<sup>28</sup> There are too few studies of father-daughter, mother-son, and mother-daughter elasticities to draw strong conclusions about how our results compare with those for other countries. However, given that these elasticities tend to be highly correlated within countries, it seems reasonable to conclude that urban China is relatively socially immobile for women as well as men.

<sup>29</sup> Other studies on Asian countries, such as Grawe (2004), use samples with younger aged children and hence are less comparable. Nevertheless, we have listed them in Table 4.

It is worth noting that (in common with some other studies) we present only intergenerational elasticities, and do not calculate intergenerational *correlations*. The relationship between the elasticity and the correlation is  $\rho = \beta \frac{\sigma_p}{\sigma_c}$ , where  $\beta$  is the elasticity,  $\sigma_p$  and  $\sigma_c$  are the standard deviations of log income in the parents' generation and the children's generation, respectively. To calculate  $\rho$  would require information on the underlying variance in permanent incomes. However, given that income inequality in urban China (measured by annual incomes) has risen markedly over recent decades, it is likely that inequality of permanent incomes has also risen. Since permanent income is likely to be more dispersed in the 2000s than in the 1980s, it is probable that the intergenerational income correlation in urban China would be *lower* than the intergenerational income elasticity.

## **5. How Is Income Earning Ability Transmitted Across Generations?**

In this section, we analyze how income-earning ability is transferred across generations in urban China, focusing particularly on the role of education, party membership, occupation and industry.

Education is believed to be a significant pathway for intergenerational transmission for many countries.<sup>30</sup> Using our full sample, we therefore estimate intergenerational educational transmission by both schooling years and by three categories of educational attainment: (1) lower secondary schooling or less; (2) upper secondary schooling; (3) college and above.

Table 5 cross-tabulates the education level of parents and children. The first row of Panels A and B present the educational distribution of the children. In the total sample, 28 percent of sons have lower secondary schooling or less, 34 percent have upper secondary schooling, and 38 percent have a college degree. Panel C presents parent-child correlations. Depending on which combination we look at (father-son, father-daughter,

<sup>30</sup> For instance, when education is not subsidized, rich parents can invest more in their children's education than can poor parents. Subsidized education can be a way of equalizing opportunities for poor children (Eide and Showalter, 1999; Ng, 2007).

mother-son, or mother-daughter), between 44 and 49 percent of children are in the same education category as their parents. Measured in years of schooling rather than categorically, the correlation coefficient between parents' and children's education ranges from 0.22 for mothers and sons to 0.38 for mothers and daughters (see the bottom panel of Table 4).<sup>31</sup> Among fathers who have a college degree, 62 percent of their sons have a college degree. Among mothers with a college degree, 65 percent of their sons have a college degree. A similar pattern can be observed for daughters.

Figure 7 presents the estimated relationship between parents' and children's schooling years by children's birth year and gender, with the sample restricted to children aged 25 years or older (since respondents aged less than 25 are more likely to be in the process of completing their education). The chart shows that the intergenerational association of schooling is approximately three times higher for children born in the late-1970s than for children born in the early-1950s. This increase can be explained partly by the end of the Chinese Cultural Revolution in 1976, followed by the restoration of the University Entrance Examinations in 1977. For children born after 1960, this increased the gap in educational attainment between those with higher-educated parents and those with less-educated parents (Meng and Gregory, 2002).

By international standards, the intergenerational education correlation in urban China is relatively low (compare our results with Hertz *et al.*, 2007). There are two main reasons for the low correlation. First, because the Cultural Revolution reduced education levels for an entire cohort, there was a disconnection between parental and children's education for cohorts where either parents or children were young adults during the Cultural Revolution. Second, average levels of educational attainment have risen considerably since the late 1990s.

Parents' social networks can play an important role in providing their children with access to better opportunities in education and the labor market (Lin and Bian, 1991; Walder, Li and Treiman, 2000; Meng, 2007). Communist Party membership can be transferred across generations through parental role models and social networks.

<sup>31</sup> These coefficients of correlation are similar to those estimated for rural China by Hertz *et al.* (2007).

The intergenerational transmission of occupations and industries is more complicated. It depends on whether the parental social network plays an important role in children's entrance to the labor market and their promotion in the workplace; whether there are entry barriers due to crafts, professional and technical skills that are handed down; whether the attitudes and norms of family ties differ between rich and poor parents; and whether cohabitation with parents strengthens intergenerational persistence through the effects on beliefs and preferences (Mocetti, 2007).

Table 6 reports the persistence matrices of Communist Party membership, occupation, and sector of employment between children and parents by gender using the total sample. The first panel of Table 6 shows that if the parents are party members, their children are 4–10 percentage points more likely to be party members (for sons, this represents about a 10-20 percent increase in the probability of joining the party, while for daughters it represents more than a 50 percent increase in the probability of Party membership).

The second panel indicates a very strong persistence in occupation between children and parents. If fathers or mothers are working in the occupational category *professionals and technicians*, their children are 35-40 percentage points more likely to also be working in this occupation than those whose parents are not (this represents a near-tripling in the probability of being in this occupational category). The differences for *administration staff* are 17-23 percentage points (approximately a doubling in the probability), while for *production and transportation workers* the differences are 16-30 percentage points (having a father who was a production worker approximately triples the probability that a child will enter this occupational grouping, while having a mother who was a production worker doubles the probability).

The third panel of Table 6 presents the proportions of sons and daughters working in the state-owned sector based on whether their fathers and mothers also work in that sector. Seventy-one percent of sons and 67 percent of daughters work in the state-owned sector. Children are 6-9 percentage points (about 10 percent) more likely to work in the state-owned sector if one of their parents also worked in that sector.

Following Hertz (2008) we also conduct a decomposition to see whether income mobility is higher for children whose fathers are party members than for those whose fathers are not in the Party. We find that the within-group elasticities and persistence for those whose fathers are party members are 0.40 and 0.37, respectively. For those whose fathers are not party members, the elasticities and persistence are 0.69 and 0.81, respectively. These results indicate that within-group mobility is much higher for those whose fathers are party members than those whose fathers are not (and conversely that intergenerational persistence is lower).<sup>32</sup>

Finally, we re-estimate intergenerational income elasticities as those reported in Table 3, but this time controlling for children's education, party membership, occupation and industry individually and together. The results are reported in Table 7. Using the sample of children aged 30 to 42 as the baseline results, we find that if we include the education level of the child into the regression, the estimated intergenerational income elasticity for father-son reduces from 0.63 to 0.27, for mother-son, father-daughter, and mother-daughter the reductions are from 0.36 to 0.12, 0.97 to 0.55, and 0.64 to 0.35, respectively (compare these results with estimates in column 4 of Table 3).

