The Long Term Impacts of the Cultural Revolution on Economic Performance of Urban Residents in China[†]

Dong Zhou[††]

dong.zhou@email.ucr.edu

University of California, Riverside

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[††] Dong Zhou, Department of Economics, University of California, Riverside, CA 92521, U.S.A., Phone: 1-951-880-7151. Email: dong.zhou@email.ucr.edu.

Abstract

The Chinese Cultural Revolution was one of the most disruptive events in human history between 1966 and 1977. This study explores multiple datasets, constructs indexes measuring intensities of being treated by the large-scale closure of schools as well as the forced migration and evaluate the long-term impacts of exposure to the Cultural Revolution in urban China. Based on the theoretical framework of life-cycle model, empirical evidence consistently shows the Cultural Revolution has produced a lasting negative effect on permanent income for the subjected birth cohorts (1946-1961) since 1990s and this effect was amplified as Chinese market economy increasingly evolved. The mechanism of the impact includes channels of productivity determinants (e.g., education attainment, work experience and health condition), marriage life, and attitude towards the determinants of success. These conclusions are shown to be robust to contemporaneous and cross-regions comparisons, as well as to a variety of controls for family background and exposure to the Great Famine.

Key Words: The Cultural Revolution; Long Term Impacts; Economic Performance; Urban China

JEL codes: O22; O15; J48; I28; J24; J31;

1. Introduction

In the past decade, a growing branch of literature examining the impacts of historic legacies, such as the origins of the colonizers in the Americas, the slave trade and colonial institutions, has emerged. These studies provide empirical evidence supporting persistent effects of historical events on current economic development (Acemoglu et al., 2001; Banerjee et al., 2005; Engerman and Sokoloff, 1997; Glaeser and Shleifer, 2002; Ichino et al. 2004; Iyer, 2007; and Nunn 2007, 2008, 2009). A related article looking into micro perspectives is from Dell (2010): measuring the impact of the institution of forced labor (Mining Mita) on the affected households' current consumption in Peru. This paper contributes to the literature by examining how a historic event affected individual economic development: quantifying the effect of the Cultural Revolution in urban China. As noted by Nunn (2008), the existing research has its shortcomings in its inability to distinguish the channels through which historical events matter today. This study also adds dimension to the current literature by exploring the transmission mechanism from microeconomic-perspectives and discusses the potential channels through which the Cultural Revolution affects current economic performance of affected cohorts.

As the largest developing country, China has recently experienced substantial growth since its reform and opening to international trade. The Cultural Revolution (1966-1977) was deeply implicated in Chinese institutional transition away from a close and planned economy to an open and market-oriented economy. It lasted for more than a decade and during this period, there were dramatic and intricate policies implemented nationally (Deng and Treiman, 1997). For example, all levels of schools were shut down for certain years. No formal higher education was provided for a decade. Seventeen million urban youth were "rusticated", by being relocated to rural areas for several years in what came to be known as the Send-Down Movement. Considering the uniqueness and scale of these programs, it is intriguing to explore its current impacts in the urban labor market, and to understand the economic gain or loss to the population primarily subjected to them.

Research Papers on the Cultural Revolution have gradually increased since 1990s. Most of them are descriptive, with few empirical papers in publication. Gregory and Meng (2003) quantified the loss in education attainment caused by the closure of schools. But following studies found no adverse role of the educational interruption in reducing returns to schooling (Meng, 2003 and Zhang, 2007). Picking-up decision was explored by Han and Zhang (2007)

who found substantial increases in subsequent education attainments of subjected generations (Han and Zhang, 2010). Another branch of the literature analyzes how the Send-Down Movement affects an individual's life course by comparing the sent-down with the non-sent-down youth. Hou and Zhou (1999) identified the sent-down group by the first year they entered labor market and showed that the sent-down youth earned more and had more schooling compared with their counterparts. Li, Rosenzweig and Zhang (2013) utilized twin survey in five cities and found that staying longer in the rural areas has a large positive effect on monthly earnings among the sent-down twins. Does the forced rustication experience during youthhood really benefit? As will be discussed later, selection problems across families and within households as well as simultaneous exposures to different interruptions cast doubts on simple comparisons between sent-down and non-sent-down urban youth and weaken the validity of the ex-post-facto positive effects of the Send-Down Movement.[1] The positive marginal effect of staying an extra year in the rural areas might purely capture the subsequent evolvement of adaptability or performances of the more able children or twin.

Different from the existing literature, this paper studies how the concurrent policies have simultaneously impacted the subjected cohorts' permanent income based on deviations from the life-cycle model, examines how this effect changes as the market-oriented economy increasingly evolves and explores the channels of its transmission mechanism. To the best of my knowledge, this is the first paper that systematically and comprehensively evaluates the long-term impacts of the Cultural Revolution on individuals' annual earnings from different dimensions and points of time. One important problem is that it is difficult to find a single measure for the Cultural Revolution due to its complexity and the interrelationship of its different conflicts. For example, urban population is not only exposed to educational interruptions that varied by region, but also heterogeneous treatment of rustication implemented unevenly. Also other common specifics (e.g., public shamming) simultaneously happened during this period. Studies that focus on one aspect might lead to bias and misunderstanding the subsequent influences of the Cultural Revolution. With the rich urban micro-data of Chinese Household Income Project Survey (CHIPS), I design

[1] Selective Sending and Returning: the well-educated elites, graduates of high schools as well as colleges and kids with particular family background were more likely to be sent at the beginning of the Cultural Revolution. Early returns to urban areas, to some extent, were potentially related with regional policies or household social network; Selective Placement: the sent-down experiences varied depending on which regions they had been sent. Some are sent to places with cumbersome manual works. But some rural areas were with better environments, e.g., there were expansions of construction of senior high schools in some rural areas (Zhang, 2010) and less violence. When it comes to the non-sent-youth at the same period, they encountered different conflicts in urban areas caused by the Cultural Revolution, for example, educational interruptions and public shamming (Zhou, 1999).

three measures of different exposures to those policies to gauge the loss of the primary exposed cohorts and also to track them overtime.

Estimates from different measures and samples consistently show that the Cultural Revolution significantly lowers the subjected individuals' annual earnings (around 11%) and this effect was amplified from early 1990s to 2000s by 20% as the market became more competitive. Analyzing the closure of schools and the Send-Down Movement separately, empirical evidences show that the latter policy plays a significantly stronger adverse role. After establishing the existence of the impacts, I further look into channels through which it matters, including productivity determinants (e.g. educational attainment, working experience, and health condition), marriage life and preferences. Education attainment is the major channel and accounts for around 50% of the overall effect. Interestingly, estimates of a preference index indicate that the Send-Down Movement has shaped the sent-down youth's personality in a positive way making them become perseverant. Their attitude towards individuals' diligence against personal luck in determinant in personal success led them to being positive and earning more . The findings are shown to be robust to different subsample evaluations, and to a variety of controls for family background and confounding factors (e.g., the Great Famine: 1959-1961). Placebo tests for the rural permanent residents and rural-urban migrants have been done separately and strongly support the existence of causal effect.

The remaining part of this paper is organized as follows. Section 2 documents the historical background and explains the identification methodology. Section 3 describes the theoretical framework and empirical models. Section 4 presents the primary results and examines the potential channels through which the Cultural Revolution matters. Robustness checks are also provided. Section 5 concludes the paper.

2. Historical Background and Identification Methodology

The Cultural Revolution lasted for more than a decade and involved abundant conflicts (Li et al. 2013; Spence, 2001; Treiman et al., 1997; and Zhou et al., 1999). It has influenced the evolution of social values, the political institutions and individual developments in China. Considering the prime stage of human capital development, I focus on urban children of school ages during this period who were exposed to multiple interruptions to their developments (birth cohorts: 1946-1961). The first large-scale interruption is, as is well known, the educational interruption. Different levels of schools were closed for certain periods which disrupted

advancement of students through the formal education system. Aside from the closure of schools, the length and substance of education were also changed. Secondly, at the same time, those cohorts also were forced to leave cities and live in rural areas (the Send-Down Movement). Thirdly, there were other conflicts, for example Red Guards Campaign and public shamming. Overall, the first two were large-scale and are more likely to have lasting impacts. Details of these two policies and identification methodology are documented in the following sections, respectively.

2.1 The Closure of Schools

Before the Cultural Revolution, the formal educational system has a six-three-three-four structure in China: six years of primary school, three years of junior secondary school, three years of senior secondary school, and four years of university education. Children began formal primary schooling at the age of 7 or 8. Primary and secondary schooling were the most important components and involved large portions of the population. Newly enrolled students in the secondary schools accounted for 17% of all enrollments and the proportion of primary students constituted 83% in 1965. Meanwhile, the ratio of enrolled students in colleges to all newly enrolled students was far below 1%. In all, the number of schools and students below colleges accounted for the major component in the formal education system before the Cultural Revolution (Data source is *China Education Statistics Year Books*: 1972-2008). Correspondingly, the closure of secondary and primary schools would impact majority of the population.

After the *May 16th Notification* in 1966, the Cultural Revolution was initiated and all urban schools were closed after June 1966. Primary schools resumed in October 1967, while many Junior Secondary Schools did not resume until the fall of 1968. Senior secondary schools resumed in September 1971, and grew in number from 500 to 4000 schools by 1972. The numbers of new enrolled students and full-time teachers in 1972 were more than double compared with situations in 1971 for urban areas. A small number of universities, all of which having been closed since 1966, gradually began reenrolling students after 1972. The majority of colleges did not formally reopen until October 1977, the year in which the National College Entrance Examination reinstituted. Hence, secondary schools and above were shut down for relatively longer periods.

[Figure 1]

Considering both the exposed population and the length of school closures, the closure of

secondary schools should have had a greater impact. As consistently illustrated in Figure 1, the completion of senior secondary schooling has been significantly affected. The increasing trends of senior and junior high attainments have been obviously disrupted for cohorts at school ages during this period (especially for birth cohorts: 1947-1959). Based on the regular age to attend or being attending secondary schools and the timing of the closure of schools, an index "Closure" for measuring the intensity of being treated over birth cohorts is constructed as follows:[2]

$Closure_{ij}$ = 6 if individual i was born in the birth cohort j: j =1952-1954
4 if individual i was born in the birth cohort j: j =1950-1951, 1955-1956
1 if individual i was born in the birth cohort j: j =1948-1949, 1957-1958
0.5 if individual i was born in the birth cohort j: j =1947, 1959
0 otherwise

Unless specified otherwise, the subscript j always represents the birth year and i represents individual i in this paper. The value of the index can approximately be interpreted as how years of formal secondary education have been denied for cohort j. Birth cohorts of 1952-1954 are identified as the potentially most treated group because their junior and senior secondary schooling have both been disturbed. The second group (birth cohorts: 1950-1951; 1955-1956) partially received the educational interruptions at the secondary school level. The third group includes children born between 1957 and 1958 and those between 1948 and 1949. They were marginally affected either in their senior secondary schooling or primary schooling, and both were delayed in their potential college entrance. Grade repetition and early or delayed school entry could lead to bias in estimations if they are mistakenly considered to be treated or non-treated. Therefore, birth cohorts of 1947 and 1959 are also taken into consideration. A summary of this measure is presented in columns 2 of Table 1.

Aside from the closure of schools, the length of schooling and the substance of education were also affected. For some regions, the length of each schooling level had been shortened by half a year or one year.[3] The substance of education was transformed into a half-working and half-studying style. Admission policies also deviated from being academic merit-based. For example, colleges selected students from specific social classes without any academic merit

[2] Basically, the principle to categorize the birth cohorts is from the most to the least affected. Different scales for the measure of Closure have also been considered for robustness checks. For example, I rescale the groups using 0-0.5-1-2-3 as well as 0-1-2-3 according to their different treatment intensities, instead of 0-0.5-1-4-6. In all, the empirical results are qualitatively consistent.
[3] For example, primary schooling was cut from six to approximately five years. Meanwhile, each level of secondary schooling was reduced to 2-3 years. College was also shortened to 2-3 years in some regions.

criterion: workers, peasants and soldiers. These changes caused a downgrading of academic standards and an emphasis on political qualifications (Chang, 1974).

Additionally, due to the large geographic scope of China, the intensity of educational interruptions varied across rural and urban areas. With the goal of reducing gaps between rural and urban areas, the experience in rural areas was quite different. First, there was no such large scale closure of schools in rural areas as occurred in urban China (see Appendix A for administrative statistical evidence). Meng and Robert (2003) have provided empirical evidence for that the exposed rural children were not as significantly affected as their urban counterparts by the closure of schools. Secondly, Anreas et al. (2004), Han et al. (2001), Thogersen et al. (2002) and Zhang (2012) even mentioned that there was an expansion of middle schools in some rural areas between 1972 and 1978. Therefore, my evaluation particularly focuses on the permanent urban residents, while the rural residents will be used for placebo tests.

2.2 The Send-Down Movement

The major period of the Send-Down Movement was from 1968 to 1978 and it was implemented nation-wide. At the early stage of the Cultural Revolution, the sent-down youth included a small group of adult social elites with higher education as well as young adults from families with particular social status ("chengfen"). During the major period, the major population to be rusticated were the current students or graduates from secondary schools. Specifically, the highly exposed cohorts are those who were born between 1946 and 1961 no matter in which province (see Table 1 and Appendix B). Details of the sending policy varied across regions and kept changing over time. For some regions, the local governments required at least one child from each family be sent to a rural location. Meanwhile, some cities set up a criterion that only one child must be sent. An extreme case was Wu Han city in Hubei province, in which the government sent all age-eligible youth to the countryside in 1974 (Bernstein, 1977). Returning policy also varied across regions and over time. At first, returns sparsely started since 1973 but were limited before 1978 (Deng, 1993). After 1977, the returns of the sent-down youth became common and most of them returned to their original locations.[4]

Different policies and bargain power of families make the duration of staying in the rural area vary among the sent-down youth. On average, the older birth cohorts were likely to be

[4] Those who were married with local residents or worked in local government might have never returned (Li, et al., 2013; Xie, 2008; Zhou et al., 1999).

sent-down earlier and stayed longer in rural areas compared with the younger birth cohorts (See Appendix A for more empirical evidence). During their staying, all of the sent-down youth were forced to live with farmers, perform manual labor and spend years in rural areas. There were various exposures during their staying. Firstly, they might have performed different economic activities because of their own capacity or family background. For example, the sent-down intellectuals could also work as part-time teachers in rural schools aside from performing manual work when they were staying in the countryside. some might be assigned to harsh manual work. Secondly, masses of geographic factors and demographic factors in rural areas also endowed abundant heterogeneities across the sent-down population. Different living environments might be with less resources or less social conflicts compared with urban areas. A small group of sent-down youth even could continue schooling in some rural areas (Xie et al., 2008). Additionally, because of different adaptive capacity across individuals, those children might also develop differently during their staying. Overall, this policy altered their life course, affected their human capital accumulation, not only in the way of receiving formal schooling but also accumulating working experience, and further shaped their future economic opportunities.

