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Abstract

While there is a large and growing body of research describing and analyzing changes in the Chinese income distribution, researchers have paid considerable less attention to inequality of opportunity. The aim of this paper is to contribute to filling this gap in the literature. The two main questions addressed empirically for the first time in a Chinese context are: To what extent are individuals' incomes and individual income differences due to factors beyond the individual's control (in Roemer's terminology "circumstances") and to what extent are they due to outcomes of the individual's own choices ("effort"). What is the relationship between income inequality and inequality of opportunity? For this purpose we use data from the China Health and Nutrition Survey collected from nine provinces during the period 1989 to 2006. The CHNS has detailed information about incomes and other factors enabling us to construct a host of circumstance and effort variables for the offspring. We find that China has a substantial degree of inequality of opportunity. Parental income and parents' type of employer explain about two thirds of the total inequality of opportunity. Notably, parental education plays only a minor role implying that parental connections remain important. The results show that the increase in income inequality during the period under study largely mirrors the increase in inequality of opportunity. Thus, increased income inequality does not reflect changes in effort variables, or expressed differently, increased income inequality has not been accompanied by a decrease in inequality of opportunity.

Keywords: Inequality of opportunity; Income inequality; China

JEL Codes: D63, D31, J62

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1. Introduction

Economic inequality is a topic of perennial concern discussed by economists, philosophers as well as policymakers. This applies also to China, where concerns have been raised about the high and continuously growing levels of income inequality. The literature on economic inequality has mainly focused on welfare differences in income or consumption. A widely used measure of economic inequality is the Gini coefficient. A criticism against the Gini and related measures of income inequality is that it merely gives a snapshot picture of the income distribution and neglects the possibly large income mobility that is occurring both within and between generations. Renewed interest in analyzing income mobility and intergenerational income mobility in particular was spawned by Zimmerman (1992) and Solon (1992) who showed that due to methodological deficiencies¹ the extent of inter-generational mobility had been substantially overstated by earlier research.

Another limitation of the Gini and other similar measures is that they are not helpful in addressing normative issues such as to what extent observed inequality reflects differences in individuals' efforts, which could be accepted by society or factors for which individuals cannot be held responsible, like family background and community; see e.g., Yao (1996), (1999).

The important works of Rawls (1971) and Sen (1980, 1985) emphasize the importance of making this distinction. They argue that the factors which affect an individual's advantage should be divided into two categories. One is called 'circumstances' and includes factors like family background, region of birth and gender, on which individuals have had no influence. The other category is called 'efforts' and consists of outcomes of the individual's choices like her education or type of work. In general, we know considerably more about the impact of the effort factors on individuals' outcomes than about how the outcomes are affected by the circumstance factors. However, economic as well as social research has recently paid increasing attention to the relative importance of circumstances in influencing individuals' wages or incomes; see e.g., Bourguignon et al. (1993,2007a,b); Ferreira et al. (2008). In this paper we will add to this growing literature by analyzing inequality of opportunity, its development and differences therein within China.

Empirical research on inequality of opportunity can be motivated in at least three ways. Firstly,

¹ The estimated correlations between parents' and children's incomes were downward biased due to the noise in the measures used to capture lifetime income, the fact that parents' and children's incomes were measured at different times of their life cycles, and the differences in attrition bias between different groups.

inequality of opportunity can be argued to be a more important concept than inequality of outcomes (Ferreira et al. (2008)). In fact, income inequality is not always positively correlated with inequality of opportunity; see Lefranc et al. (2006) for empirical evidence. Secondly, inequality of opportunity has a significant influence on how people view inequality of outcomes, social inequality, and income redistribution policy and social policies; see Alesina and Angeletos (2005); Bénabou and Bénabou (2006). Osberg and Smeeding's (2006) analysis which uses survey data from several countries demonstrates that people oppose inequality if it is due to bad luck, but less, or not at all, if it is due to low effort.

Finally, it can be argued that equality of opportunity is a key measure of economic development. If economic development means approaching distributive justice, this in turn implies that a significant degree of the income or earnings inequality ought to be due to effort, not to circumstances beyond the individuals' control.