Including children's occupation also reduces the intergenerational elasticities by a large amount but not as much as the effect of education. The effect of party membership and industry of employment have an even smaller impact. Even though these tests are somewhat crude, they seem to suggest that the most important channel through which intergenerational income transmission takes place is education.

## **6. Conclusions**

An old Chinese saying holds that families will “be poor no more than three generations and be rich no more than three generations”.<sup>33</sup> This suggests that in China, as in many nations, there is a strong popular belief in social mobility. Our findings challenge this view. At least for modern-day urban China, we find a strikingly low level of intergenerational mobility. Our preferred estimates show that the intergenerational

<sup>32</sup> After adjusting for the between-group effect the persistence changes very slightly. These results are available upon request from the authors.

<sup>33</sup> “Qiong bu guo san dai, fu bu guo san dai”.

income elasticities are 0.63 for father-son, 0.97 for father-daughter, 0.36 for mother-son, and 0.64 for mother-daughter. Internationally, our estimated father-son elasticity places urban China among the least socially mobile places in the world.

Exploring possible pathways, we find that education, especially college study, is one channel through which earnings ability is transmitted from parents to children (though the intergenerational association of education is still lower in urban China than in many other nations). We also estimate intergenerational correlations for parental party membership, occupation, and industry. The intergenerational occupational correlation is particularly high, suggesting that occupation may be an important channel through which intergenerational transmission occurs in urban China. However, it is also possible that factors we do not perfectly observe in our data – such as genes, health, or social networks – are also significant explanators of intergenerational transmission in urban China.

The fact that we find the main channel for intergenerational income transmission is through education has important policy implication. The very low income mobility in current day urban China may reflect a substantial inequality in education. Although the topic is beyond the scope of this paper, it points us to a future research area.

Finally, we would like to further point out that our study focuses only on urban China. Given the large income gap and significant institutional difference between rural and urban China, our results may not generalize to the whole country. However, from a policy perspective, our estimated elasticity is still an important parameter. The large scale rural-urban migration which is occurring in China offers the potential for upwards social mobility for those born in rural areas. It may at the same time create the possibility for downwards social mobility for those born in urban areas.

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**Table 1: Summary Statistics, UHEE 2004**

| Total Sample  | Individuals | Father-child |                  | Mother-child |                  |
|---|-------------|--------------|------------------|--------------|------------------|
|   |             | Age range    |                  | Age range    |                  |
|   | Children    | 17-56        |                  | 17-53        |                  |
|   | Parents     | 38-73        |                  | 37-68        |                  |
| Age   | Children    | 34.16        | 7.14             | 31.75        | 6.76             |
|   | Parents     | 62.3         | 7.02             | 57.34        | 6.28             |
| Males   | Children    | 0.51         |                  | 0.50         |                  |
| Years of schooling                                    | Children    | 13.15        | 2.31             | 13.46        | 2.18             |
|   | Parents     | 10.06        | 2.31             | 9.88         | 3.64             |
| Annual income   | Children    | 15455        | 12782            | 15613        | 12930            |
| Predicted average annual income between 1986 and 2004 | Parents     | 7628         | 2295             | 6000         | 2199             |
| No. of pairs  |             | 5475         |                  | 3431         |                  |
| <b>Sample with both children and parents working</b>  |             | Children     | 17-41            | 17-39        |                  |
|   | Parents     | 39-60        |                  | 37-55        |                  |
|   |             | <b>Mean</b>  | <b>Std. Dev.</b> | <b>Mean</b>  | <b>Std. Dev.</b> |
| Age   | Children    | 26.51        | 3.91             | 24.94        | 3.25             |
|   | Parents     | 53.76        | 3.79             | 49.98        | 3.38             |
| Males   | Children    | 0.52         |                  | 0.54         |                  |
| Years of schooling                                    | Children    | 13.4         | 2.56             | 13.37        | 2.53             |
|   | Parents     | 10.24        | 2.96             | 9.98         | 2.73             |
| Annual income   | Children    | 14067        | 13155            | 13441        | 13643            |
|   | Parents     | 17642        | 13513            | 13849        | 10801            |
| Annual earnings                                       | Children    | 13634        | 12593            | 13173        | 13235            |
|   | Parents     | 16903        | 12235            | 13372        | 10687            |
| No. of pairs  |             | 1238         |                  | 507          |                  |

**Table 2: Intergenerational Income Elasticities Using Current Incomes**

|  | <u>Sons</u>          |                      | <u>Daughters</u>        |                         |
|--|----------------------|----------------------|-------------------------|-------------------------|
| <b>Panel A: OLS</b>  | <b>Father-Son</b>    | <b>Mother-Son</b>    | <b>Father-Daughter</b>  | <b>Mother-Daughter</b>  |
| Log(parents' income)   | 0.241<br>[0.0330]*** | 0.302<br>[0.0840]*** | 0.215<br>[0.0458]***    | 0.174<br>[0.0689]**     |
| Observations   | 646                  | 313                  | 592                     | 262                     |
| R-squared  | 0.301                | 0.348                | 0.254                   | 0.303                   |
| Children's age range   | 17-39                | 17-39                | 17-41                   | 17-43                   |
| Father's age range   | 39-60                | 37-55                | 42-60                   | 40-55                   |
| <b>Panel B: IV=education</b>                                 | <b><u>Sons</u></b>   | <b><u>Sons</u></b>   | <b><u>Daughters</u></b> | <b><u>Daughters</u></b> |
|  | <b>Father-Son</b>    | <b>Mother-Son</b>    | <b>Father-Daughter</b>  | <b>Mother-Daughter</b>  |
| Log(parents' income)   | 0.346<br>[0.123]***  | 0.451<br>[0.131]***  | 0.301<br>[0.116]***     | 0.355<br>[0.144]**      |
| Observations   | 646                  | 254                  | 592                     | 262                     |
| Children's age range   | 17-39                | 23-43                | 17-42                   | 17-43                   |
| Fathers' age range   | 39-60                | 41-55                | 42-60                   | 40-55                   |
| <b>Panel C: IV=education &amp; occupation</b>                |                      |                      |                         |                         |
| Log(parents' income)   | 0.297<br>[0.123]***  | 0.553<br>[0.122]***  | 0.286<br>[0.099]***     | 0.240<br>[0.107]**      |
| Observations   | 651                  | 317                  | 594                     | 262                     |
| Children's age range   | 17-39                | 17-43                | 17-42                   | 17-43                   |
| Mothers' age range   | 39-60                | 37-55                | 42-60                   | 40-55                   |
| <b>Panel D: IV=education &amp; occupation &amp; industry</b> |                      |                      |                         |                         |
| Log(parents' income)   | 0.251<br>(0.072)***  | 0.424<br>(0.112)***  | 0.229<br>(0.090)**      | 0.189<br>(0.100)*       |
| Observations   | 651                  | 317                  | 594                     | 262                     |
| Children's age range   | 17-39                | 17-43                | 17-42                   | 17-43                   |
| Mothers' age range   | 39-60                | 37-55                | 42-60                   | 40-55                   |

Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Fathers' income and mothers' income are single-year incomes (measured in 2004). Each elasticity is from a separate regression.