In Appendix B, I examine determinants of being sent-down or not. Estimation results show that the probability of being sent is highly correlated with family background. Considering the selection problems and various exposures during staying caused by individual heterogeneities, the simple comparisons between sent-down and non-sent-down urban youth in the existing literature might have captured biased estimations of the Send-Down Movement. Even for the study of comparison between twins, it still has its inabilities, not only from the limitations of twins data (e.g., limited observation and twins unobserved heterogeneities), but also from the selection within family and the heterogeneous lives in rural areas for sent-down youth. The positive marginal effect of staying one extra year among twins might purely capture the subsequent evolvement of adaptability or performances of the more able twin.

Correspondingly, I calculated the probability of being sent-down and average length of stay at cohort level separately and constructed their product, "Send-Down".[5] This measure gauges the expected length of staying in the countryside reflecting the intensity of being treated by the Send-Down Movement over birth years. It, to some extent, alleviates the selection bias and

[5] I also consider three variations: the probability of being sent, the average length of stay in countryside and provincial differences. In this way, the measure of Send-Down is the product of the average probability to be sent and the average length of stay for individual i born in birth year j in province o. Qualitatively consistent results have been obtained with the different magnitude.

potential measurement errors at individual level.

$\text{Send-Down}_j = P_j L_j$

P_j : the probability of being sent-down for the birth cohort of j;

L_j : average length of staying in the rural area for the birth cohort of j.

[Figure 2]

Figure 2 visually describes the measure based on individual dataset of CHIPS 2002. Compared with other cohorts, the birth cohorts of 1946-1961 were more likely to be rusticated and have a larger Send-Down value, longer expected length of staying in the rural areas.

2.3 The Measure of the Cultural Revolution

[Table 1]

I further constructed a single binary variable (CR) to capture the overall impact on the affected cohorts. As discussed, this paper focuses on school-age groups during the Cultural Revolution, who were at the prime stage of human capital and relatively vulnerable to surrounding environments. CR=1 for agents born between 1946 and 1961.[6] The control group is younger and older birth cohorts without interruptions to their human capital accumulation during the Cultural Revolution.

Given the identified affected birth cohorts (1946-1961), the Great Famine (1959-1961) might be one confounding factor.[7] Although it impacted the rural areas directly, the Great Famine also marginally affected the urban areas. Without controlling it, the resulting estimates might be biased. Therefore, I constructed a discrete variable, Famine, to control for its effects, based on how many years each birth cohort was exposed to the Great Famine during their infanthood (Age 0 to 2; See column 7 of Table 1).

3. Theory and Empirical Model

It is common wisdom that the individual life-cycle earning profile commonly follows an inverse U-shape pattern, increasing during the working lifetime and declining later at the range of retirement ages (Deaton et al., 2000; Modigliani, 1986). Similar hump shapes of age-earning

[6] This identified group is the same as the existing literature (Li , 2013; Meng, 2003; Xie, 2008; Zhang, 2007); Other specifications have also tested, for example birth cohorts 1946-1959 as well as 1947-1961.

[7] According to the literature, experiencing famine during infanthood is likely to have a long-term effect on individuals' future performance. Meng and Qian (2009) show that in-utero and early childhood exposure to the Great Famine had large negative effects on adult health condition, educational attainment and labor supply in rural areas.

profile are widely documented in empirical literatures examining cross-sectional data. The cross-sectional profile also works as a surrogate for a individual life-cycle profile in nonstationary economies with increasing productivity growth over birth cohorts (Irvine, 1981). Given a growing economy as China, the Cultural Revolution has severely interrupted the human capital accumulation for a range of birth cohorts. The permanent loss in human capital will lead to deviations from the bump-shape profile because of breaking the increasing dynamics of cohort productivity growth over birth year.

Follow Shorrocks (1975), it is assumed that individuals complete formal human capital formation at age of 25 and start to work for earnings. The earnings of the representative individual born in cohort j in year t in a cross-sectional profile is denoted as follows:

$$I(t, j) = \begin{cases} = 0 & \text{if } 0 \le t\text{-}j \le 25 \\ = h\, f(t\text{-}j\text{-}25)\, e^{k(j)} & \text{if } t\text{-}j \ge 25 \end{cases}$$

h represents the common resources to all generations. f(.) is a concave function of age which also can be represented by a polynomial function of age. k(j) represents the cohort productivity growth for cohort j. The cohort effect in the regressions for the log income increases almost linearly with the year of birth over the generations (Jappelli, 1999). One prime determinant is the increasing trend of human capital production over time (e.g. education attainment) proved by rich empirical literature (Mincer, 1996 and 1997; Jappelli, 1999). Given the generation-specific productivity growth and without disturbances, the cross-section age earning profile can be reduced as a pure age effect when exhorting all the generation-specific resources (King and Dicks-Mireaux, 1982). From this aspect, cohort productivity growth reveals the pattern of generation-specific resources which contribute to their human capital accumulation. Aside from productivity growth, the cohort effect can also reflect heterogeneities of preferences and mortality rates across birth cohorts (Shorrocks, 1975; Masson, 1986; and Jappelli, 1999).

Based on the above theoretical framework, without interruptions or uncertainties, the cohort productivity growth should be increasing over the year of birth and the life-cycle earning profile should exhibit the widely observed inverted U-shape. If particular generations experienced adverse interruptions during human capital production, the positive correlation of cohort effects with year of birth is broken and it gives rise to deviations from the life-cycle model. In other words, we can introduce cohort-level productivity disturbances into the model when large-scale interruptions destroy generation-specific resources and permanently cause loss in human capital

of a particular range of cohorts. Therefore, I can identify the impact of this plausible natural experiment, the Cultural Revolution, by testing the predictions of the life-cycle model using cross-sectional micro-data.

Considering the far-reaching influences and complexity of the Cultural Revolution, my baseline estimating model to evaluate the existence of the impact is

$$Y_{ij} = \alpha + \beta \text{Policy}_{ij} + \delta_1 \text{age}_i + \delta_2 \text{age}_i^2 + \delta_3 \text{Gender}_i + \delta_4 \text{Province}_i + \delta_5 \text{Famine}_{ij} + \varepsilon_{ij} \quad (1)$$

where the dependent variable Y is the natural log of annual income[8] for individual i of cohort j. *Policy* represents the Cultural Revolution which is measured by three alternatives (CR, Closure and Send-Down). They capture different intensities of exposure to policies across cohorts (See section 2). Other independent variables include age, age squared, gender, and provincial indicators. In addition, the Great Famine is also taken into consideration for an accurate estimation concerning mortality influence and potential contaminations. The coefficients of the three measures are of interest and consistent estimates will indicate the qualitative and quantitative effects of the Cultural Revolution.

Moreover, with repeated cross-sectional datasets (CHIPS 1995 and 2002), I can track the same cohorts over time and examine the difference between the affected cohorts and the control cohorts. In the theory of human capital production (e.g. schooling and working skills), the exposure can also result in differences in slopes of life-paths of earnings among population, especially in response to additive macroeconomic environments. Hence the second proposition is to examine how the impact changes over time as Chinese market economy increasingly evolved. In a more market-driven economy, workers should earn closer to their marginal product to labor so that the negative impacts should increase.

Thirdly, I will further study the possible channels and identify how the Cultural Revolution made the generation different using extended models of equation (1). Following the basic technique to uncover the mechanism (Nunn, 2008), I control for individuals' characteristics in the regressions one by one and analyze how the interested coefficients change. The pattern of changes interprets the mechanism and shows how the Cultural Revolution affected the population through particular micro-perspectives. In other words, the baseline regressions are extended by controlling for different channel variables: education attainment, current marital

[8] In this paper, I compute the average annual income between 1993 and 1995 as well as between 2000 and 2002 to measure the individual's permanent income at early 1990s and 2000s respectively, for taking the measurement error into consideration.

status, work experience, schooling years, health status, preferences, etc., one by one.

After controlling one specific channel, the interested coefficients should increase with smaller absolute value if the Cultural Revolution impacts negatively through this channel or vice versa. For example, children affected by the Cultural Revolution have lower educational attainments and were thereby likely to earn less. After controlling for this channel, absolute value of the interested estimates will shrink. Based on patterns of changes, dominant channels can be identified. The interested estimates would turn to insignificant if the complete mechanism can be captured. Furthermore, I will examine subsamples of different control groups, control for family background and utilize datasets of rural residents as well as rural-urban migrants to make placebo tests for robustness checks.

4. Data and Statistics Descriptions

4.1 Data

This paper draws mainly on data from the CHIPS which is a nation-wide and representative survey.[9] It has designed multiple questionnaires and provides rich information on permanent rural residents, permanent urban residents and rural-urban-immigrants at household level as well as individual level. The urban sheet of 2002 wave randomly selected 20,632 permanent urban individuals and 6,835 urban households from 12 provinces. Most importantly, it includes Send-Down experience at individual level, such as whether one was rusticated and how long one had stayed in rural areas, which makes it possible to measure this treatment. Aside from its credibility and capacity, another advantage of this dataset is that the identified cohorts belong to working age population, while the most recent datasets might fall short of requirements for the interested cohorts were out of labor force.

To answer the question whether there is persistent effects of the Cultural Revolution and the mechanism of its impact, the urban data of CHIPS 2002 is utilized. It contains a wide range of demographic and economic variables. Firstly, it provides detailed information about personal annual income[10] in 2002 and retrospectively for 2000 and 2001. I take the average of the three

[9] This survey is funded by the Ford Foundation and institutions from multiple countries. Its funding agencies are as follows: the Chinese Academy of Social Science, the Asian Development Bank, City University of New York, Leverhulme Trust (United Kingdom), Columbia University and the University of California, Riverside. Other data resources are also referred: CHIPS 1995, CHIPS 2007, CFPS 2008, Chinese Statistics Yearbooks, and the 1990 China Census.

[10] The total annual income contains regular wages, bonuses, other revenues from working units and kinds of subsidies from other sources. Missing observations in income are dropped and the proportion is lower than 3%. All results are robust and consistent when taking out all kinds of subsidies and only considering regular wages and money in-kinds from working units.

years' income as the dependent variable. Also information about current employment status , current marital status, occupations and years of schooling for exploring channels is provided. Guided by the theoretical framework, I narrow the empirical sample to permanent urban residents at ages of 25-60. Individuals without completing human capital accumulation (full-time students) or older than the retirement age (60) are excluded. To answer the question that how the impact changes over time, I resort to CHIPS 1995. The same strategy for sample is applied to permanent urban residents from wage of 1995. In addition, Chinese Family Panel Studies (CFPS) of 2008, CHIPS 2007 and Study on Global Ageing and Adult Health 2007 (SAVE) are utilized for exploring channels of health and attitude in the transmission mechanism of the Cultural Revolution.

4.2 Statistics Description

[Table 2-A]

As presented in Table 2-A, from the mid 1990s to early 2000s, annual income of urban residents has increased by 85.6% with a larger deviation as the market-oriented Chinese economy rapidly grows. One average, the older birth cohort group earned more compared with the younger cohorts group. Interestingly, compared with older and younger cohorts, the rate of income growth for the affected group (Birth cohorts: 1946-1961) is lower from early 1990s to early 2000s. Similarly, natural log income of the interested cohorts has increased by 5.8%, while that of the other two control groups grows more than 6.5%.

For the wave of 2002, the full empirical sample is 12,304 observations. Approximately 50% of the sample are female and 20% report the experience of being sent-down. For the sent-down youth, the average length of their stay in rural areas is approximately 4 years. Natural log annual income of year 2000 to 2002 is 8.966 on average, while the average years of schooling are proximately 11 in 2002 urban China. One problem arises from the missing information on the working experience and occupation for those who are currently unemployed. This is associated with the implementation of the survey in which they skip the question for the unemployed population. Therefore, I examine the current employment status for the full sample as one channel and further study the channel of working experience for the subsample of employed population.[11]

[11] For the employed population, the sample size is 9637. I also apply multiple imputation approach (Rubin, 2002) to fill in missing values of working experience based on observed information matrix and consistent results are found.

Group statistics is also shown in Table 2-A. The control group are younger than the treated group. On average, the treated group is at age of 48 and the employed sample of this group has worked for 27 years. The sent-down youth have more working experience and on average works for 28 years. The control group is on average 37 years old and for the employed sample of this group, they have been worked for 15 years. However, the statistics of working experience based on the wave of 1995 hasn't shown significantly difference between groups. Looking into the current employment status, it includes types of currently being employed, unemployed, laid-off and retired. Retired as well as laid-off population is larger for the treated cohorts compared with the control group. Generally, it follows the life-cycle profile: the older the cohorts, the more working experience they possess and the more they retire. Females observations accounts for 50.6% of the control group, while 48.6% of the treated cohorts. Examining the education attainment across groups, the treated cohorts obtain 1.4 less schooling years than the control group. The statistics of current marital status shows that the treated group has more observations who have experienced divorce.