Prior to 1978, China was a strictly planned economy where about 90 percent of the society's resources were distributed by the State. Equalitarianism was a key element of this model resulting in very low income inequality, in particular considering the size of the country and the vast regional differences in natural resources and other conditions for production. Thus, according to a household sample survey carried out by CNBS (Chinese National Bureau of Statistics), in 1978 the Gini coefficients of urban and rural areas were 0.16 and 0.21, respectively.² After China began her open door policy and adopted a more market-oriented approach, the proportion of state-owned companies has decreased significantly³. At the same time private and foreign companies have expanded rapidly contributing to the average growth rate of 9.8% since 1978. Between 1978 and 2007 the annual real income per capita of rural residents increased from 133.6 RMBn (\$19.6) to 4,140.6 RMB (\$606.2). Corresponding numbers for urban residents were 343.4 RMB (\$50.3) and 13,785.8 RMB (\$2,018.4), respectively. However, in parallel income inequality increased as well: according to the CNBS the Gini grew from 0.317 in 1978 to the internationally high level of 0.496 in 2006. This increase and the growing income gap between urban and rural areas as well as between coastal and inland districts – see *Figure 1* – are often considered as one of China's most critical social problems for sustained growth and development.

² See <http://www.stats.gov.cn/gqgl/gqglwz/index.htm>

³ The share of state-owned enterprises in industrial output declined from 82% in 1978 to 38.1% in 2007

While there is a large literature describing the changes in the Chinese income distribution since the economic reform⁴, substantially less is known about inequality of opportunity in China and about changes therein. Consequently, the same is also true for questions like: What is the relationship between income inequality and inequality of opportunity? Which circumstance factors are important in generating inequality of opportunity? How does inequality of opportunity in China look like in an international perspective? To the best of our knowledge this paper is the first attempt to provide some evidence to answer these and related questions.

For this purpose we use data from the China Health and Nutrition Survey (CHNS) collected from nine provinces during the period 1989 to 2006. We estimate parametric models by means of robust OLS regression in order to quantify the role of parental household income and size, parents' education and employer, region of origin, gender and age in generating inequality of opportunities and inequality in current income.

We find that the parents' household income, father's and mother's employer explain 23, 19 and 20 percent, respectively, of total inequality of opportunity. Notably, parents' type of employment is more important than their education in explaining the earnings of the offspring, implying that parental connections (Guanxi) continue to play a central role. However, the influence of both parents' employer and household income has decreased somewhat since the mid-1990s.

The remainder of the paper is structured as follows. Section 2 gives a short review of the inequality of opportunity literature; section 3 presents the data; the fourth section contains the empirical model and estimation results. Finally, section 5 concludes.

2 Earlier Research

The concept of "equality of opportunity" has changed over time. Originally, equality of opportunity was defined in terms of absence of legal barriers to certain educations, occupations or jobs. Rawls (1971) and Sen (1980; 1985) broadened the concept arguing that one needs to account for the fact that individuals differ and that some of their differences are related to a set of arbitrarily distributed circumstances. As a consequence, it is not sufficient to define inequality of opportunity by how access to education and employment is regulated by law.

⁴ See e.g., Knight and Song (1991); Kanbur and Zhang (1999); Gustafsson and Li (2002); Lu (2002); Fan et al. (2002); Heerink et al. (2006)

Inequality of opportunity caused by the circumstance factors should be compensated for by the society. Dworkin (1981a, 1981b) went one step further and argued that all factors, which affect the individual's outcomes but which are outside her control, should be compensated for by society.

The early research on inequality of opportunity did not focus on empirical evidence until Roemer's (1998) seminal contribution on measurement of inequality of opportunity in which he makes the distinction between "circumstance" and "effort" variables and suggests how to operationalise them.⁵ Still, empirical research on this topic remains rather scarce.

Important contributions are the papers by Bourguignon et al. (2007a,b) that propose a variety of decomposition methodologies with the help of which one can analyze the extent to which income inequality in a country is associated with inequalities in observed circumstances of origin (like parental education, family size, etc.). Bourguignon et al. (2007a) examine inequality of opportunity for labor earnings in six Latin American countries (Brazil, Colombia, Ecuador, Guatemala, Panama and Peru) which all have in common an internationally high degree of income inequality; the Gini coefficient varies between 0.79 (for Guatemala) and 0.57 (for Panama). The proportion of income inequality due to inequality of opportunity is highest in Brazil (35 percent) and lowest in Colombia (20 per cent). Of the individual circumstance variables, both parents education stand out as the most important contributors to inequality of opportunity. The study by Ferreira et al. (2008) considers the same set of countries but focuses on inequality in consumption expenditures and finds essentially the same pattern as in Bourguignon et al. (2007a). These techniques have been applied to a number of Latin American and African countries by Nunez et al. (2007) and Cogneau et al. (2006), respectively. Cogneau and Mesple-Soms (2008) examine inequality of opportunity in five sub-Saharan countries in Africa (Ivory Coast, Ghana, Guinea, Madagascar and Uganda). These countries are relatively similar with respect to income inequality but differ more regarding inequality of opportunity. A particularly interesting finding is that the two former British colonies (Ghana and Uganda) have a considerably higher educational and occupational mobility than the three former French colonies.