R-squared statistics are reported for OLS, but not for IV (since the latter is not a particularly meaningful statistic).

**Table 3: Intergenerational Income Elasticities Using Predicted Parental Permanent Incomes**

|  | All Children        | Aged >=23           | Aged >=30           | Aged 30-42          | Child and parents working in 2004 |
|--|---------------------|---------------------|---------------------|---------------------|-----------------------------------|
| <b>Panel A:</b>                            |                     |                     |                     |                     |                                   |
| <b>Father-son</b>                          |                     |                     |                     |                     |                                   |
| Log(fathers' income) [IV=edu.&occ. & ind.] | 0.563<br>[0.086]*** | 0.549<br>[0.088]*** | 0.654<br>[0.110]*** | 0.634<br>[0.117]*** | 0.468<br>[0.162]***               |
| Observations                               | 2813                | 2721                | 2011                | 1638                | 650                               |
| Children's age range                       | 17-58               | 23-58               | 30-58               | 30-42               | 17-39                             |
| Fathers' age range                         | 38-74               | 40-74               | 48-74               | 48-74               | 39-60                             |
| <b>Father-daughter</b>                     |                     |                     |                     |                     |                                   |
| Log(fathers' income) [IV=edu.&occ. & ind.] | 0.786<br>[0.086]*** | 0.765<br>[0.087]*** | 0.967<br>[0.114]*** | 0.973<br>[0.121]*** | 0.419<br>[0.159]***               |
| Observations                               | 2662                | 2573                | 1896                | 1593                | 595                               |
| Children's age range                       | 17-54               | 23-54               | 30-54               | 30-42               | 17-41                             |
| Fathers' age range                         | 40-74               | 40-74               | 47-74               | 47-74               | 42-60                             |
| <b>Panel B:</b>                            |                     |                     |                     |                     |                                   |
| <b>Mother-son</b>                          |                     |                     |                     |                     |                                   |
| Log(mothers' income) [IV=edu.&occ. & ind.] | 0.356<br>[0.071]*** | 0.350<br>[0.072]*** | 0.366<br>[0.090]*** | 0.357<br>[0.094]*** | 0.567<br>[0.140]***               |
| Observations                               | 1734                | 1648                | 1014                | 909                 | 352                               |
| Children's age range                       | 17-53               | 23-53               | 30-53               | 30-42               | 17-39                             |
| Mothers' age range                         | 37-69               | 41-69               | 49-69               | 49-69               | 37-55                             |
| <b>Mother-daughter</b>                     |                     |                     |                     |                     |                                   |
| Log(mothers' income) [IV=edu.&occ. & ind.] | 0.504<br>[0.077]*** | 0.500<br>[0.078]*** | 0.632<br>[0.103]*** | 0.636<br>[0.106]*** | 0.370<br>[0.169]**                |
| Observations                               | 1697                | 1616                | 1015                | 944                 | 307                               |
| Children's age range                       | 17-50               | 23-50               | 30-50               | 30-42               | 17-38                             |
| Mothers' age range                         | 40-69               | 42-69               | 48-69               | 48-69               | 40-55                             |

Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Father's income and mother's income are permanent incomes (see text for details). Each elasticity is from a separate regression.