Aside from datasets of CHIPS 1995 and 2002, the summary statistics of other data sources are also presented to check other outcomes (see Table 2-B). It shows that the proportion of smokers is higher in the interested group than the control group based on CFPS 2008. Group comparison of average height shows that the treated cohorts are slightly shorter than the control group based on CHIPS 2007. Looking into the average ages of stopping working for pay, the data of the survey of Study on Global Ageing and Adult Health 2007 (SAVE 2007) shows that the treated cohorts are more likely to leave the labor market. Mean comparison shows that the treated group believe that personal luck is very important in determining individual's success but T-tests hasn't shown significant difference. Overall, individuals' attitude towards determinants of success (diligence against personal luck) is positively related with year of birth. So is divorce experience. And contemporaneous comparison between the sent-down and non-sent-down youth within birth cohorts 1946-1961 shows that sent-down youth are significantly more marital instable.

[Table 2-B]

In the next section, estimation results will be presented. To visually illustrate the Cultural Revolution's effects on shaping life-cycle profile firstly, I graph the coefficients of age indicators from two basic regressions using CHIPS 2002: regressions of log income and schooling years on

gender, age indicators and region indicators (See Figure 3). In Figure 3, two vertical lines highlight the interested cohorts. The right and left axis represent coefficients from the two regressions separately. As it shows, there is an overall increase trend for the education attainment overtime but with a dip at the range of the affected cohorts. The pattern of cohort effects in the regression of income exhibits a quasi-bumped pattern over the age profile but similarly with a dip for the interested group. This violations against the positive relation between cohort productivity growth and year of birth as well as the inverted U-shape of age-earning profile visually imply the existence of the impacts of the Cultural Revolution.

[Figure 3]

5 Estimation Results

5.1 The Impact on Income

The results of empirical model laid out in equation (1) are presented to show the existence of the long term impact in Table 3 and examine how the impact changes over time in Table 4. Different estimations of interest are obtained utilizing different measures for the Cultural Revolution separately. In all of the regressions, the fixed effects of regions, gender, the effect of the Great Famine and life income profile (age and squared age) are controlled. Note that the interested estimates, regardless of which measures of the Cultural Revolution or which cross-sectional life-cycle profile is adopted, are significantly negative.

Our main focus is the impacts at early 2000s. The estimate of CR indicates that the affected cohorts have been lowered their average annual income by around 11% (see regression (1) in Table 3). Aside from the measure of CR, estimates of Closures and Send-Down also are negatively significant. Empirically, one year of secondary schooling denied decreases the affected observations' annual income by approximately 2% at the early 2000s. As for the role of the closure of schools, being interrupted frequently in the advancement of formal education on average lowers earnings of the affected children by 2.7% for the empirical sample (-1.8%*1.5; 1.5 is the average years of schooling denied for the treated cohorts). The magnitudes of interested estimates imply a stronger and statistically negative influence of the Send-Down Movement. On average, the Send-Down Movement lowers income of the affected population by -4.8% at the 2000s (-6%*0.195*4.09; -6% is the coefficient of the estimate; 0.195 is the proportion of the full sample has been sent-down; 4.09 is the average length of stay) among the full empirical sample.

Compared with the closure of schools, the effect of the forced immigration is almost doubled. Furthermore, to study the simultaneous policies in terms of multiple controls, three measures or two measures are simultaneously controlled. Estimate results shows that at least one of the measure keeps significantly negative for both waves of dataset. It implies that the negative effect strongly persists not only through the policies measured (the closure of schools and the Send-Down Movement) in this paper but also other specifics of the Cultural Revolution. The above conclusions are consistent when the probability of being sent-down in 2002 is instrumented with that of 1995 wave.

[Table 3]

However one may argue that the economic environment might have varied and the interested estimates may mainly capture the effects of changes in macroeconomic environments, rather than the role of the Cultural Revolution in shaping the generation-specifics. CHIPS 1995[12] is explored for this concern as well as for examining how cost of the Cultural Revolution evolves in response to macroeconomic environment changes. As shown in panel A of Table 4, I examine the age-earning profile at two points of time and it shows that the Cultural Revolution significantly lowers the subjected children's average annual income by 9.1% at the mid 1990s (see, regression 1). Compared estimates of CR, the negative effects are amplified by 20% from early 1990s (-9.1%) to 2000s (-10.9%). The birth cohorts of 1942-1970 are studied in panel B. The changes of interested estimates consistently shown a substantial increase of the negative impact. The coefficient of CR changes from 6.1% to 10.3%. This amplification can be associated with the fact that as the Chinese market economy has increasingly evolved, factor returns are more determined by their marginal productivity in the market. Historically, China started to transit to a market economy after the end of the Cultural Revolution (1979). After 1980s, the market-oriented economic reform gradually deepened and induced rapid economic growth in China. The affected cohorts have been placed disadvantage positions as the result of various interruptions in human capital accumulation during the Cultural Revolution.

[Table 4]

In all, the negative effects are consistent with the fact that Cultural Revolution interrupted human capital production thereby led to lower earnings in the current urban China. All the

[12] Note that no information on length of staying in rural is reported in CHIPS 1995. Hence, the Send-Down is computed based on the average duration at cohort level merged from CHIPS 2002. For robustness checks, the probability of being sent in one wave has been instrumented by the other wave respectively. Consistent conclusions are obtained.

evidences prove the existence of a long-lasting negative effect of the Cultural Revolution on permanent income of the affected generations and this negative impact was amplified as Chinese market economy increasingly evolved. In addition, estimates show a stronger role of the Send-Down Movement in lowering the affected cohorts' income compared with the closure of schools. This stronger role is also proved by different specifications with multiple controls and principal factor analysis (PFA).

5.2 The Transmission Mechanism

To explore the channels driving this negative impact, I proceed to estimate extended empirical models of equation (1) in the spirit of Nunn (2008). Specifically, I introduce productivity determinants (e.g. educational attainment, work experience, and health), marital status and revealed preference one by one to investigate how the treated population developed differently. The main estimation results for the full sample are presented in panel A of Table 5 from the regressions (1) to (6). Three measures (CR, Closure and Send-Down) are controlled respectively.

[Table 5]

The primary factor of human capital, schooling years, is controlled in regression 2 and regression 3 contains current employment status. Further, the current marital status is included in regression 4. In column 5, a proxy for health, the average height at cohort level, is controlled and provides a quantified estimate of the health condition. I also compute cohorts' attitude towards the role of personal luck and working hard in determining individual success and control it in regression 6 to explore the channel of cohort-specific preference.[13] Panel B presents the estimation results within the subsample of employed population. Instead of current employment status, working experience and occupation are available and examined for this subsample. In the following paragraphs, I will discuss specific channels through which the Cultural Revolution matters in details.

Channel of Education Attainment

As a result of the Cultural Revolution, all levels of schools were closed and there were campaigns against intellectuals as well as social elites. Also, the rustication movement disrupted regular attendance for formal schools. The subjected individuals thereby acquired fewer years of

[13] Information about preference and health hazard are merged from CFPS 2008 and CHIPS 2007 respectively.

schooling[14] and was placed in disadvantages in the labor market. From the demand side of labor market, educational completion is the primary signal for ability, skill and knowledge. Hence, this loss turns to be an important and permanent channel through which the Cultural Revolution affects the subjected cohorts' current average income. The overall effect of the Cultural Revolution no matter which measures are adopted, is reduced by more than 50% (See panel A; from -10.9% to -5.4% for measure of CR; from -1.8% to -1% for measure of Closure; from -6% to -2.3% for measure of Send-down). Note that estimates of Closure become insignificant or trivial as long as the education attainment is controlled for. Considering the intergenerational transmission mechanism, the Cultural Revolution potentially has caused more far-reaching influences as the results of the fundamental anti-intellectual atmosphere. In addition, cross-countries placebo tests have been done to show that the impact of the unusual closure of schools on affected cohorts' human capital accumulation is causal (see Appendix C).

Channel of Working Experience

Limited by the survey, current employment status is examined for full sample while years of being employed and occupation are tested for employed subsample. There are several classes of employment status in the 2002 wave of CHIPS. It contains: currently being employed, unemployed, retired, special status and others.[15] The estimate of CR changes from -5.4% to -4.5% when I control the current employment status. It indicates that the Cultural Revolution impacts the interested cohorts negatively through this channel, current employment status. Individuals among the treated group are more likely to be retired, laid-off and unemployed. I also utilize the survey of Study on Global Ageing and Adult Health 2007 to analyze the intensive margin in terms of average age to stop working for pay. The computed results show that the subjected group was likely to stop working for pay and leave the labor force earlier than the other cohorts, no matter for the female or male sample (see Table 2-B and Appendix C).

For the subsample of employed population, the coefficient of CR changes from -7.2% to -6.8% and the Send-Down changes from -4.4% to -4.2% when I control their years of being employed in regression 3 of panel B. From regression 3 to 4, the estimates keep shrinking when

[14] A placebo test has been done across three Asian countries and convincing evidences prove the credibility of the loss in education attainment for the interested cohorts. Group comparison between urban and rural areas also shows that a loss in schooling years for the interested cohorts. Please see Appendix C. Meng (2003) and other researchers also found empirical evidences supporting this conclusion.

[15] The special status includes people who have got "Laid-off", or currently "Lixiu". These special groups are more likely to happen in state-owned sector and probably caused by the state-owned enterprises (SOEs) reform to deepen reform of the market oriented economy after the late 1990s. They are given related subsidies and compensations. In robustness check, I focus on regular wage and examine the long term impacts. Consistent conclusions are found.

controlling types of occupations. The changes imply that the Cultural Revolution has played a negative role for the affected population through the channel of working skills. In fact, the sent-down youth have on average two more years of employment compared with the not sent-down youth (CHIPS 2002) at each cohort level. It is because the educational system reform and the forced immigration to rural areas both led to early entry into the labor market. However, early entry has contributed to more working experience but might lead to a lower-paid path caused by insufficient educational attainment. Moreover, the sent-down youth spent years in rural areas and their accumulated working skills might be unfit for the demands of the later urban market. Also, living in rural environment and doing manual work might have affected their working skills through increasing health hazard. In Appendix D, I utilize the 1995 wave of CHIPS to examine the same birth cohorts within employed population and find a consistently negative role of the Cultural Revolution plays through this channel. Thereby, if data allows quality-adjustment for the variable of working experience, their real work experience would be lower and we can obtain more accurate understanding of the channel of working skills.

Channel of Marriage Life

The current marital status, an indicator for different outcomes of current marital status, is controlled to quantify the effect of this channel. While it is commonly argued that a better matched marriage or stable relationship can enhance efficiency, marital instability (for example, separations and divorces) will contribute to more uncertainties and depressed economic performance. Although the current marital status is different from marriage history, it still can give us an idea of this channel. According to our empirical results, the individuals' current marital status accounts for a part of the overall negative effect of the Cultural Revolution on current earnings (panel A: from -4.5% to- 4.4% for CR; and from -2% to -1.9% for Send-Down).

Resorting to different datasets with marriage history (e.g., data from CFPS 2008), statistics show that marital lives of the impacted cohorts are more instable, for example more divorce experience and separations. On average, the sent-down youth hold 2% higher divorce rates than their counterparts (source: CFP 2008; see Table 2-B). There are several mediators for their marital instability caused by the Cultural Revolution. Firstly, disturbing environmental factors psychologically influenced the interested cohorts' commitments to relationship. Secondly, interruptions and uncertainties had increased their searching cost in urban marriage market, especially for those sent-down youth who returned to cities after years. One direct consequence

is that overall the interested cohorts' first marriages are on average two years later than the before and after cohorts. The last but not the least, separations caused by the Send-Down Movement and policies that prohibited the sent-down youth who married with the local residents to return had directly led to divorces.

Channel of Health

The average height at cohort level by gender is controlled as a health proxy to provide a quantified estimate for the channel of health condition (see regression 5 in panel A and regression 6 in panel B). The estimates, no matter of which measures, haven't significant changed in panel A. But for the employed subsample, the estimate of CR implies a negative impact on affected cohorts' health condition (It changes from -3.8% to -3.6%). Since the synthetic cohort approach hasn't provided a clear picture of this channel, I turn to other pieces of evidence to illustrate potential effects of the Cultural Revolution through this channel: violence experienced during adolescence could affect the subjected children's physical development; also, bad habits could have been cultivated by psychological depression during such a period. For example, the highly exposed cohorts have a high proportion of smokers compared with other cohorts (Data sources: the 1995 CHIPS and survey of the Study on Global Ageing and Adult Health, see Appendix C and Table 2-B); third, for the rusticated youth, when sent to rural areas, they were forced to live in a rural environment and perform manual labor (Li, 2013 and Zhou, 1999). Inferior environments might have hindered their human capital accumulation, e.g., lack of nutrition and harsh manual labor.

Channel of Revealed Preference

The last regression controls cohorts' attitude towards diligence against personal luck in determining success. For the full empirical sample, the estimate of CR doesn't change significantly (changes from -4.35% to -4.41%, see in panel A). Interestingly, the coefficient of Send-Down changes from -1.9% to -2.3% and it becomes more significant. For the employed population, the estimate of Send-Down also becomes more significantly negative after controlling this channel (changes from -2.3% to -2.9%, see in panel B). The patterns imply that the Send-Down Movement plays a positive role in the exposed observations' current performance through this channel. Life in rural areas has made the sent-down youth more perseverant and they utilized their diligence to conquer personal unluckiness.

To sum up, there are several conclusions based on the above results. Firstly, estimates of

interest consistently trend toward zero from the first to the last regression as additional potential channels are added, regardless of the measures (CR, Closure and Send-Down) or samples. Numerically, the impacts are larger within employed population on average (CR, 10.9% for the full sample and 12.2% for the employed subsample). Secondly, the changes in magnitudes of estimates indicate that education attainment is the most important channel, for it accounts for around 50% of the overall effect. Thirdly, there are channels unexplored in the mechanism because the interested estimates (CR and Send-Down) are still significantly negative in last regression for both panels. More information are needed to complete the mechanism by exhausting all of the possible channels.