Other studies have applied non-parametric decompositions to measure inequality of

⁵ In a later important paper, Roemer (2004) discusses the precise meaning of "equality of opportunity" and points out that in general it does not imply complete intergenerational income mobility.

opportunity for income and education between different regions within a country; see Checchi and Peragine (2005) for Italy and Cogneau and Gignoux (2005) for Brazil. A few studies have used stochastic dominance rankings to compare differences in the degree of inequality between countries: Lefranc et al. (2006) do this for a set of OECD countries and Barros et al. (2008) perform a comparative analysis for a number of Latin American countries. The former study uses income as the outcome measure, whereas latter deals with children's unequal access to basic services. A recent paper by Ferreira and Gignoux (2008) explores both parametric and non-parametric decomposition methods to measure inequality of opportunity in six Latin American countries.

The literature mentioned above has almost exclusively been concerned with inequality on opportunity in developing countries. As for more developed countries, Lefranc et al. (2006) have analyzed nine OECD countries employing a stochastic dominance approach and non-parametric statistical tests. An interesting result of their study is that inequality of opportunity is not necessarily strongly nor positively correlated with income inequality. Thus, for example, they find that Belgium has low income inequality but comparatively high inequality of opportunity, whereas the opposite pattern is observed for Western Germany.

3 Data Description

The sample used in this study is constructed from data from the China Health and Nutrition Survey (CHNS), which is an ongoing international collaborative project between the Carolina Population Center at the University of North Carolina at Chapel Hill and the Chinese Center for Disease Control and Prevention.⁶ The primary aim of the project is to examine the effects of health, nutrition and family planning policies during the process of the social and economic transformation of Chinese society. The data set contains rich information on individuals and households in terms of economic, demographic, and social factors including age, gender, household income, individual income, working time, transportation ways, and parents' background, and can hence also be used for studies of other phenomena than those related directly to health and nutrition.

The CHNS is a longitudinal survey which includes seven waves in 1989, 1991, 1993, 1997, 2000, 2004, 2006, and it was conducted by an international team of researchers representing

⁶ A detailed description of the data can be obtained from <http://www.cpc.unc.edu/china/>.

different disciplines like nutrition, public health, economics, sociology, Chinese studies, and demography. The 1989 survey included 3,795 households and in 1993, 1997 and 2000, 3,616, 3,441, 3,875 and 4,403 households respectively, participated in the survey. All individuals in each household were surveyed in 1991, 1993, 1997 and 2000 for all data. This is important for the current paper as it provides us with data from two generations. The CHNS project has created Longitudinal Master files to facilitate longitudinal analyses of the data collected. The construction of the Master file as well as of the individual surveys is described in detail on the project's homepage (see footnote 6). Note also, that owing to the fact we observe 59.8% of the sample individuals at least twice we can reduce some of the transitory variation in income.

The surveys were conducted in three coastal provinces: Liaoning, Shandong, and Jiangsu, and five inland provinces: Henan, Hubei, Hunan, Guangxi and Guizhou.^{7,8} Although the sample is quite diverse with respect to a set of socioeconomic factors, it should, however, be noted that it does not contain the three most developed regions, Beijing, Guangdong and Shanghai, nor does it include the least developed regions like Yunnan, Xinjiang, and Xizang. (Thus, there is a possibility that we are under- or overestimating the true extent of inequality of opportunity.)

We have applied the following sample restrictions on the original data set. First, we keep only the observations for which there is information at the family level, i.e., where there is information concerning parental background (education, employment and income) and the children's gender, age, birth place, education, and employment. Second, for the offspring we only include in the estimation sample individuals who are in the age range 20 to 50 years. We do this for the following reasons: we exclude individuals under 20 years as they may still be studying and consequently do not have an income. For offspring over 50 years of age, missing values for parents' income are common.