**Table 4: Summary of Recent Studies on Intergenerational Income Elasticity for Different Countries**

|                                 | Country                                 | Data year                               | Elasticity                | Children's age            | Parents' age              | Methods         | Authors                      |
|---------------------------------|---|---|---------------------------|---------------------------|---------------------------|-----------------|------------------------------|
| <b>Father-son</b>               | Australia                               | 2004                                    | 0.2-0.3                   | 25-55                     | 40 (assigned)             | IV              | Leigh (2007)                 |
|                                 | Brazil                                  | 1996                                    | 0.80-0.83                 | 30-39                     | 30-50 (in 1976)           | TS2SLS          | Dunn(2007)                   |
|                                 | Brazil                                  | 1996                                    | 0.52-0.58                 | 25-64                     | 34 years older than sons  | TS2SLS          | Ferreira and Veloso (2006)   |
|                                 | Britain                                 | 1991-2003                               | 0.32                      | 31-45                     | N.A.                      | IV              | Nicoletti and Ermisch (2007) |
|                                 | Britain                                 | 1991                                    | 0.56-0.58                 | 33 (mean)                 | 47.5 (mean)               | IV              | Dearden et al. (1997)        |
|                                 | Canada                                  | 1986-1994                               | 0.22                      | 30-39                     | when child aged 15        | IV              | Fortin and Lefebvre (1998)   |
|                                 | Canada                                  | 1998                                    | 0.21                      | 32-35                     | 45.5 (mean)               | OLS             | Corak (2001, 2006)           |
|                                 | China (Urban)                           | 2004                                    | 0.32                      | N.A.                      | N.A.                      | OLS             | Guo and Min (2008)           |
|                                 | Ecuador                                 | 1994                                    | 1.13                      | 24-40                     | 45-60                     | TS2SLS          | Grawe (2001,04)              |
|                                 | France                                  | 1993                                    | 0.41                      | 30-40                     | 55-70                     | TS2SLS          | Lefranc and Trannoy (2005)   |
|                                 | France                                  | 1985-2003                               | 0.50                      | 30-50                     | 40 (assigned)             | TS2SLS          | Lefranc et al (2008)         |
|                                 | Germany                                 | 1984                                    | 0.12                      | 25 (mean)                 | 50-51 (mean)              | OLS             | Couch and Dunn (1997)        |
|                                 | Italy                                   | 2000-2004                               | 0.44                      | 30-45                     | 30-50 (in 1977-1979)      | TS2SLS          | Mocetti (2007)               |
|                                 | Japan                                   | 1985-2005                               | 0.25                      | 30-50                     | 40 (assigned)             | TS2SLS          | Lefranc et al (2008)         |
|                                 | Malaysia                                | 1976/1989                               | 0.54                      | >=23                      | 24-59                     | IV              | Grawe (2004)                 |
|                                 | Nepal                                   | 1995                                    | 0.32                      | 24-40                     | 45-60                     | TS2SLS          | Grawe (2001,04)              |
|                                 | Pakistan                                | 1991                                    | 0.24                      | 25-35                     | 45-60                     | TS2SLS          | Grawe (2001,04)              |
|                                 | Peru                                    | 1985                                    | 0.67                      | 24-40                     | 45-60                     | TS2SLS          | Grawe (2001,04)              |
|                                 | South Africa                            | 1993-1998                               | 0.61                      | 25.1(mean)                | 53.7(mean)                | OLS             | Hertz(2001)                  |
|                                 | Sweden                                  | 1991                                    | 0.28                      | 30-39                     | 43.3 (mean)               | TS2SLS          | Bjorklund and Jantti (1997)  |
|                                 | Sweden                                  | 1992                                    | 0.13                      | 25-51                     | 52                        | OLS             | Osterberg (2001)             |
|                                 | United States                           | 1993                                    | 0.47                      | 28-41                     | 40.2 (mean)               | IV              | Grawe (2004)                 |
|                                 | United States                           | 1981/1984                               | 0.39                      | 14-59                     | N.A.                      | IV              | Altonji and Dunn (2000)      |
|                                 | United States                           | 1984                                    | 0.41                      | 25-33                     | 44 (mean)                 | OLS             | Solon (1992)                 |
|                                 | United States                           | 1984                                    | 0.53                      | 25-33                     | 44 (mean)                 | IV              | Solon (1992)                 |
|                                 | United States                           | 1987                                    | 0.52                      | 28-36                     | 45 (mean)                 | TS2SLS          | Bjorklund and Jantti (1997)  |
| United States                   | 1995-98 for children 1970-85 for father | 0.57                                    | 27-32 (1995) 30-35 (1998) | 13-55 (1970) 27-69 (1984) | TS2SLS                    | Mazumder (2005) |                              |
| <b>Father-daughter</b>          | Canada                                  | 1986-1994                               | 0.22                      | 30-39                     | when child aged 15        | IV              | Fortin and Lefebvre (1998)   |
|                                 | Britain                                 | 1991                                    | 0.64-0.66                 | 33 (mean)                 | 47.5 (mean)               | IV              | Dearden et al. (1997)        |
|                                 | United States                           | 1995-98 for children 1970-85 for father | 0.61                      | 27-32 (1995) 30-35 (1998) | 13-55 (1970) 27-69 (1984) | TS2SLS          | Mazumder (2005)              |
|                                 | United States                           | 1981/1984                               | 0.4                       | 14-59                     | N.A.                      | IV              | Altonji and Dunn (2000)      |
| <b>Mother-son</b>               | United States                           | 1981/1984                               | 0.29                      | 14-59                     | N.A.                      | IV              | Altonji and Dunn (2000)      |
| <b>Mother-daughter</b>          | United States                           | 1981/1984                               | 0.27                      | 14-59                     | N.A.                      | IV              | Altonji and Dunn (2000)      |
|                                 | South Africa                            | 1993-1998                               | 0.66                      | 27.7 (mean)               | 52.4 (mean)               | OLS             | Hertz(2001)                  |
| <b>Parent-child</b>             | Singapore                               | 2002                                    | 0.23                      | 23-29                     | N.A.                      | OLS             | NG (2007)                    |
|                                 |   |   | 0.28                      | 23-29                     | N.A.                      | IV              | NG (2007)                    |
| <b>Parent-married sons</b>      | Japan                                   | 1993-2004                               | 0.41-0.46                 | 36.2 (mean)               | 60.0 (mean)               | IV              | Ueda (2007)                  |
| <b>Parent married daughters</b> | Japan                                   | 1993-2004                               | 0.30-0.38                 | 36.4(mean)                | 57.2 (mean)               | IV              | Ueda (2007)                  |
| <b>Parent single daughters</b>  | Japan                                   | 1993-2004                               | 0.30                      | 27.9 (mean)               | 55.6(mean)                | IV              | Ueda (2007)                  |



**Table 5: Intergenerational Education Correlation**

| Panel A:                                   |                                   | Parents' education | <u>Son's education</u>            |                           |                   |
|--|-----------------------------------|--------------------|-----------------------------------|---------------------------|-------------------|
|  |                                   |                    | Lower secondary schooling or less | Upper secondary schooling | College and above |
| Full sample: % children in each category   |                                   |                    | 27.74                             | 34.12                     | 38.14             |
| Fathers                                    | Lower secondary schooling or less | <b>32.84</b>       | 34.42                             | 48.42                     |                   |
|  | Upper secondary schooling         | 14.23              | <b>37.35</b>                      | 61.96                     |                   |
|  | College and above                 | 10.95              | 27.09                             | <b>61.96</b>              |                   |
| Mothers                                    | Lower secondary schooling or less | <b>30.88</b>       | 34.23                             | 34.89                     |                   |
|  | Upper secondary schooling         | 12.86              | <b>36.17</b>                      | 50.97                     |                   |
|  | College and above                 | 9.5                | 25.7                              | <b>64.8</b>               |                   |
| Panel B:                                   |                                   | Parents' education | <u>Daughter's education</u>       |                           |                   |
|  |                                   |                    | Lower secondary schooling or less | Upper secondary schooling | College study     |
| Full sample: % children in each category   |                                   |                    | 32.53                             | 37.27                     | 30.19             |
| Fathers                                    | Lower secondary schooling or less | <b>38.99</b>       | 37.91                             | 23.1                      |                   |
|  | Upper secondary schooling         | 16.49              | <b>39.72</b>                      | 43.79                     |                   |
|  | College and above                 | 9.28               | 28.31                             | <b>62.41</b>              |                   |
| Mothers                                    | Lower secondary schooling or less | <b>36.99</b>       | 38.09                             | 24.92                     |                   |
|  | Upper secondary schooling         | 10.37              | <b>35.73</b>                      | 53.9                      |                   |
|  | College and above                 | 4.35               | 22.41                             | <b>73.24</b>              |                   |
| Panel C:                                   |                                   | Father-son         | Mother-son                        | Father-daughter           | Mother-daughter   |
| In same educational categories             |                                   | 44.05              | 43.95                             | 47.04                     | 48.65             |
| Correlation coefficient of schooling years |                                   | 0.26               | 0.22                              | 0.37                      | 0.38              |