5.3 Robustness Checks

The estimation results are consistent with our hypothesis: past adverse interruptions during the human capital accumulation process will cause violations against the predictions of the life-cycle model. It breaks the positive increase of cohort-specific productivity growth and negatively affects the subjected groups' current economic performance. In this section, the robustness of the above results is checked.

[Table 6]

I gauge the effects among different subsamples with different control groups to check the existence of the negative impact in panel A of Table 6. Firstly, I study a shorter age span with control groups of birth cohorts four years earlier and five years later (total empirical sample: birth cohorts 1942-1967) for both waves, which can be considered as contemporaneous comparisons. We consistently find that the subjected group significantly earned less on average (CR: -7% for the wave of 2002 and -5% for the wave of 1995) and Send-Down Movement plays a stronger negative role compared with the closure of schools. Both impacts increase from the 1990s to 2000s. Secondly, the subsamples with control group born after 1961 are considered. Estimates for samples of birth cohorts of 1946-1970 are also significantly negative. For the wave of 2002, the overall effect is -11%, while for the wave of 1995, it is -6.6%. Thirdly, a shorter age-span with birth cohorts of 1942-1970 are studied considering the population older than 25 in 1995 and younger than retirement age 60 in 2002. All the estimates of interest are significant and negative no matter which subsample and which dataset is gauged. In all, persistent negative impacts of the Cultural Revolution are found no matter which control group are controlled as well as no matter which points of timing are examined. Also, compared the impacts in 1995 with

2002, the effects are amplified over time.

I further examine the subsample with family background considering the potential selection bias and results are reported in panel B of Table 6. The survey provides family background information for household heads, for example, their parents' social status ("chengfen"), educational attainments and occupations. All these predetermined variables of family background are controlled in regressions simultaneously as well as respectively. Consistently, the significantly negative estimates of interest support the existence of the long-term impacts (-12.5% for CR; -1.3% for Closure; and -7.8% for Send-Down). Differences of the interested estimates between before and after controlling the family background show that, to some extent, backgrounds of households played a role.

[Table 7]

As discussed above, the rural residents experienced quite differently. Compared with permanent urban citizens, they haven't exposed to such intense human capital disruptions (large-scale of closure of schools and the Send-Down Movement). Meanwhile, from the 1990s to 2002s, annual income also largely increased for them because of the rapid growth in China. Therefore, it is expected that the Cultural Revolution hasn't significantly persistent effects on the cohorts in the rural areas. In Table 7, I make several placebo tests with rural-urban migrants and permanent rural residents from CHIPS 1995 and 2002.[16]

Firstly, the results of rural residents show that estimates of CR, Closure and Send-Down are all insignificant and close to 0. Note that income of rural households from agriculture production and other family production is recorded collectively at the household level. Therefore observations with non-farm individual revenue are examined. Secondly, as shown in Table 7, no negative impacts are found and the coefficients of interest are insignificantly positive for rural-urban migrants. The sample of rural-urban migrants works as a better counterfactual comparison because they migrated from rural areas after 1990s, currently work in the urban areas and share similar macroeconomic environments with the affected cohorts in the urban market. These insignificant estimates of interest obtained in all of the placebo-controlled studies provide convincing evidences supporting the causal effects of the Cultural Revolution on urban residents.

[16] Placebo tests across countries have also been done. For example, Census data at early 2000 of Brazil, India, Canada and US are examined. The coefficients of CR or Closure are either positively insignificant or slightly positively significant and close to 0. See Appendix D. I also graph figures of life-cycle coefficients in those countries similar as figure 2. No similar pattern as China has been found.

6. Conclusion

Along with the existing literature, this paper documents and examines the impacts of historical events on current economic developments by focusing on one specific historic event in one specific country (the Cultural Revolution in China). Specifically, I gauge the impacts of the Cultural Revolution by testing its micro-effects on individuals' average annual earnings, examine how the effects change over time from the 1990s to the 2000s and explore the channels through which the effects persist.

To accurately capture the impact, I designed three measures for the Cultural Revolution (CR, Closure and Send-Down) and utilized multiple datasets. Send-Down and Closure reveal different intensities of being treated at cohort level by two specific policy shocks: the closure of schools and the Send-Down Movement. In this way, selection bias and measurement error at individual level are alleviated. Also, the Great Famine is also controlled for to avoid contaminations.

Convincing evidence acquired indicates that a Cultural Revolution effect lowers urban residents' average annual income in the early 1990s and 2000s and the effect is amplified as the market-oriented economy increasingly evolved. Based on the results from CHIPS 2002, the magnitude of the negative impact on annual earning is approximately -11%. The coefficient of the closure of schools implies that the denial of one year of formal secondary schooling reduces the subjected individuals' annual income by approximately 1.8%, while the forced immigration (the Send-Down Movement) plays a stronger role in lowering current earnings by -4.8% on average within the empirical sample. The existence of long-term impacts is robust to contemporaneous population comparisons, to a variety of controls for family background and different subsamples. Placebo tests of rural residents as well as rural-urban migrants also support the existence of causal negative effect of the Cultural Revolution on the subjected population's permanent income.

I also study the mechanism through which the effect of the Cultural Revolution persists. Evidence from the extended models reveals that the Cultural Revolution has shaped many aspects of individuals' life courses: educational attainment, work experience, marriage history, health condition and attitude towards determinants of personal success. Among all of these explored micro-determinants, educational achievement is the major channel through which this social revolution currently affects individuals. Additionally, it is intriguing to find that the Cultural Revolution negatively affects income through the channel of health condition for urban

employed population and the Send-Down Movement has made the sent-down youth become more perseverant. Considering the complexity of the Cultural Revolution (which practically changed every aspect of the affected individuals' lives), the results also cast doubt on the existing empirical papers that simply use the closure of schools as an IV to measure the real return of schooling or conclude a positive effect of the Send-Down Movement.

There are still parts of the black box that remain unopened. Further questions requiring more study include: How did the Cultural Revolution change people's preferences and personalities? How did the Cultural Revolution continue to have effects through institutional persistence? Aside from the impacts on labor market performance, we also can explore the impacts of the Cultural Revolution on other economic outcomes, for example precautionary savings and consumption patterns.

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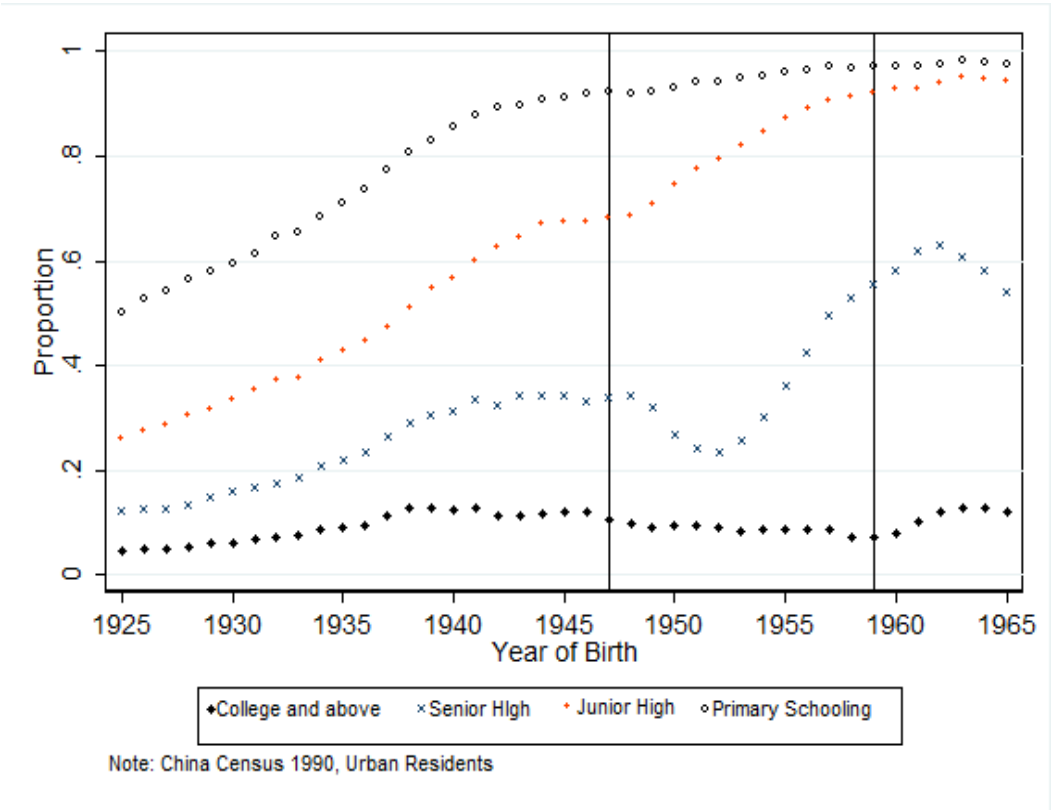
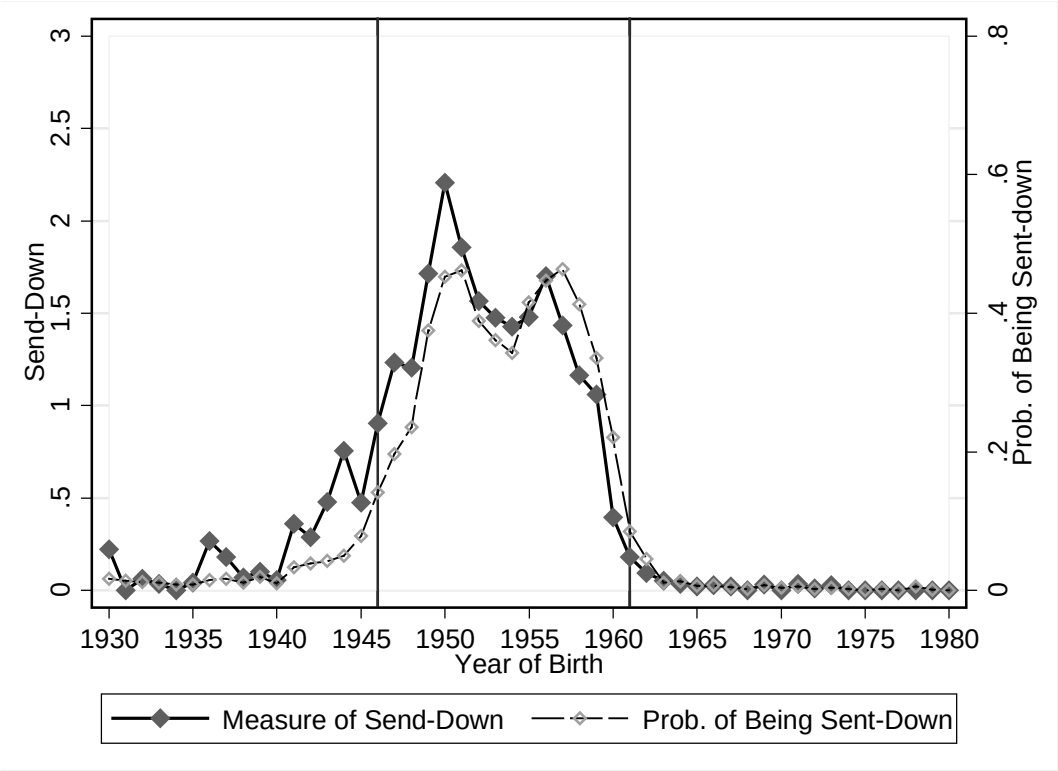
Figure 1: Education Attainment in 1990, by Birth Cohort and School Level



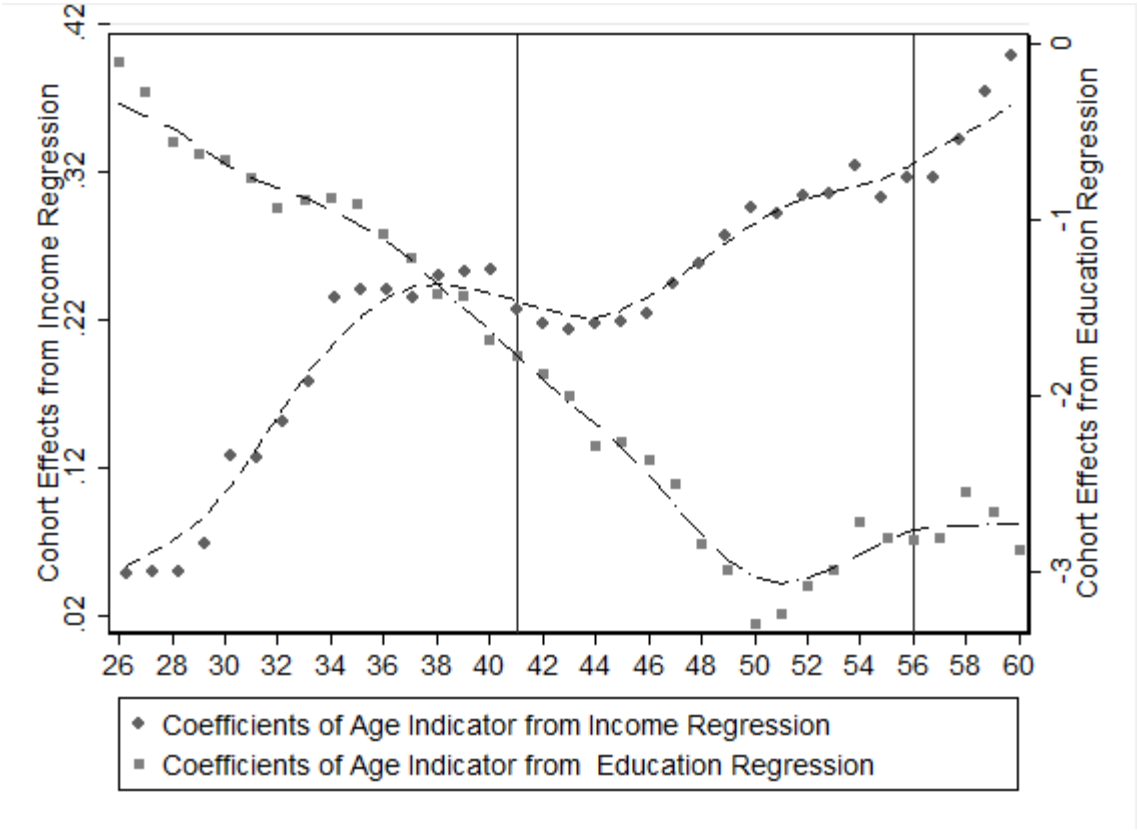
Data source: Urban Residents from China Census 1990. Consistent patterns are observed in our empirical sample of CHIPS 2002 (see Figure A-4 Appendix A).