4 Empirical Strategy

⁷ Liaoning was replaced by Heilongjiang in the 1997 wave, but returned to the survey in 2000.

⁸ Within each province, counties are stratified by income and a weighted sampling scheme has been used to randomly select a number of counties within which a number of villages and townships are randomly selected. The number of primary sampling units has increased over time.

4.1 The Statistical Model

In order to measure the degree of inequality of opportunity associated with the distribution of income in our sample we make use of a method originally proposed by Bourguignon et al. (2007a). This follows Roemer's (1998) work quite closely and divides earnings determinants into two categories: "circumstances" and "effort", of which the former are the factors that are exogenous to the individual while the latter are endogenous. Henceforth, they will be denoted by C and E , respectively. The effort variables are usually thought of as the individuals' human capital, whereas the circumstances include factors that are beyond the individual's control (like, age, gender, race, parental variables, etc.). In short, the method used simulates the reduction in income inequality that would arise if the impact of the circumstance variables was purged off the income distribution.

In addition to E and C , there is a residual component encompassing the unobserved circumstance and effort variables, measurement error and transitory variations from the individual's permanent income. Thus, we can write the individual's income function as $W_i = F(C_i, E_i, u_i)$. For convenience we express this on a linearized form:

$$w_i = \alpha C_i + \beta E_i + u_i \quad (1)$$

Where w_i is the logarithm of the individual's income (W) deflated by the 2006 consumer price index, α and β are coefficient vectors and u_i denotes the residual. The latter is assumed to be independent from C_i and E_i , to have zero mean and to be identically and be independently distributed across individuals. As explained at some length in Bourguignon et al. (2007a), this procedure provides a lower bound estimate of the extent of inequality of opportunity. This is because in practice we are not likely to observe all factors in C_i , and some of these (for example wealth) may be correlated with E_i . This implies that as these unobserved components of C will be part of u , they will now be correlated with E and hence introduce bias⁹ in the estimates of α and β .¹⁰

⁹ The conventional solution is to use instrumental variables techniques. However, commonly used instruments like family background or distance to school are not applicable in this context. For an extensive discussion of the likely sign and magnitude of the potential bias, see Bourguignon et al. (2007a).

¹⁰ A more general specification of equation (1) would include interactions between C and E . This would allow us to distinguish between "partial" and "total" effects of observed circumstances on offspring's income as discussed in Bourguignon et al. (2007a). For instance, in China the parents' income may have a considerable influence on their children's education; see Chen and Feng (2009) for evidence that supports this conjecture. However, a complication for doing this, is that education variable in our data set is not continuous.

The version of (1) estimated is specified as follows:

$$w_i = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Province} + \beta_3 \text{Urban area} + \beta_4 \text{Age(cubic function)} + \beta_5 \text{Father's education} + \beta_6 \text{Father's employer} + \beta_7 \text{Mother's education} + \beta_8 \text{Mother's employer} + \beta_9 \ln(\text{household income}) + \beta_{10} \text{Household size} + \beta_{11} \text{Wave of survey} + u_i \quad (2)$$

In (2) the circumstance measures include the father's and the mother's education and employer, respectively as well as the parental household size. We have estimated two versions of equation (2): one with and another without parental household income as a regressor. The parental household income¹¹, that is, the income of the family from which the person originates and from which the individuals' own income is deducted (in case s/he still lives with the parents), is also included in the model. Furthermore, the model includes variables for the individuals' age, province of birth and whether the individual is born in a rural or urban area.

Our analysis of inequality of opportunity proceeds as follows. First, we estimate equation (2) with robust OLS regression without the effort variables and obtain predicted values \hat{w} . Next, we calculate the Gini coefficient of \hat{w} and denote it by $G(\hat{w})$. The ratio, $G(\hat{w})/G(\tilde{w})$, where $G(\tilde{w})$ is the Gini coefficient of the original incomes is our measure of inequality of opportunity.

If we are interested in the individual components in C and their contribution to the overall inequality of opportunity, we can again carry out robust OLS estimation of (2) but now dropping only the variable of interest, gender, say. Next, we obtain a new predicted individual income $\hat{w}(\text{no gender})$, then calculate the Gini coefficient for $\hat{w}(\text{no gender})$, which we now call $G(\hat{w}(\text{no gender}))$. The ratio $(G(\hat{w}) - G(\hat{w}(\text{no gender}))) / (G(\hat{w}))$ shows how much the circumstance factor gender contributes to inequality of opportunity. The same procedure can be repeated for each component of C.