**Table 6:** Intergenerational Persistence in Party Membership, Occupation and Sector of Employment

| <b>Communist party membership</b>                        |            | Sons     | Daughters |
|--|------------|----------|-----------|
| All  |            | 33.56%   | 18.88%    |
| Fathers  | Yes        | 37.13%   | 25.11%    |
|  | No         | 31.57%   | 15.51%    |
|  | Difference | 5.56 pp  | 9.6 pp    |
| Mothers  | Yes        | 36.85%   | 27.50%    |
|  | No         | 33.14%   | 17.80%    |
|  | Difference | 3.71 pp  | 9.70 pp   |
| <b>Occupation: Professionals and technicians</b>         |            |          |           |
| All  |            | 30.26%   | 29.89%    |
| Fathers  | Yes        | 60.31%   | 56.24%    |
|  | No         | 20.28%   | 20.84%    |
|  | Difference | 40.03 pp | 35.41 pp  |
| Mothers  | Yes        | 59.59%   | 60.61%    |
|  | No         | 24.32%   | 23.35%    |
|  | Difference | 35.27 pp | 37.26 pp  |
| <b>Administrative staff</b>                              |            |          |           |
| All  |            | 22.41%   | 22.36%    |
| Fathers  | Yes        | 40.37%   | 37.83%    |
|  | No         | 18.29%   | 18.85%    |
|  | Difference | 22.09 pp | 18.98 pp  |
| Mothers  | Yes        | 37.87%   | 43.75%    |
|  | No         | 20.92%   | 20.37%    |
|  | Difference | 16.95 pp | 23.38 pp  |
| <b>Production workers</b>                                |            |          |           |
| All  |            | 31.03%   | 24.10%    |
| Fathers  | Yes        | 49.47%   | 41.08%    |
|  | No         | 19.78%   | 14.38%    |
|  | Difference | 29.7 pp  | 26.7 pp   |
| Mothers  | Yes        | 45.06%   | 35.82%    |
|  | No         | 25.82%   | 19.52%    |
|  | Difference | 19.24 pp | 16.30 pp  |
| <b>Sector of Employment: Working in the state sector</b> |            |          |           |
| All  |            | 70.57%   | 66.69%    |
| Fathers  | Yes        | 73.88%   | 71.03%    |
|  | No         | 68.36%   | 63.15%    |
|  | Difference | 5.51 pp  | 7.89 pp   |
| Mothers  | Yes        | 71.93%   | 72.81%    |
|  | No         | 66.40%   | 64.00%    |
|  | Difference | 5.53 pp  | 8.81 pp   |

Note: 'pp' means 'percentage points'

**Table 7: What Explains the Intergenerational Elasticity?**

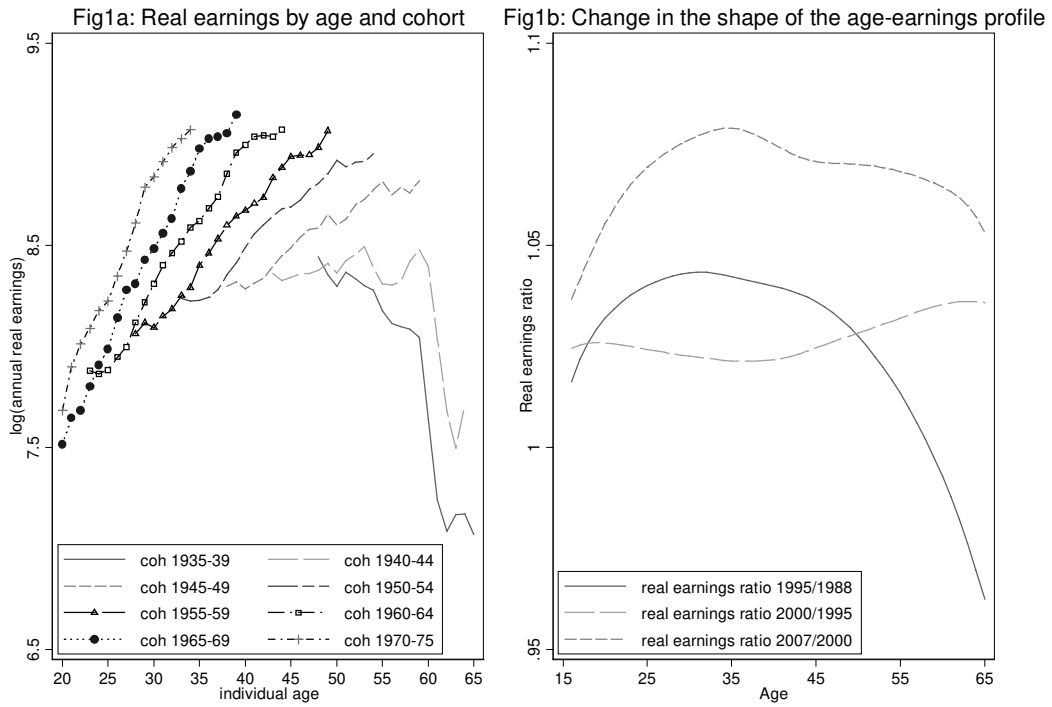
| <b>Panel 1: Father-son</b>             |            |            | <u>Dependent variable: Log (sons' income)</u>      |            |            |            |            |           |
|--|------------|------------|--|------------|------------|------------|------------|-----------|
| Log (father's income) [IV=edu+occ+ind] | 0.634      | 0.272      | 0.555  | 0.316      | 0.442      | 0.267      | 0.165      | 0.138     |
|  | [0.117]*** | [0.117]**  | [0.117]***   | [0.117]*** | [0.120]*** | [0.117]**  | [0.117]    | [0.118]   |
| Education                              |            | Yes        |  |            |            | Yes        | Yes        | Yes       |
| Party                                  |            |            | Yes  |            |            | Yes        | Yes        | Yes       |
| Occupation                             |            |            |  | Yes        |            |            | Yes        | Yes       |
| Sector                                 |            |            |  |            | Yes        |            |            | Yes       |
| Observations                           | 1638       | 1638       | 1637   | 1633       | 1638       | 1637       | 1632       | 1632      |
| R-squared                              | 0.24       | 0.30       | 0.26   | 0.30       | 0.28       | 0.30       | 0.33       | 0.35      |
| <b>Panel 2: Mother-son</b>             |            |            | <u>Dependent variable: Log (sons' income)</u>      |            |            |            |            |           |
| Log (mother's income) [IV=edu+occ+ind] | 0.357      | 0.120      | 0.310  | 0.159      | 0.244      | 0.115      | 0.049      | 0.056     |
|  | [0.094]*** | [0.092]    | [0.094]***   | [0.094]*   | [0.092]*** | [0.092]    | [0.094]    | [0.093]   |
| Education                              |            | Yes        |  |            |            | Yes        | Yes        | Yes       |
| Party                                  |            |            | Yes  |            |            | Yes        | Yes        | Yes       |
| Occupation                             |            |            |  | Yes        |            |            | Yes        | Yes       |
| Sector                                 |            |            |  |            | Yes        |            |            | Yes       |
| Observations                           | 909        | 909        | 909  | 906        | 909        | 909        | 906        | 906       |
| R-squared                              | 0.25       | 0.32       | 0.26   | 0.32       | 0.31       | 0.33       | 0.35       | 0.39      |
| <b>Panel 3: Father-daughter</b>        |            |            | <u>Dependent variable: Log (daughters' income)</u> |            |            |            |            |           |
| Log (father's income) [IV=edu+occ+ind] | 0.973      | 0.551      | 0.922  | 0.552      | 0.593      | 0.550      | 0.388      | 0.288     |
|  | [0.121]*** | [0.121]*** | [0.121]***   | [0.118]*** | [0.121]*** | [0.120]*** | [0.118]*** | [0.117]** |
| Education                              |            | Yes        |  |            |            | Yes        | Yes        | Yes       |
| Party                                  |            |            | Yes  |            |            | Yes        | Yes        | Yes       |
| Occupation                             |            |            |  | Yes        |            |            | Yes        | Yes       |
| Sector                                 |            |            |  |            | Yes        |            |            | Yes       |
| Observations                           | 1593       | 1593       | 1590   | 1582       | 1593       | 1590       | 1579       | 1579      |
| R-squared                              | 0.20       | 0.29       | 0.22   | 0.29       | 0.29       | 0.29       | 0.32       | 0.35      |
| <b>Panel 4: Mother-daughter</b>        |            |            | <u>Dependent variable: Log (daughters' income)</u> |            |            |            |            |           |
| Log (mother's income) [IV=edu+occ+ind] | 0.636      | 0.349      | 0.609  | 0.355      | 0.451      | 0.352      | 0.240      | 0.231     |
|  | [0.106]*** | [0.100]*** | [0.105]***   | [0.104]*** | [0.102]*** | [0.100]*** | [0.101]**  | [0.100]** |
| Education                              |            | Yes        |  |            |            | Yes        | Yes        | Yes       |
| Party                                  |            |            | Yes  |            |            | Yes        | Yes        | Yes       |
| Occupation                             |            |            |  | Yes        |            |            | Yes        | Yes       |
| Sector                                 |            |            |  |            | Yes        |            |            | Yes       |
| Observations                           | 944        | 944        | 944  | 939        | 944        | 944        | 939        | 939       |
| R-squared                              | 0.21       | 0.29       | 0.22   | 0.29       | 0.29       | 0.30       | 0.32       | 0.35      |

Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Note: 1. Parent income is the permanent income of the child's mother or father (see text for details). Each column is a separate regression.

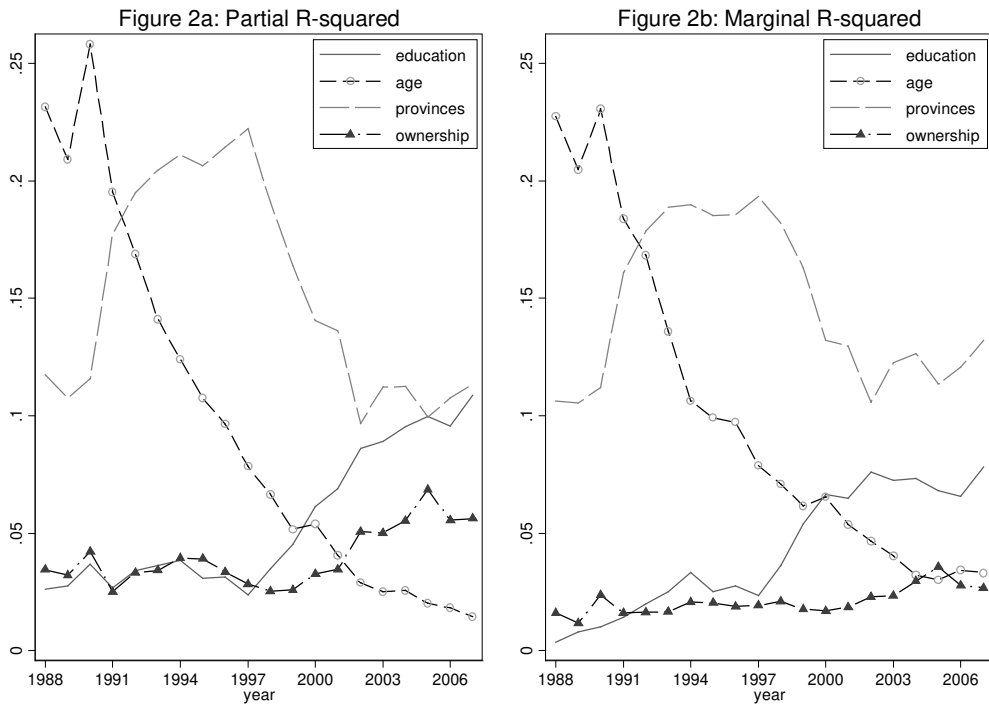
2. Children used are aged 30-42

**Figure 1: Change in the Level And Shape of The Age-Earnings Profile, 1986-2007**



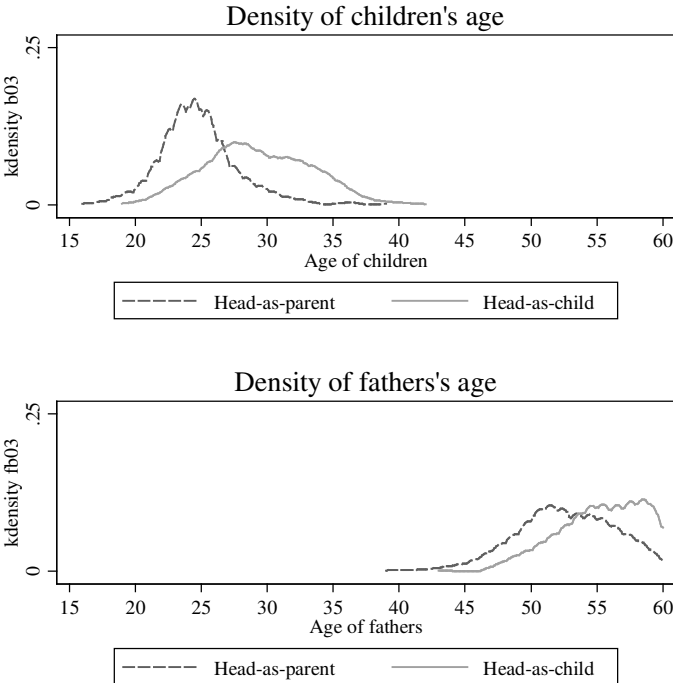
Source: Autrhos' own estimation results