Figure 2: The Intensity of Being Treated by the Send-Down Movement



Data source: urban residents of CHIPS 2002 and 1995

Figure 3: Deviations from the Life-cycle Model



Note: The scatters are the coefficients of the cohort indicators in the regression of natural log of income as well as schooling years on cohort indicators, gender and region indicators based on the empirical sample. And the coefficients are smoothen by taking three continuous cohorts' moving average for graphing. Two vertical lines highlight the interested birth cohorts.

Table 1: Methodology Summary

Interested Birth Cohort	(1) Age in 1966	(2) Years of Secondary Schooling Denied	(3) Probability of Being Sent-down (1995)	(3) Probability of Being Sent-down (2002)	(4) Length of Stay in Countryside (2002)	(5) Send-Down (1995)	(6) Send-Down (2002)	(7) Exposure to Famine at Age 0 to 2
1946	20	0	0.16	0.14	6.32	0.98	0.96	0
1947	19	0.5	0.18	0.21	6.22	1.05	1.29	0
1948	18	1	0.24	0.24	5.04	1.16	1.26	0
1949	17	1	0.40	0.35	4.90	1.80	1.82	0
1950	16	4	0.45	0.46	4.83	2.17	2.32	0
1951	15	4	0.51	0.41	4.44	2.39	1.92	0
1952	14	6	0.44	0.34	4.60	1.87	1.60	0
1953	13	6	0.41	0.31	4.77	2.04	1.50	0
1954	12	6	0.33	0.36	3.96	1.31	1.48	0
1955	11	4	0.42	0.42	3.67	1.50	1.52	0
1956	10	4	0.41	0.49	3.49	1.42	1.70	0
1957	9	1	0.49	0.44	3.25	1.55	1.47	1
1958	8	1	0.41	0.42	2.75	1.09	1.20	2
1959	7	0.5	0.34	0.33	3.24	1.07	1.07	3
1960	6	0	0.27	0.17	2.28	0.60	0.40	2
1961	5	0	0.10	0.07	2.63	0.27	0.19	1
Mean	--	1.5	0.214	0.195	4.09	0.85	0.79	--

Data sources: 1995 and 2002 waves of CHIPS (Chinese Households Income Project Survey) and values of measure "Send-Down" in 1995 are computed by the product of probability of being sent-down in 1995 wave and length of staying in the rural merged from 2002 wave because of lack of information in its wave. Details about empirical data will be presented in the coming sections.

Table2_A: Summary Statistics

Outcome Variables	**Older Group[a]**	**Birth Cohorts 1946-1961**	**Younger Group[b]**
Permanent Urban Residents			
Average Income	5683.420	5653.050	4665.320
(1993-1995) obs. 12581	(3739.89)	(3304.25)	(3055.239)
Average Income	10546.730	10444.070	9823.650
(2000-2002) obs. 12304	(7105.054)	(7550.042)	(7650.936)
Income Growth	85.6%	84.8%	110.6%
CHIPS 2002	**All**	**Control Group[c]**	**Treated Group**
(Urban Areas)	(Obs. 12304)	(Obs. 5637)	(Obs. 6667)
Log (Income)	8.966	8.920	9.010
	(0.95)	(1.03)	(0.87)
Age	43.12	37.241	48.100
	(8.72)	(9.01)	(4.23)
Female	0.495	0.506	0.486
	(0.50)	(0.50)	(0.50)
Schooling Years	10.944	11.685	10.318
	(3.1)	(3.10)	(2.95)
Sent-down Youth	0.195	0.015	0.347
	(0.40)	(0.12)	(0.48)
Current Marital Status (composition)			
Other	0.04%	0.07%	0.01%
Single	4.71%	9.81%	0.39%
Married with Spouse	93.18%	88.34%	97.27%
Separation[d]	2.08%	1.78%.	2.32%
Current Employment Status (composition)			
Other	0.46%	0.18%	0.28%
Employed	78%	83.98%	73%
Unemployed	2.8%	3.14%	2.5%
Retired	15.2%	9.12%	20.4%
Laid-off	3.7%	3.58%	3.8%
Work Experience[e]	21.025	15.077	26.777
(2002)	(8.95)	(7.18)	(6.36)
Work Experience	21.846	21.353	22.240
(1995)	(9.09)	(12.12)	(5.56)
Working Experience of Sent-Down youth			28.00
(for birth cohorts 1946-1961; obs. 1690)			(4.97)

[a] Older group includes birth cohorts of 1935-1945 for wave of CHIPS 1995 and birth cohorts of 1942-1945 for wave of CHIPS 2002 respectively.

[b] Younger group includes birth cohorts of 1962-1970 for wave of CHIPS 1995 and birth cohorts of 1962-1977 for wave of CHIPS 2002 respectively.

[c] Control group includes birth cohorts 1942-1945 and 1962-1977 in the wave of 2002, while for the wave of 1995, it contains birth cohorts 1935-1945 and 1962-1970. The treated group is the group of birth cohort 1946-1961.

[d] The group of separation includes observations who is currently divorced or separated from her or his spouse.

[e] Statistics summary for working experience only works for employed population of the wave of 2002.

Note: 1. Summary statistics in Table 2-A is computed based on CHIPS 2002 and 1995. Means of variables are shown with the standard deviation reported within the parentheses; 2. I also check income growth for samples with the same birth cohorts that older cohorts of 1942-1945 and younger birth cohorts of 1962-1970 for both waves. And consistent findings are obtained.

Table 2_B: Summary Statistics for Channels

CFPS 2008 (obs. 3948)	**All**	**Control Group**[a]	**Treated Group**
Attitude[b]	1.377	1.405	1.350
	(0.98)	(1.03）	(0.93)
Diligence	5.968	5.978	5.957
	(1.21)	(1.2)	(1.22)
Personal Luck	5.134	5.099	5.169
	(1.59)	(1.6)	(1.58)
Smoker[c]	0.317	0.309	0.325
	(0.46)	(0.46)	(0.47)
Divorce Experience[d]	0.041	0.043	0.039
	(0.20)	(0.20)	(0.19)
Divorce Experience of the Sent-Down Youth (obs. 378)			0.058
			(0.23)
CHIPS 2007 (obs. 9562)	**All**	**Control Group**	**Treated Group**
Height	165.112	165.394	164.708
	(7.67)	(7.49)	(7.89)
Female	159.545	160.025	159.224
	(4.98)	(4.66)	(5.34)
Male	170.873	171.495	170.409
	(5.36)	(4.94)	(5.8)
Weight	63.226	62.695	63.891
	(10.79)	(10.618)	(10.96)
Female	57.651	56.598	58.975
	(8.515)	(7.91)	(9.05)
Male	69.054	69.096	69.002
	(9.79)	(9.24)	(10.43)
SAVE 2007 (obs.2550)[e]	**All**	**Control Group**	**Treated Group**
Age of Stopping Working for Returns			
Female	50.241	52.724	49.37
	(5.56)	(4.73)	(4.42)
Male	53.795	57.067	52.149
	(4.74)	(4.13)	(5.47)

[a] Control group includes birth cohorts of 1942-1945 and birth cohorts of 1962-1977. Treated group contains birth cohorts of 1946-1961.

[b] Variable of Attitude represents attitude towards determinants of success (diligence of the importance for different factors is measured from 1 to 7. The higher the value is, the more important the individual values the determinant.

[c] Variable of smoker is an indicator showing whether one smokes or not.

[d] Only observations with marriage experience in the sample are considered.

[e] Data source is the wave of Study on Global Ageing and Adult Health 2007 (SAVE 2007). Control group one includes birth cohorts of 1942-1945 and the group treated cohorts is narrowed to be birth cohorts of 1946-1955 concerning the legal retirement age: 60 for male and 55 for female in 2007.

Note: 1. Means of variables are shown with the standard deviation reported within the parentheses; 2. Control group of birth cohorts 1935-1945 and 1962-1977 is examined and consistent conclusions are found.

Table 3: The Existence of Long Term Impacts

Variables Interested	CHIPS 2002 (1)	(2)	(3)
CR	-0.109*** (0.020)		
Closure		-0.018*** (0.003) ***[-0.027]***	
Send-Down			-0.060*** (0.014) ***[-0.048]***
R-squared	0.1	0.1	0.1
Obs.	12304	12304	12304

Note: 1. ***,** and * represent significance at 1%, 5% and 10%, respectively. The standard error is reported in the parentheses and adjusted for clusters in age controlling for age heterogeneity; 2. The three measures of the Cultural Revolution (CR, Closure and Send-Down) are examined separately from regression (1) to (3); 3. Control variables include gender, age, age squared, famine effects and province indicators. Dependent variable are natural log of individual's average annual income between 2000 and 2002; 4. For the closure of schools and the Send-Down Movement, the overall impacts among the full empirical sample are reported inside the brackets.

Table 4: The Changes of the Impacts

Samples	Panel A		Panel B	
	At Ages of 25 to 60		Birth Cohorts: 1942-1970	
Measures	CHIPS 1995	CHIPS 2002	CHIPS 1995	CHIPS 2002
CR	-0.091*** (0.027)	-0.109*** (0.020)	-0.061** (0.023)	-0.103*** (0.03)
Closure	-0.007* (0.004)	-0.018*** (0.003)	-0.007 (0.004)	-0.01 (0.005)
Send-Down	-0.068*** (0.02)	-0.060*** (0.014)	-0.033*** (0.01)	-0.04** (0.02)
R-squared	0.25	0.1	0.24	0.15
Obs.	12581	12304	10801	10896

Note: 1. ***,** and * represent significance at 1%, 5% and 10%, respectively. The standard error is reported in the parentheses and adjusted for clusters in age controlling for age heterogeneity; 2. The three measures of the Cultural Revolution (CR, Closure and Send-Down) are examined separately. For the 1995 wave, the average duration of staying in rural for the sent-down youth is merged from the 2002 wave to construct the measure of Send-Down because of the lack of information. Detailed information is shown in section 2; 3. Control variables include gender, age, age squared, famine effects and province indicators both in panel A and panel B. Dependent variable are natural log of individual's average total annual income between 2000 and 2002 or from1993 to 1995.

Table 5: Examine the Mechanism of the Cultural Revolution (CHIPS 2002)

Panel A:			**Full Sample Analysis**			
Regressions	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CR	-0.109***	-0.054**	-0.045**	-0.0435**	-0.0435**	-0.0441**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Alternative Measures						
Closure	-0.018***	-0.01*	-0.003	-0.003	-0.002	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Send-Down	-0.06***	-0.023**	-0.02**	-0.019*	-0.019*	-0.023**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Schooling Years		Yes	Yes	Yes	Yes	Yes
Employment- Status			Yes	Yes	Yes	Yes
Marital Status				Yes	Yes	Yes
Health					Yes	Yes
Attitude						Yes
R-squared	0.1	0.17	0.35	0.35	0.35	0.35
Obs.	12304	12304	12304	12304	12304	12304
Panel B:			**Subsample Of Employed Population Analysis**				
Regressions	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
CR	-0.122***	-0.072***	-0.068***	-0.051***	-0.038**	-0.036*	-0.035**
	(0.025)	(0.026)	(0.023)	(0.019)	(0.016)	(0.014)	(0.014)
Alternative Measures							
Closure	-0.017***	-0.009	-0.008	-0.006	-0.005	-0.004	-0.0001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)
Send-Down	-0.071***	-0.044***	-0.042***	-0.034***	-0.026**	-0.023*	-0.029**
	(0.014)	(0.014)	(0.013)	(0.012)	(0.012)	(0.01)	(0.009)
Schooling Years		Yes	Yes	Yes	Yes	Yes	Yes
Working-Experience			Yes	Yes	Yes	Yes	Yes
Occupation				Yes	Yes	Yes	Yes
Marital Status					Yes	Yes	Yes
Health							Yes
Attitude						Yes	Yes
R-squared	0.13	0.18	0.25	0.29	0.29	0.29	0.29
Obs.	9637	9637	9637	9637	9637	9637	9637

Note: 1. ****,**and * represent significance at 1%, 5% and 10%, respectively. The standard error is reported in the parenthesis and adjusted for 36 clusters in age; 2. Measures of CR, Send-Down and Closure are controlled respectively into empirical models; Marital Status is a grouping variable and represents different marital status in 2002. Health proxy is average height at cohort level merging from CHIPS 2007. Attitude reveals how relatively important individuals value diligence against personal luck in determining personal success at cohort level which is merged from CFPS 2008; 3. Working-Experience is how many year individuals have been working and missing indicator is controlled for 67 observations who haven't reported the information. Employment-Status is a status variable grouping being unemployed, employed, laid-off, retired and others in 2002; 4. Other independent variables: gender, age, age squared, famine and province fixed effects.