4.2 Descriptive Statistics

Descriptive statistics are given in *Table 1*. Our unbalanced panel has 1,287 valid observations on the offspring. The average age of the offspring is 27 years, which is important to keep in mind when interpreting the results. The average annual disposable income of the children is 7,120 RMB during the survey periods. The average household disposable income (excluding

¹¹ The income measure is quite comprehensive as it covers not only income from work but also income from business, farming, fishing, gardening, livestock, pensions and a number of other minor sources.

the offspring's income when s/he lives at home) is 38,501 RMB. Average household size is five members.¹²

Two thirds of the offspring observations are males. The number of individuals from inland provinces account for about half of the whole sample. Likewise, the number of observations for persons with an urban and a rural identity card are roughly the same. About three out of four of the children have a middle school, high school or vocational school degree. Thus, the educational level of the offspring is clearly higher than that of their parents; about two thirds of both the fathers and the mothers have a middle school degree or lower. 62 percent of the offspring are employed in state-owned enterprises or state institutions which is higher than the share of their parents. The main reason for the difference is that the share of parents working in family (contracted) farms is twice as high as that of the offspring. The proportion of both parents and offspring working in enterprises that are partly or fully owned by foreign investors is rather small. This reflects the fact that a considerable part of the data was collected in the nineties and that the provinces the data emanate from, except for Shandong, were not Special Economic Zones which received the bulk of the foreign direct investments.

4.3 Inequality of Opportunity in China 1989-2006

The estimation results are presented in *Table 2*. We can see that living in one of the more developed, coastal provinces, being born in an urban area, being male, and having parents with a high school or vocational education all have a positive influence on the income of the offspring. Moreover, the indicator variables for fathers being employed by the government or a state-owned institution or enterprise carry positive and statistically significant coefficient estimates (but they do not for mothers). This is in line with the findings of the study by Chen and Feng (2009) according to which the father's occupation is a more important determinant of the children's wage income than his education and the education and occupation of his wife. Having parents working in companies which are fully or partly foreign owned does not affect offspring's income. This may be due to the few observations of such parents in the sample (which in turn is due to the provinces covered but also because the parental generation is less likely to be employed in these firms than their children).

Of all the circumstance variables, parental household income has the largest marginal effect; a 10 percent increase in parental household income gives rise to a 4.5 percent higher income of

¹² Households are, owing the one child policy in urban areas, considerably larger in the rural areas.

the offspring. Also other circumstance variables have pronounced marginal effects: living in a coastal province adds 12 percent to the offspring's income and being born in an urban area contributes additional 14 percent. Children to fathers employed in the government sector or collective enterprises also have considerably higher incomes than those whose father was working in the farm sector. This is likely to reflect the strong importance of social connections, the so called Guanxi. The year dummies attach fairly large coefficients reflecting the strong growth in economic activity and earnings in China during the period under study.

4.3.1 The Relationship between Inequality of Opportunity and Income Inequality

Next we consider the Gini-ratios described in section 4.1. That is, we compare the Gini obtained from estimation of (2) with the Gini of the offsprings' incomes. These ratios are displayed in Figure 2. We may note that there is a similar trend in the estimated Ginis for both income and opportunity as in the Gini coefficient for whole China computed by the World Bank (Luo and Zhu, 2008). The low Gini for income in the beginning of the 1990s reflects the higher prices for farming products during that time, which contributed to a reduction in the income gap between rural and urban areas.

The Gini of opportunity estimated from the observed circumstances variables has been growing from 1989 to 2004, displaying a corresponding trend as in the sample Gini or the Gini reported by the World Bank. The proportion of inequality in opportunity to inequality to income is 0.46, 0.49, 0.48, 0.57, 0.65 and 0.63 in the years 1989, 1991, 1993, 1997, 2000, 2004 and 2006, respectively. Consequently, as can be seen from Figure 2, the increase in income equality is largely mirroring an increasing inequality of opportunity. This implies that the observed increase in income inequality is to be considered as a more severe problem as it has not been counteracted by an increase in mobility.

4.3.2 Inequality of Opportunity and the Individual Circumstance Variables

Table 3 shows the contributions of the individual circumstance variables to the overall inequality of opportunity and how these have changed over time. As in connection with equation (2), we perform the calculations including and excluding parental household income as a circumstance variable. We begin by looking at the results when parental household income is included. These are found in the upper part of *Table 3*.