**Figure 2: Changes in Impacts of Different Attributes on Earnings, 1988-2007**



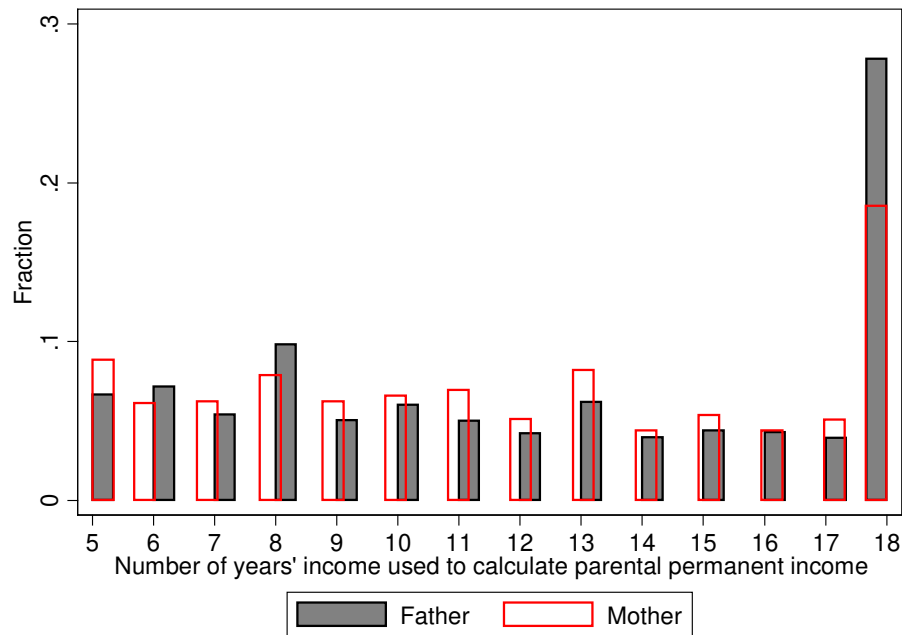
Source: Meng, Shen, and Xue (2009)

**Figure 3: Age Difference between Parent-Headed and Child-Headed Samples**



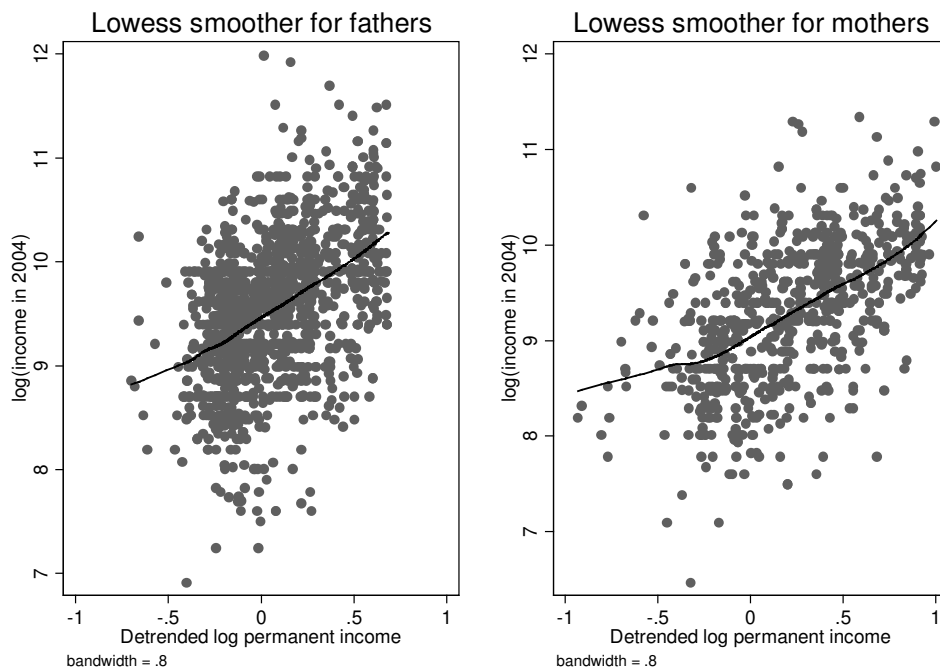
Source: Authors' own calculation.

**Figure 4: Distribution of the Number of Years Predicted Income Used to Calculate Parental Permanent Income**



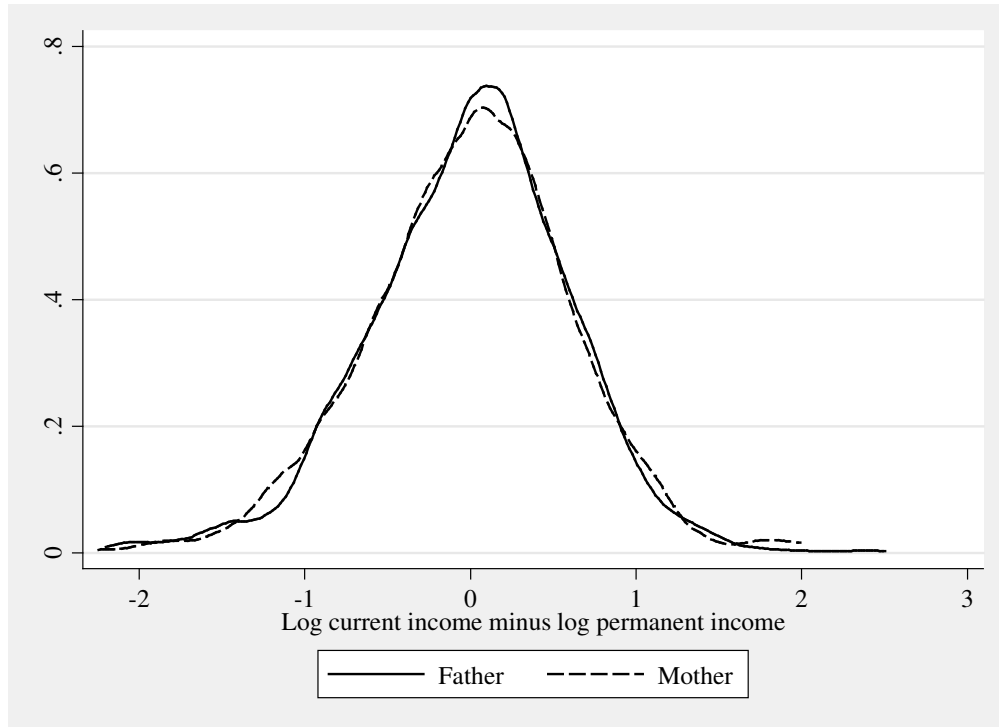
Source: Authors' own calculation.