Table 6: Robustness of the Existence of the Impact on Income

Panel A	**Subsamples Examinations**					
	2002 CHIPS			1995 CHIPS		
Birth Cohorts	1942-1967	1946-1970	1942-1970	1942-1967	1946-1970	1942-1970
CR	-0.070*** (0.024)	-0.111** (0.04)	-0.103*** (0.03)	-0.05** (0.02)	-0.066** (0.03)	-0.061** (0.023)
Closure	-0.01** (0.004)	-0.01 (0.005)	-0.01 (0.005)	-0.003 (0.003)	-0.008** (0.004)	-0.007 (0.004)
Send-Down	-0.04** (0.01)	-0.02 (0.02)	-0.04** (0.02)	-0.025* (0.01)	-0.03** (0.01)	-0.033*** (0.01)
R-squared	0.13	0.15	0.15	0.2	0.24	0.24
Obs.	9878	10198	10896	10081	9748	10801
Panel B	**Controlling Family Background (CHIPS 2002)**					
	(1) No	(2)Yes	(3)No	(4)Yes	(5)No	(6)Yes
CR	-0.141** (0.04)	-0.125** (0.04)				
Closure			-0.017* (0.007)	-0.013* (0.007)		
Send-Down					-0.83*** (0.025)	-0.78*** (0.025)
R-squared	0.15	0.19	0.15	0.19	0.15	0.26
Obs.	3788	3788	3788	3788	3788	3788

Note: 1. Panel A tests subsamples of different age-spans from both waves of CHIPS. Panel B contains urban residents at age of 25-60 with respective parents' information in 2002. This subsample with family background is constructed by combining the household information with the individuals' data. Family background includes parents' occupation, parents' social status ("chengfen") and parents' education attainments; 2. Other independent variables are gender, age, age squared, effects of famine and regional fixed effect; 3. ***, **, and * represent significance at 1%, 5%, and 10%, respectively; The standard errors are reported in the parenthesis and adjusted for clusters in age.

Table 7: Placebo Tests within China

Data Source	CHIPS 2002			CHIPS 1995			CHIPS 2002		
Variables	Rural Residents 2002			Rural Residents 1995			Rural-Urban Migrants 2002		
CR	-0.015 (0.050)			-0.034 (0.075)			0.201 (0.163)		
Closure		-0.008 (0.007)			0.004 (0.013)			0.006 (0.035)	
Send-Down			-0.025 (0.030)			0.043 (0.051)			0.049 (0.108)
R-squared	0.27	0.27	0.27	0.36	0.36	0.36	0.16	0.16	0.16
Obs.	7369	7369	7369	3819	3819	3819	3407	3407	3407

Note: 1. Empirical sample of permanent rural residents includes observations that currently work and at age of 25 to 60. Total annual wage income and non-wage individual income (non-agriculture earnings) are computed as the dependent variable; 2. Empirical sample of rural-urban migrants includes migrants are that at age of 25 to 60 and migrated to urban after 1990s. Natural log of the total annual incomes are taken as the dependent variable. 3. Other independent variables are gender, age, age squared, effects of famine and regional fixed effect. For rural areas, the county fixed effects are controlled while for rural-urban migrants, birth place fixed effects are controlled; 4. ***, **, and * represent significance at 1%, 5%, and 10%, respectively; The standard errors are reported in the parenthesis and adjusted for clusters in age; 5. Full samples and various subsamples are examined for robustness checks, for example all population at age of 25 to 60 or longer age spans. And also regular wage is taken as the dependent variable and examined. Consistent findings are found.

Appendix

A. Evidences for Regional Heterogeneity

Because of limitation in the data, I only obtained the educational statistics after 1971. According to the Table A-1, Figure A-1 and Figure A-2, the rural and urban areas exhibit quiet different experiences during and after the Cultural Revolution.

Table A-1: The Changes between 1971 and 1972 for Senior High Education, by Region

Senior High Education		1971	1972
No. of Schools	Urban	500	4000
	Rural	9690	20485
Full-time Teachers (10,000)	Urban	7.29	15.9
	Rural	25.88	26.5
Students (10,000)	Urban	126.38	228
	Rural	344.85	474.6
Students per full-time teacher	Urban	17.34	14.34
	Rural	13.32	17.91
New Students Enrolled (10,000)	Urban	54.51	127.9
	Rural	212.11	262.5

Data Resources: Chinese Statistics Yearbook: 1949-2008

Figure A-1: Number of Senior Secondary Schools, by Region

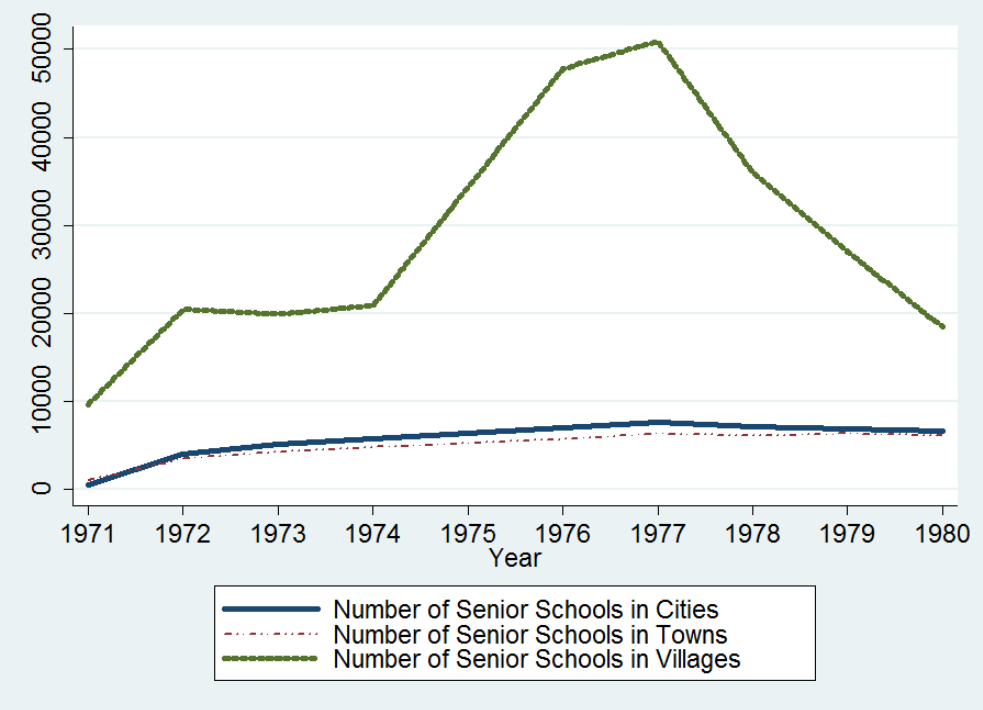


Figure A-2: Number of Junior Secondary Schools, by Region

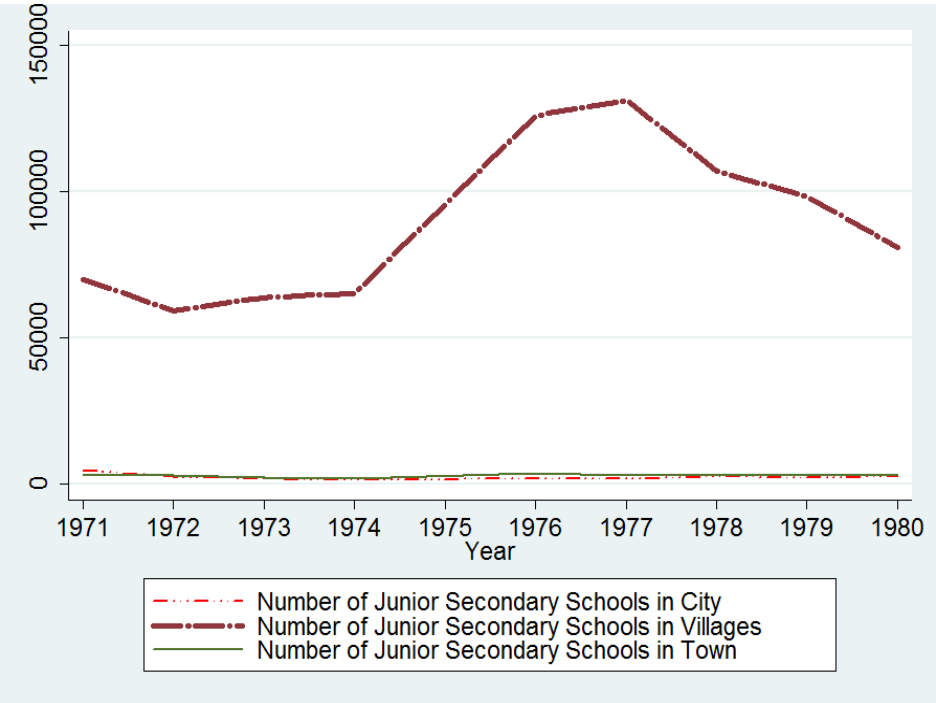


Figure A-3: The Ratios of New Students Enrolled and Number of Schools before the Cultural Revolution in 1965 (unit: %)

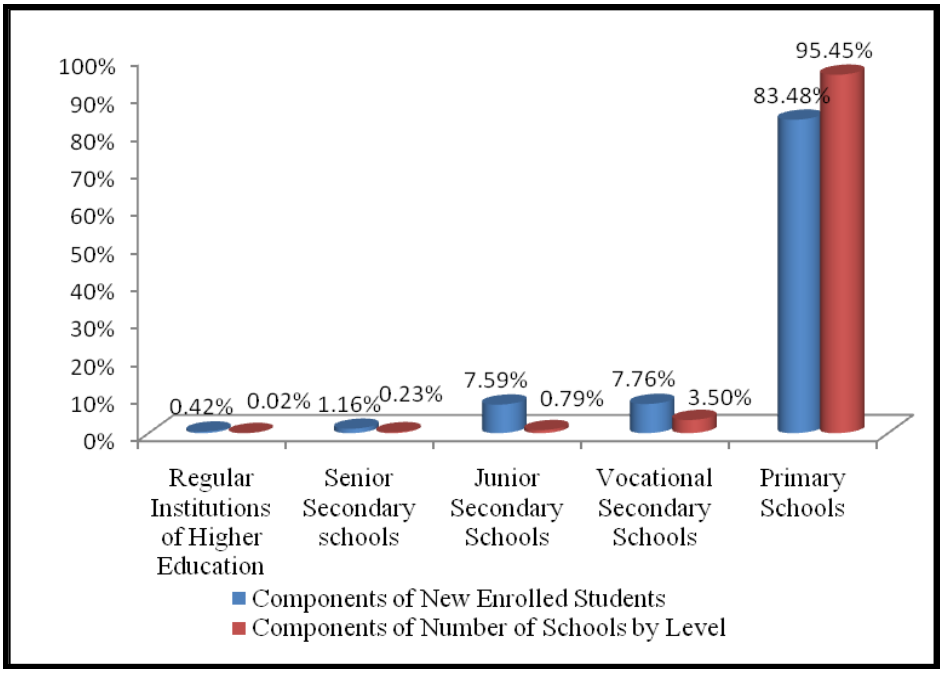
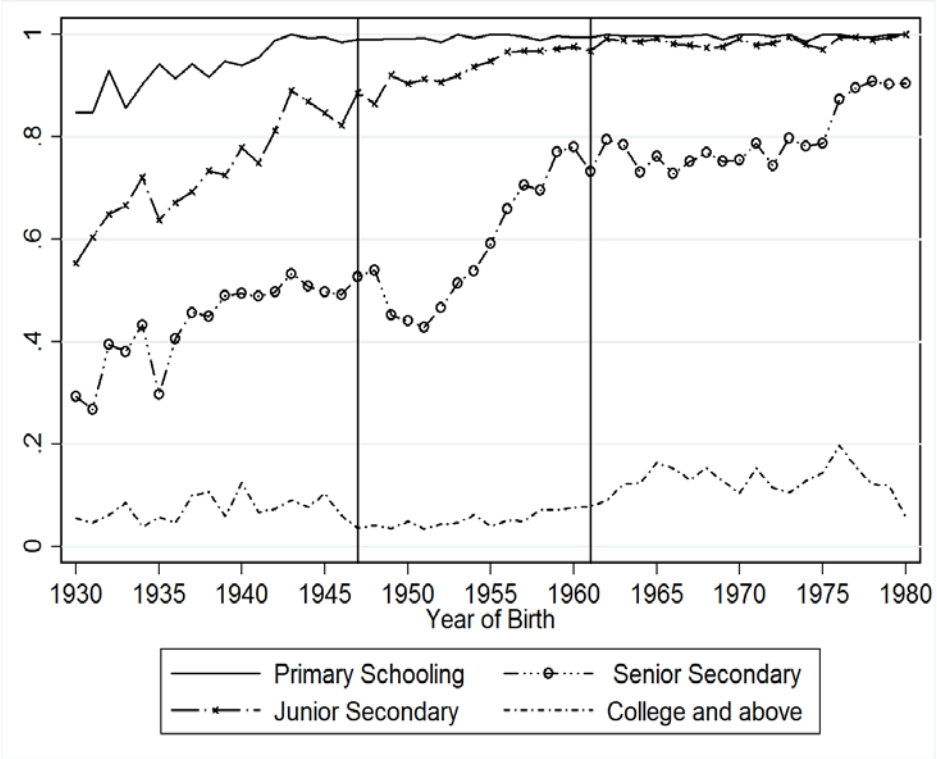


Figure A-3 shows the education condition in 1965. The red bar represent the number of schools and the blue bar represent the new students. The vertical axis is the ratio of the related information at the given education level to the whole nation. For example, the new enrolled students for junior secondary schools accounted for 7.59% of all the new enrolled students in 1965. The numbers of primary schools is 95.45% of all the schools of china in 1965.