A first thing worth noting is that the variable which contributes most to inequality of opportunity is parental household income. On average this accounts for 23 percent of the Gini of inequality of opportunity. Another important variable is parents' employment. Mother's and father's type of employer contribute on average 20 and 19 percent, respectively to the inequality of opportunity for the offspring. This finding emphasizes once again the key role played by the Guanxi, social connections. Notably, parents' education plays a minor role reflecting the small influence of education for societal positions for the parental generation. Other circumstance variables like place of birth and age of the offspring have only a small impact on the overall inequality of opportunity.

A comparison of periods 1989-97 and 2000-06 shows that there have been relatively small changes in which circumstance factors that make the largest contributions to overall inequality of opportunity. We may note that the influence of parental household income is on average lower in the later period, and that the importance of the father's as well as mother's employer has increased slightly. Of the less influential circumstances, the contributions of being born in a coastal province and an urban area and father's education have decreased since the nineties. It is important, however, to keep in mind that when making these comparisons we are splitting an already small sample in two parts.

Turning now to the lower part of *Table 3*, we can see that exclusion of parental household income from the set of circumstance variables leads to an increase in the relative importance of living in a coastal province and whether the person was born in an urban or rural area. Although their contributions to inequality of opportunity are larger when parental household income is not accounted for, their magnitudes remain quite modest. Notably, the contribution of having been born in an urban area is much lower in the second part of the period under study. Also worth noting is that in recent years father's employer is the circumstance variable which has the largest contribution to inequality of opportunity. Similarly to the calculations including parental household income, we do not find that parents' education make a noticeable difference for inequality of opportunity.

What happens to the income distribution when we eliminate the effect of the observed circumstance variables? In other words, what is the contribution of effort variables to income inequality? Using our estimates which include parental household income as a circumstance

factor, the Gini coefficients purged off the impact of circumstance variables are 0.15, 0.14, 0.18, 0.15, 0.17, 0.17, and 0.16 for years 1989, 1991, 1993, 1997, 2000, 2004 and 2006, respectively. (Corresponding calculations with parental household income excluded from the set of circumstance variables, give very similar results.) This indicates that the contribution of individual efforts to improve their lives has had a relatively small impact on inequality and that this has not changed much during the past 20 years.

The remarkable changes that have taken place in the Chinese economy and society during the past 30 years have led a well-known increase in income inequality. However, as we have demonstrated in this paper, this has not been accompanied by an increase in equality of opportunity, but rather the reverse. It seems as the people who so far have benefitted most from the market-oriented model are the offspring of people who are socially well connected and who have higher incomes. Unlike many other emerging economies, inequality of opportunity in China is only weakly related to parents' education. In the nine provinces studied here, being born in a coastal province or an urban area is not a major advantage¹³ (although one should account for the fact that these advantages are to some extent captured by social connection and parental incomes). The influence of these factors seem to have decreased somewhat, presumably due to the gradual abolition of the Hukou discrimination of rural citizens.

Marketisation of the economy is probably almost inevitably accompanied by an increase in income inequality, especially when the initial situation, like in China, is characterized by extreme income equality. But the basic idea behind the market reforms was that by enabling some citizens to become rich this would in turn help the rest to become rich as well. Our analysis shows that at least so far there are few traces of the reforms leveling the playing field for the children of less advantaged parents.

An optimistic view is that this will eventually occur, but that it takes time. It is not unusual that in the short term the groups that benefit first from large societal reforms are the relatively well-off socioeconomic groups and their offspring. An example is the expansion of higher education in Britain which primarily gained offspring of middle-class families; see Blanden et al. (2004). A more pessimistic view would be that because circumstances like social

¹³ Differences are likely to have been larger if the nine provinces had included more of the most developed provinces that had Special Economic Zone status.

connections play a much stronger role than for example parental education¹⁴, intergenerational persistence and inequality of opportunity would remain high.

In any event, our analysis indicates that the policy conclusion from studies of Latin America and other developing countries, to invest in expanding education, is less likely to apply to China. So, what else can the government do to promote inequality of opportunity?¹⁵ At a fairly general level, we think stronger measures to significantly reduce the importance of social connections are called for. This could for instance mean governmental actions to directly affect equality of access to education in disadvantages areas. In order to break the role of Guanxi, policies directly aiming at equalization of employment opportunities, such as for example quotas for employees from disadvantaged areas, seem to be necessary.