**Figure 5: Relationship between Parental Current Income and Predicted Permanent Income**



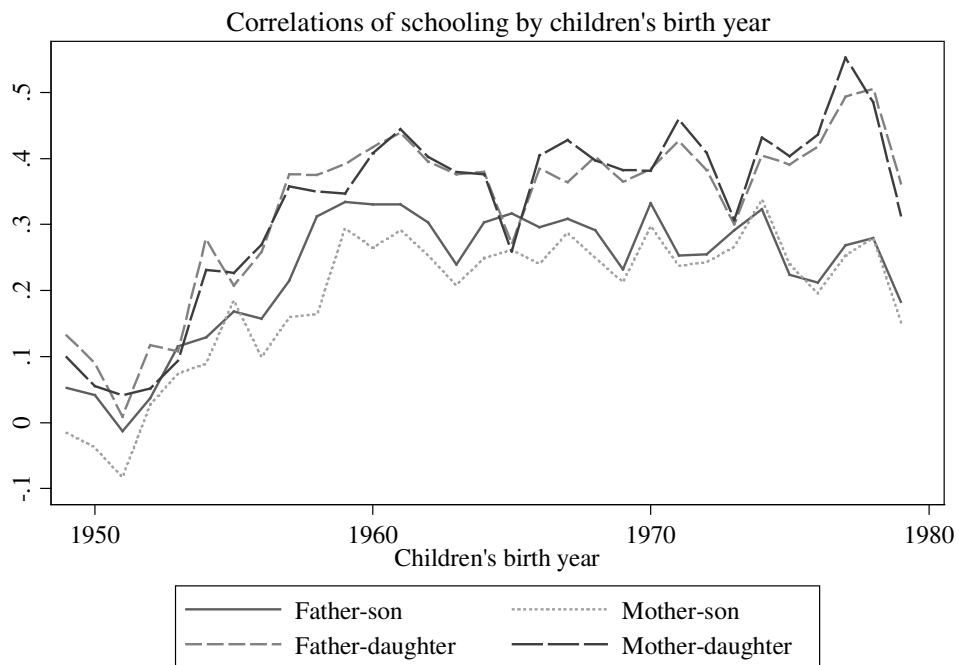
Source: Authors' own calculation.

**Figure 6: Parental Transitory Income Distribution**



Source: Authors' own calculation.

**Figure 7: Intergenerational Education Correlation (regression coefficients) by Children's Birth Year in Urban China, 2004**



Source: Authors' own calculation.

**Appendix A (without province dummy): Intergenerational Income Elasticities using Permanent Parental Income with Education/Occupation/Industry as Instruments**

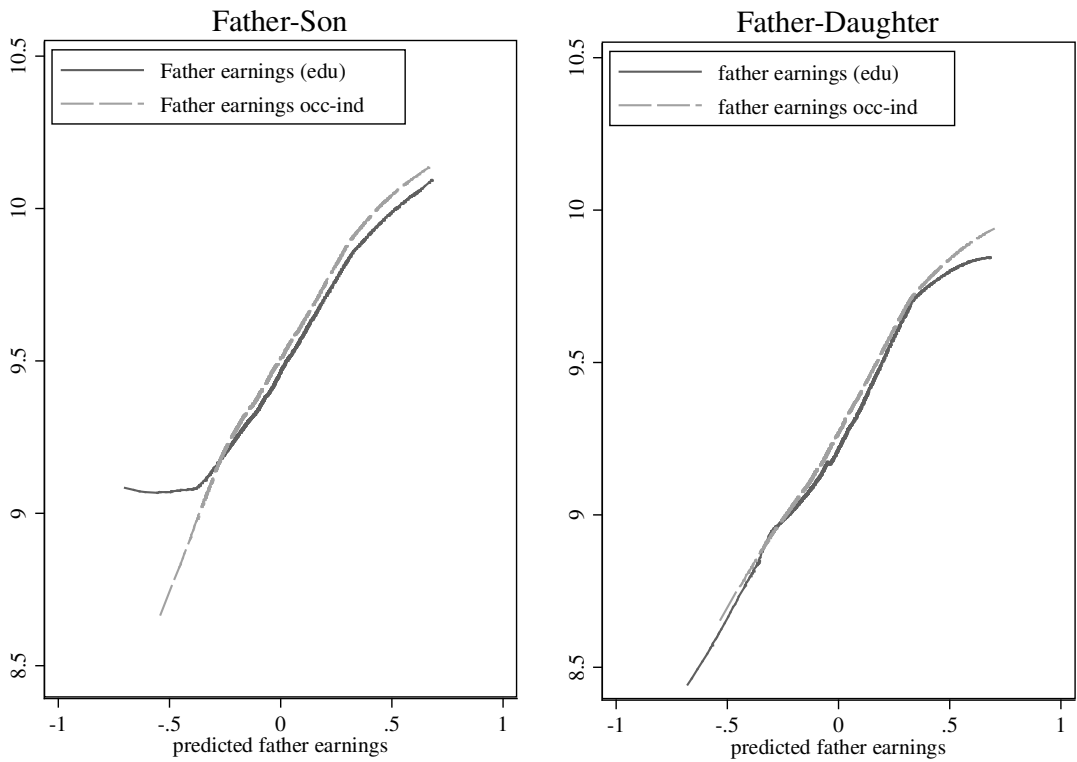
|  | All Children        | Aged >=23           | Aged >=30           | Aged 30-42          | Children with parents working in 2004 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------------------------|
| <b>Father-son</b>                          |                     |                     |                     |                     |                                       |
| Log(father's income) [IV=edu.&occ. & ind.] | 0.651<br>[0.097]*** | 0.615<br>[0.099]*** | 0.665<br>[0.127]*** | 0.666<br>[0.136]*** | 0.525<br>[0.170]***                   |
| Observations                               | 2813                | 2721                | 2011                | 1638                | 650                                   |
| <b>Father-daughter</b>                     |                     |                     |                     |                     |                                       |
| Log(father's income) [IV=edu.&occ. & ind.] | 0.908<br>[0.102]*** | 0.856<br>[0.103]*** | 0.968<br>[0.131]*** | 0.963<br>[0.140]*** | 0.515<br>[0.177]***                   |
| Observations                               | 2662                | 2573                | 1896                | 1593                | 595                                   |
| <b>Mother-son</b>                          |                     |                     |                     |                     |                                       |
| Log(mother's income) [IV=edu.&occ. & ind.] | 0.435<br>[0.084]*** | 0.402<br>[0.086]*** | 0.365<br>[0.112]*** | 0.338<br>[0.117]*** | 0.635<br>[0.158]***                   |
| Observations                               | 1734                | 1648                | 1014                | 909                 | 352                                   |
| <b>Mother-daughter</b>                     |                     |                     |                     |                     |                                       |
| Log(mother's income) [IV=edu.&occ. & ind.] | 0.509<br>[0.085]*** | 0.488<br>[0.086]*** | 0.544<br>[0.111]*** | 0.530<br>[0.114]*** | 0.521<br>[0.184]***                   |
| Observations                               | 1697                | 1616                | 1015                | 944                 | 307                                   |

Robust standard errors in brackets. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Father's income and mother's income are permanent incomes (see text for details). Each elasticity is from a separate regression.



**Appendix B: Unconditional Correlation between Children and Fathers' Predicted Incomes Using Education or Occupation/Industry as Instruments**



Source: Authors' own calculation.