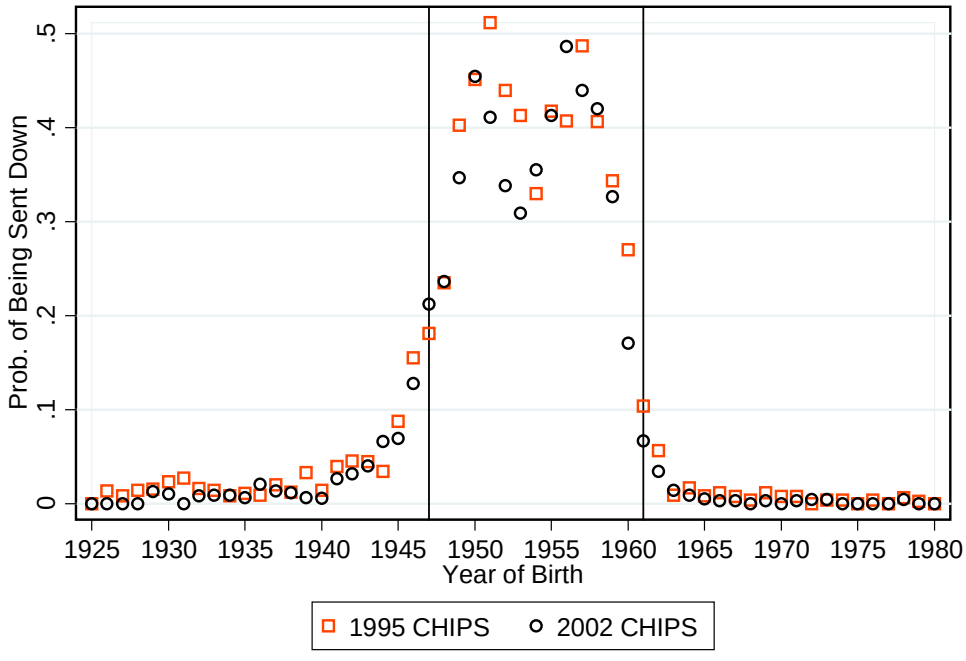
Figure A-4: Education Attainments in 2002, by Birth Cohort and School Level



B. The Send-Down Movement and Determinantes of Being Sent-down

B.1 Variation over Birth Cohorts and Regions

Figure B-1: The Prob. of Being Sent Down, by Birth Cohort.



Note: CHIPS, Urban Residents

Each scatter represents the proportion of the sample being rusticated at specific cohort

level in Figure B-1. The patterns over birth cohorts are consistent based on datasets of CHIPS 1995 and CHIPS 2002. The bumps indicates that the interested birth cohorts, 1946-1961, were more likely to be rusticated during the Cultural Revolution.

Figure B-2: The Length of Staying in the Rural, by cohort CHIPS 2002

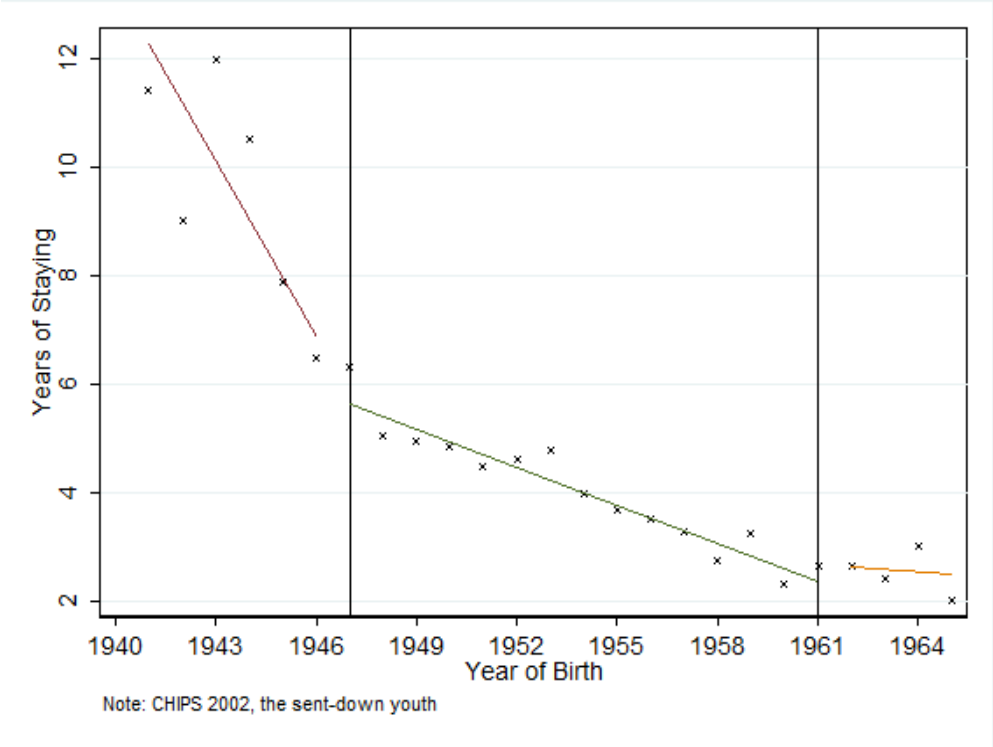


Figure B-3: The Probability of Being Sent-Down, by region CHIPS 2002

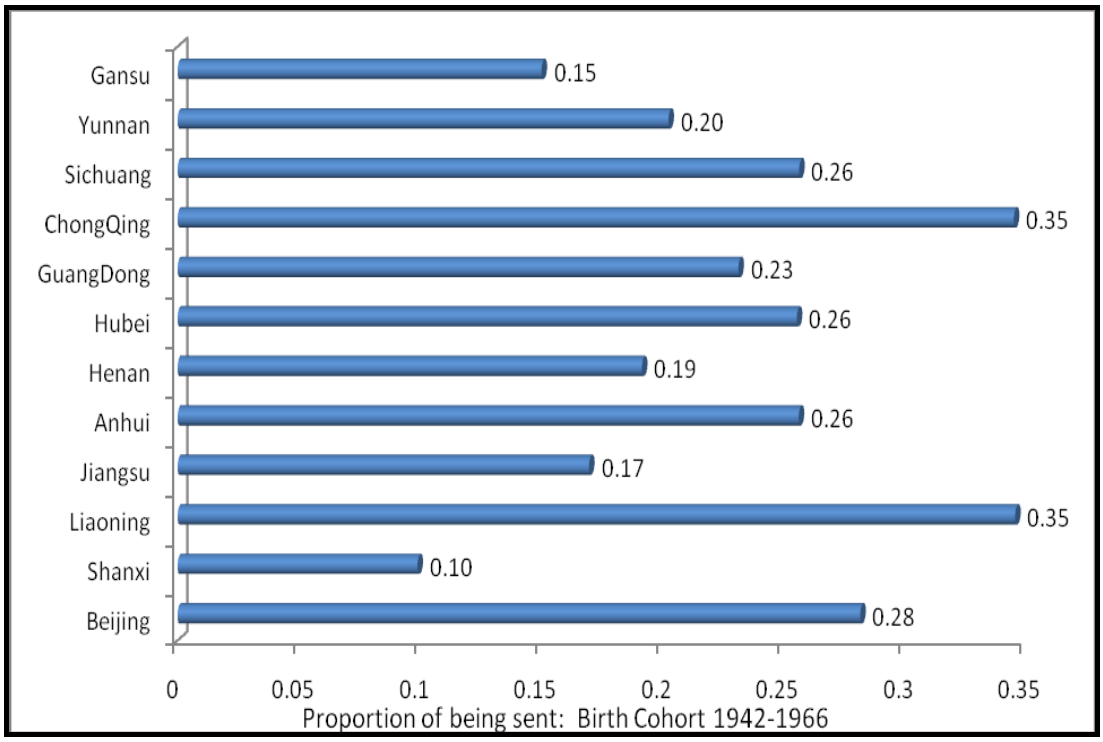
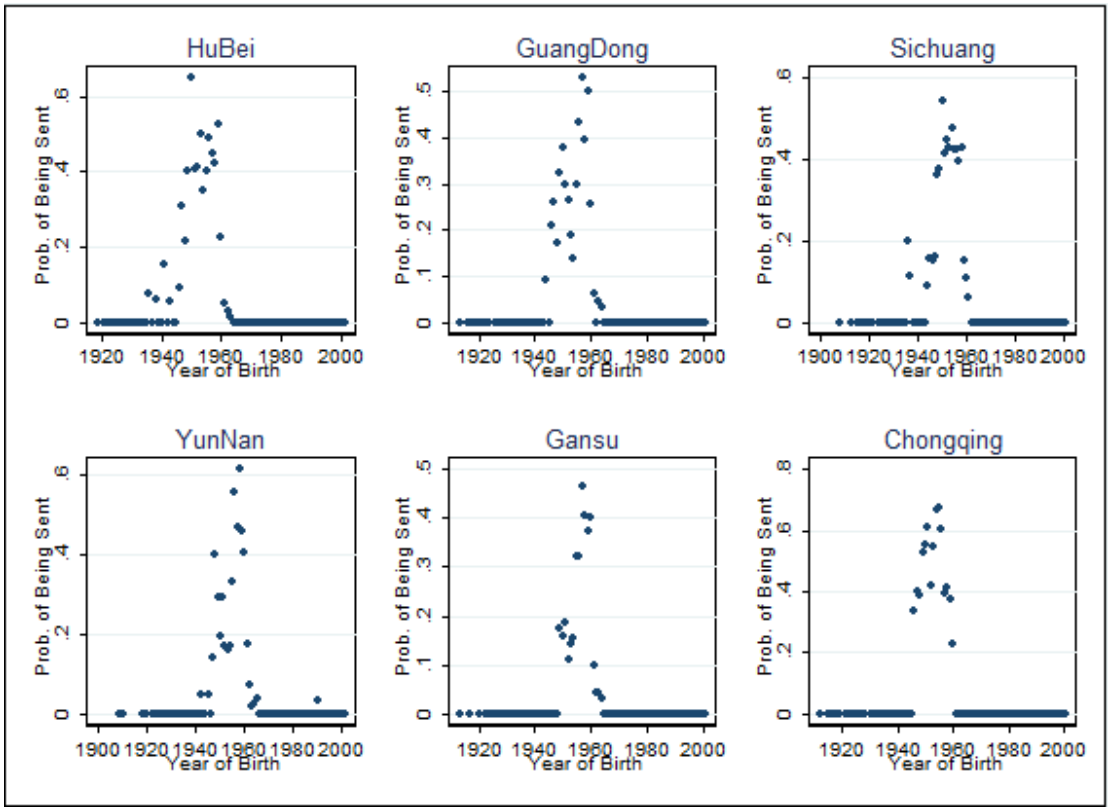


Figure B-4: The Probability of Being Sent-Down over regions and cohorts



B.2 Timing for Being Sent and Returning

Figure B_5: The Year of Being Sent to Rural Areas, by Birth Cohort

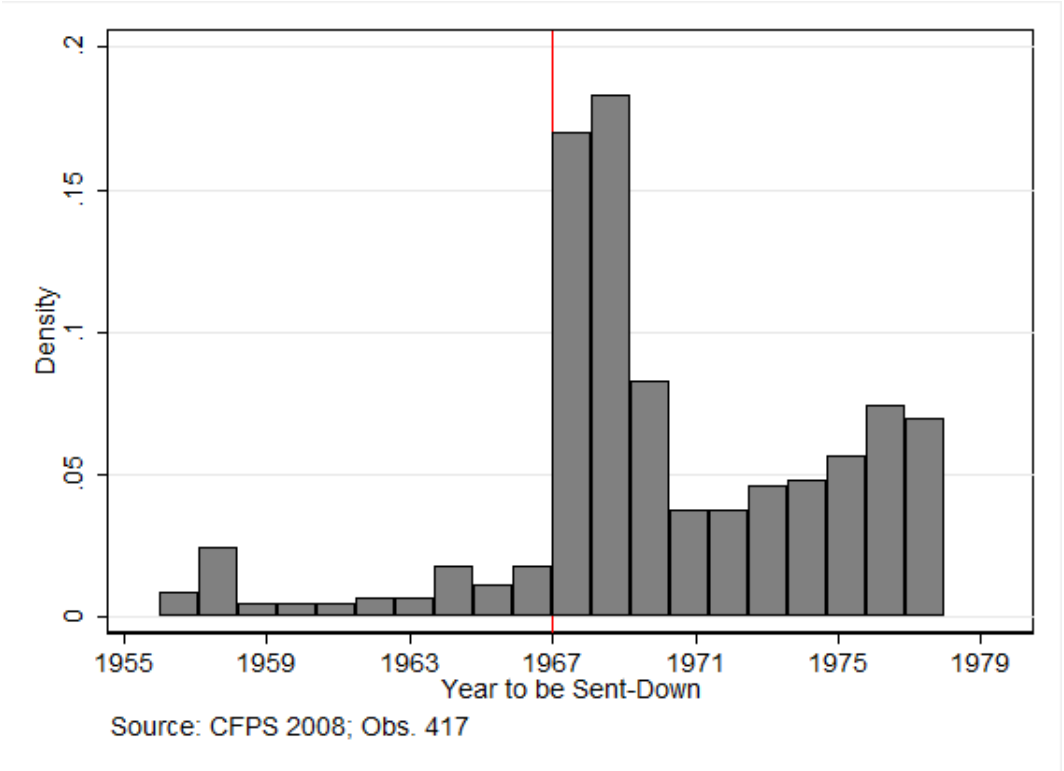
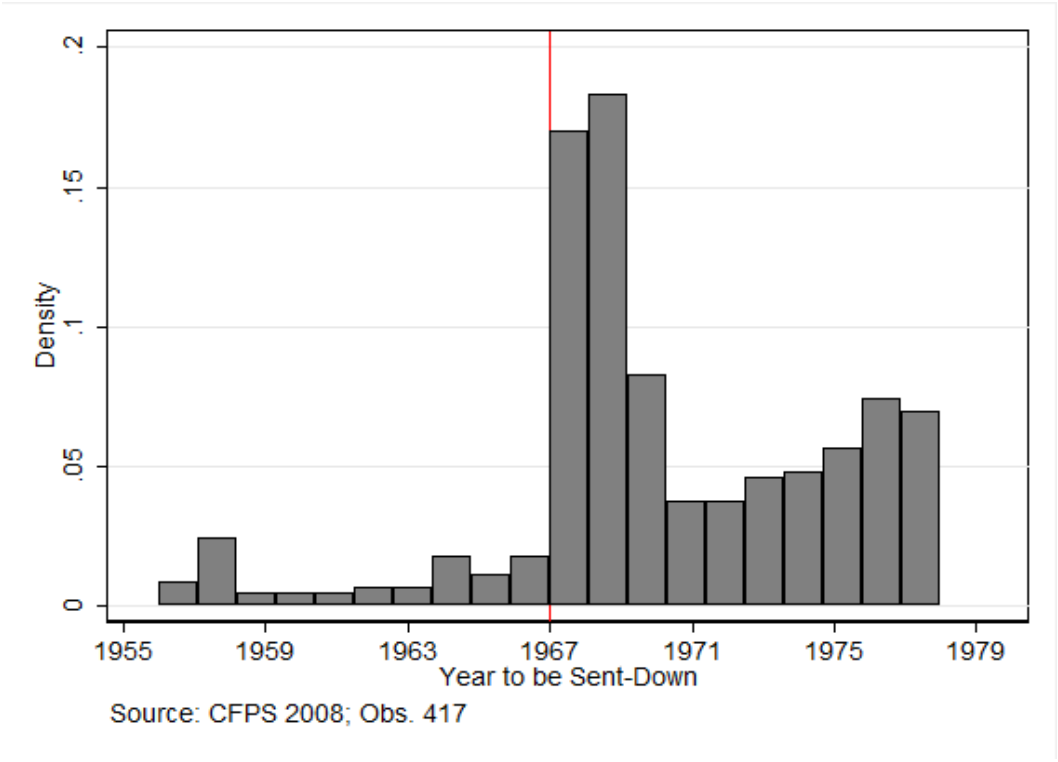