5 Conclusions

This paper presents the first available evidence on inequality of opportunity in China. We use data from the China Health and Nutrition Survey from years 1989 to 2006 to examine to which extent income inequality reflects differences in individuals' incomes due to "circumstance" factors, that is, factors beyond their control.

Summing up briefly our findings, they are: China has a high degree of inequality of opportunity. A large fraction of economic advantage or disadvantage is transmitted from one generation to the next, within families. Parental income and parent's type of employer explain roughly two thirds of the total inequality of opportunity, whereas in contrast to findings from other emerging economies, parental education plays a minor role. Thus, parental connections remain an important transmission mechanism for the intergenerational persistence of economic advantage and disadvantage. Our results show that the increase in income inequality during the period largely mirrors an increase in inequality of opportunity. Obviously, this adds to the severity of income inequality problem in China and implies that further policies at breaking the Guanxi and at equalization of education and employment opportunities for people for disadvantages areas called for.

For further research on intergenerational income mobility and equality of opportunity in China

¹⁴ This assumes that the expansion of higher education, which leads to a higher share of youth cohorts with university level education, would not affect the importance of social connectedness.

¹⁵ For a comprehensive discussion of policies aiming at achievement of equality of opportunity, see Roemer (2006).

it would be important to have access to larger data sets and to have better measures of life-time earnings (especially for the offspring). It would also be valuable to have data that include some of the major cities like Beijing, Shanghai or Guangzhou as well as some of the least developed provinces.

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Table 1. Descriptive Statistics

Variable	Percent	Variable	
<i>Gender: female</i>	39.9	<i>Offspring's age</i>	26.5 years
<i>Province: coastal</i>	53.5	<i>Parental household: Size</i>	4.8 persons
		<i>Income</i>	33,994 RMB
<i>Area of birth: urban</i>	51.6	<i>Offspring's personal income</i>	7,121 RMB
<i>Parental education</i>			
<u>Father:</u>			
Primary or less	42.8		
Middle school	23.1		
High school, vocational school	22.1		
College and above	12.0		
<u>Mother:</u>			
Primary or less	58.8		
Middle school	20.8		
High school, vocational school	16.2		
College and above	4.2		
<u>Offspring:</u>			
Primary or less	8.4		
Middle school	39.9		
High school, vocational school	34.9		
College and above	16.8		
<i>Parental employment, type of employer</i>			
<u>Father:</u>			
Farming	18.4		
Collectives	9.2		
Private enterprise	14.5		
Government or state owned enterprise	57.8		
Foreign owned enterprise	0.1		
<u>Mother:</u>			
Farming	23.2		
Collectives	12.0		
Private enterprise	16.6		
Government or state owned enterprise	48.0		
Foreign owned enterprise	0.2		
<u>Offspring:</u>			
Farming	12.0		
Collectives	10.6		
Private enterprise	13.7		
Government or state owned enterprise	61.7		
Foreign owned enterprise	2.0		

Table 2. Income equations of offspring

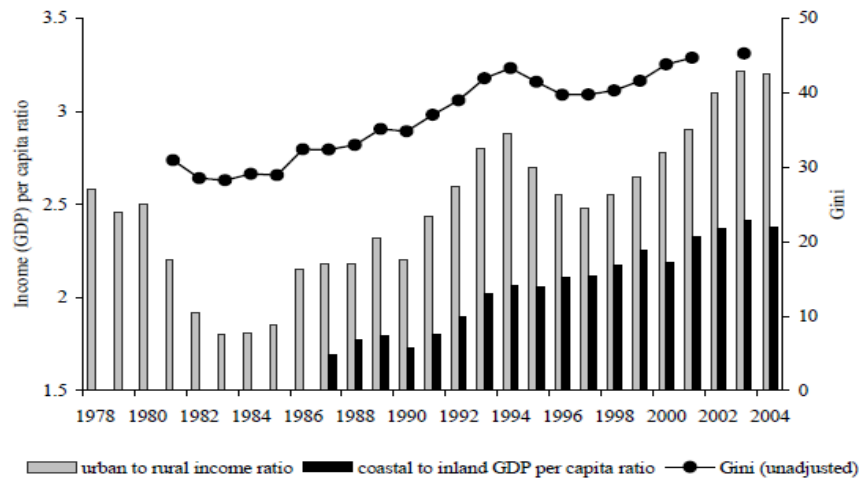
Explanatory variables	Coefficient
<i>Gender: male</i>	0.079** (0.040)
<i>Province: coastal</i>	0.122*** (0.045)
<i>Area: urban</i>	0.143*** (0.052)
<i>Father's education:</i>	
Secondary level	-0.001 (0.057)
Higher, technical or vocational education	0.015 (0.059)
College or above	-0.128** (0.067)
<i>Mother's education:</i>	
Secondary level	-0.092* (0.055)
Higher, technical or vocational education	-0.070 (0.066)
College or above	-0.209** (0.103)
<i>Father's employer:</i>	
Collective	0.526*** (0.130)
Private enterprise	0.224** (0.121)
State owned enterprise	0.370*** (0.112)
Foreign owned	-0.068 (0.148)
<i>Mother's employer:</i>	
Collective	-0.043 (0.116)
Private enterprise	0.134 (0.110)
State owned enterprise	-0.096 (0.093)
Foreign owned	0.511 (0.338)
<i>Log parental household income</i>	0.454*** (0.050)
<i>Size of parental household</i>	-0.086*** (0.018)
R ²	0.457

*significant at 10%; **significant at 5%; ***significant at 1%. Omitted categories are: female, inland provinces, parent with primary and lower education, parent employed in farming sector.

Table 3. Contributions to the Gini of inequality of opportunity in China, 1989-1997 and 2000-06 (%)

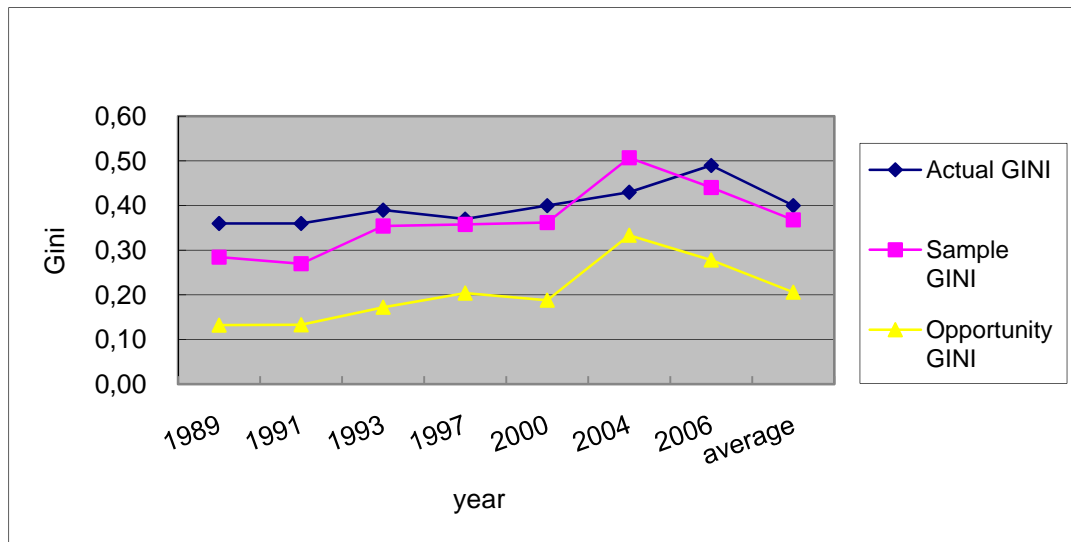
Period	Parental household income	Gender	Coastal province	Urban area	Father's education
1989-97	25.3	1.7	1.4	1.4	5.7
2000-06	20.2	0.6	0.4	-0.8	0.8
	Father's employer	Mother's education	Mother's employer	Household size	
1989-97	17.5	0.7	18.1	0.7	
2000-06	21.4	1.1	22.2	3.5	
Period	Parental household income	Gender	Coastal province	Urban area	Father's education
1989-97	Not included	1.1	6.3	14.1	3.2
2000-06	Not included	1.3	5.5	3.4	1.3
	Father's employer	Mother's education	Mother's employer	Household size	
1989-97	-1.7	3.0	1.4	2.3	
2000-06	11.3	0.7	4.5	-0.1	

Figure 1: Income inequality in China



Source: Huang and Luo(2008)

Figure 2 : Actual Gini, Sample Gini and Opportunity Gini in China from 1989 to 2006



Source of actual Gini is from World Bank.

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