Figure B_6: The Year of Returning to Urban Areas



B.3 The Selection Problem

In Table B_1, I examine determinants of being sent-down for the interested cohorts 1946-1961. They were graduates or current students during the Cultural Revolution. The results show that predetermined factors, for example: parents' social status (Cheng fen) and parents' education attainments, play significant role in determining the probability of being sent-down for those children. Firstly, if parents were with higher education background, their kids were more likely to be sent-down. Secondly, if parents belong to some particular social status ("chengfen"), for example, rich peasants, office workers, petty proprietor and revolutionary cadre, their children were more likely to be sent-down to the rural areas. Thirdly, some regions have higher probabilities to send the youth to the rural areas. Additionally, I also explore their length of staying as the dependent variables. And their length of staying also to some extent significantly correlated with some characteristics of their family backgrounds. During the 1960s to 1980s, China was a planned economy and family income differences were trivial. Therefore without controlling family income will not bias our estimation. As discussed in the section 2, selection problem and heterogeneities among sent-down youth both cast doubts on the liability of the positive effects of the Send-Down Movement through simply comparing the sent-down and non-sent-down youth in the existing literature.

Table B_1 Determinants for Being Sent-Down

Dependent Variable	**Sent-Down**	
	Father's Education	**Mother's Education**
Base Group: Below Primary		
Primary	0.062***	-0.0081
	(0.02)	(0.021)
Junior high	0.057**	0.064*
	(0.025)	(0.033)
Senior high	-0.033	0.133***
	(0.037)	(0.042)
College and above	0.074*	0.167***
	(0.044)	(0.077)
Father's "Cheng Fen"	*Base Group: poor peasant or landless*	
Lower-middle peasant	-0.079*	
	(0.034)	
rich-middle peasant	0.083 *	
	(0.048)	
manual worker	0.131***	
	(0.043)	
office worker	0.139***	
	(0.051)	
petty proprietor	0.269***	
	(0.05)	
revolutionary cadre	0.163**	
	(0.065)	
Parents' Occupations	NO/Yes	
Mother's "Cheng Fen"	Yes	
R-Square	0.1	
Obs,	3287	

Note: 1. The sample includes the urban residents born between 1946 and 1961; 2. *** and ** represent significance at 1% and 5%, respectively; 3. The standard error is reported in the parenthesis. Only significant coefficients are reported in the table; 6. The dependent variable is a dummy represents whether one had been sent to the rural or not. Independent variables: father's age, mother's age, father's occupation, mother's occupation, father's social status, mother's social status and province fixed effect; 7. considerable models specifications have been applied. The conclusion is consistent. Results of regression are consistent with or without controlling parents' occupations.

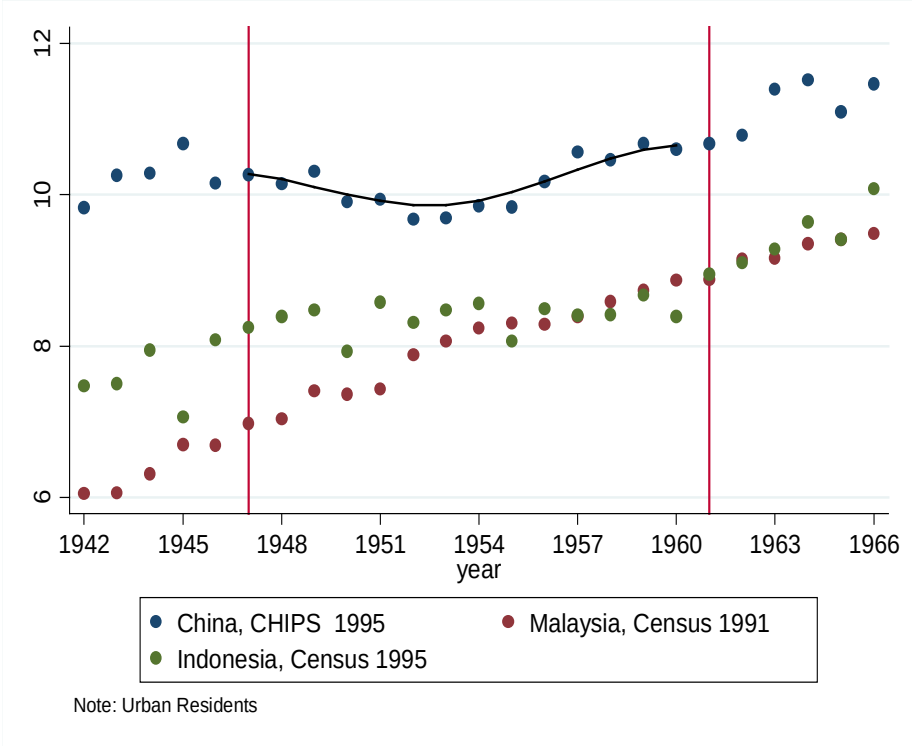
C. More Evidences on the Channels in the Mechanism

C.1 The Channel of Education Attainment

Comparison across Countries

Since the channel of education attainment is the most important channel, I further make placebo tests across asian countries to show the causal loss in human capital caused by the Cultural Revolution. In Figure C-1 the average schooling years obtained for different countries are graphed against different birth cohorts on the x-axis. The patterns of education attainment in Indonesia and Malaysia are without such obvious deep as China for birth cohorts from 1947 to 1961. The data resources and samples are urban residents from CHIPS (1995) for China, Census (1991) for Malaysia and Census (1995) for Indonesia.

Figure C-1: Average Schooling Year, by Country



I further make a comparison between different groups across countries. The two-two table above (Table C_1) illustrates a basic idea of difference in difference to identify the effect of Cultural Revolution on urban citizens' education attainment in China. Three groups of cohorts and three countries are explored . On general, China have higher education attainment than Indonesia across unaffected cohorts(left half of the table). In the lower half of the left part of table a control experiment is applied. Difference in diffence in the last row and the fifth collumn presents the difference of the economic performance between two countries without any disturbance. China were better developed compared with Indonesia (1.24 years of schooling more on average in China). Similarly, in the upper half, A comparison between China and Indonesia shows that the treated cohorts(1947-1961) obtained lower schooling years comparing with the before after cohorts in both countries. However, when look the difference in difference in the upper half of the left part of table F, There is a significant change of the sign of the differences in differences and it is shown that there exists a negative impact of Cultural Revolution(-0.42 years of schooling). At the right side of Table C_1, I construct comparisons between Indonesia and Malaysia. Those two countries for sure haven't been affected by Cultural Revolution. By contrary, in both experiments, urban residents in Indonesia obtained more education attainments . The difference in difference terms exhit the same sign keeping tracking the basic difference of economic development between the two

countries(-0.17 and -0.034). It gives us an idea of the lost in schooling caused by Cultural revolution for the affected cohorts and strengthens the validity of the main possible channel examined.

Table C_1: Comparison of Education Attainment by Country

Years of Schooling	Cohorts	Experiment of Interest China	Indonesia	Diff	Control Experiment Indonesia	Malaysia	Diff
Experiment Of Interest	1947-1961	10.16	8.41	1.75 (0.051)	8.41	8.15	0.26 (0.026)
	1942-1946 &1962-1966	11.06	8.9	2.16 (0.086)	8.9	8.47	0.43 (0.034)
Difference		-0.9 (0.046)	-0.49 (0.028)	-0.42** (0.075)	-0.49 (0.028)	-0.32 (0.029)	-0.17*** (0.041)
Control Experiment	1942-1946 &1962-1966	11.06	8.9	2.16 (0.086)	8.9	8.47	0.43 (0.034)
	1967-1972	11.31	10.39	0.92 (0.11)	10.39	9.93	0.46 (0.029)
Difference		-0.25 (0.108)	-1.49 (0.029)	1.24*** (0.11)	-1.49 (0.029)	-1.46 (0.031)	-0.034 (0.042)

Note: 1. the sample includes the urban residents born in three Asian countries; 2. ***, **, and * represent significance at 1%, 5%, and 10%, respectively; 3. the standard error is reported in the parenthesis.

Comparison across Regions

Compared with Table A-1 in the main context, we can see the rural residents' annual income has increased from 1990s to 2000s which is consistent with urban areas. But the average schooling years of treated group were not affected obviously by the Cultural Revolution. We can even see that the treated cohorts obtained more schooling years in 2002 Compared with the younger and older control cohorts.

Table C-2: Income and Education Attainment in Rural Areas

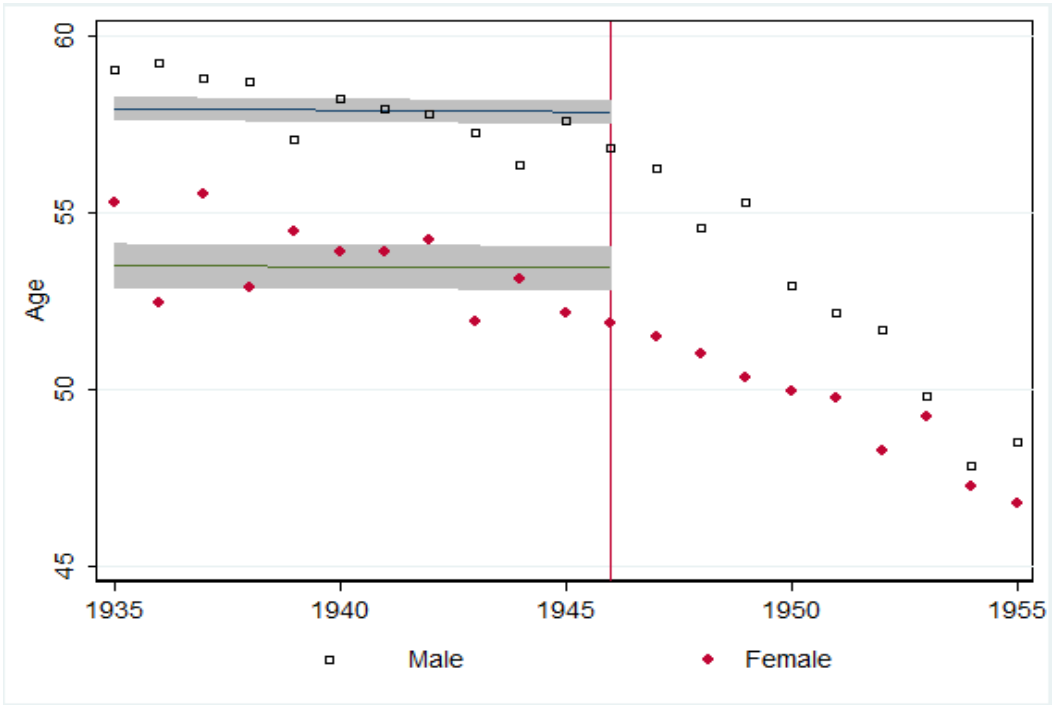
Outcome Variables	Mean	Older Group[a]	Birth Cohorts 1946-1961	Younger Group[b]
Permanent Rural Residents (obs. 3819/the wave of 1995; 7369/ the wave of 2002)				
Average Income (1995)	994.253 (4161.42)	730.651 (3243.73)	1036.981 (4473.56)	1082.03 (4079.10)
Average Income (2002)	1670.721 (3634.72)	1161.642 (3658.62)	1467.783 (3474.78)	1925.508 (3760.21)
Income Growth	68%	60%	41.5%	78%
Schooling Years (1995)	5.757 (3.16)	4.554 (3.19)	5.606 (3.17)	6.846 (2.77)
Schooling Years (2002)	6.846 (2.77)	5.74 (2.86)	7.536 (2.47)	6.78 (2.77)
Rural-urban Migrants (obs. 3407)				
Average Income (2002)	9766.91 (11905.14)	6522.632 (7338.86)	9958.875 (17812.39)	9769.68 (9903.76)
Schooling Years (2002)	7.665 (2.81)	6.615 (3.50)	6.652 (3.16)	7.958 (2.63)

[a] Older group includes birth cohorts of 1935-1945 for wave of CHIPS 1995 and birth cohorts of 1942-1945 for wave of CHIPS 2002 respectively.

[b] Younger group includes birth cohorts of 1962-1970 for wave of CHIPS 1995 and birth cohorts of 1962-1977 for wave of CHIPS 2002 respectively. Means of variables are shown with the standard deviation reported within the parentheses.

C.2 Channel of Working Experience and Employment Status

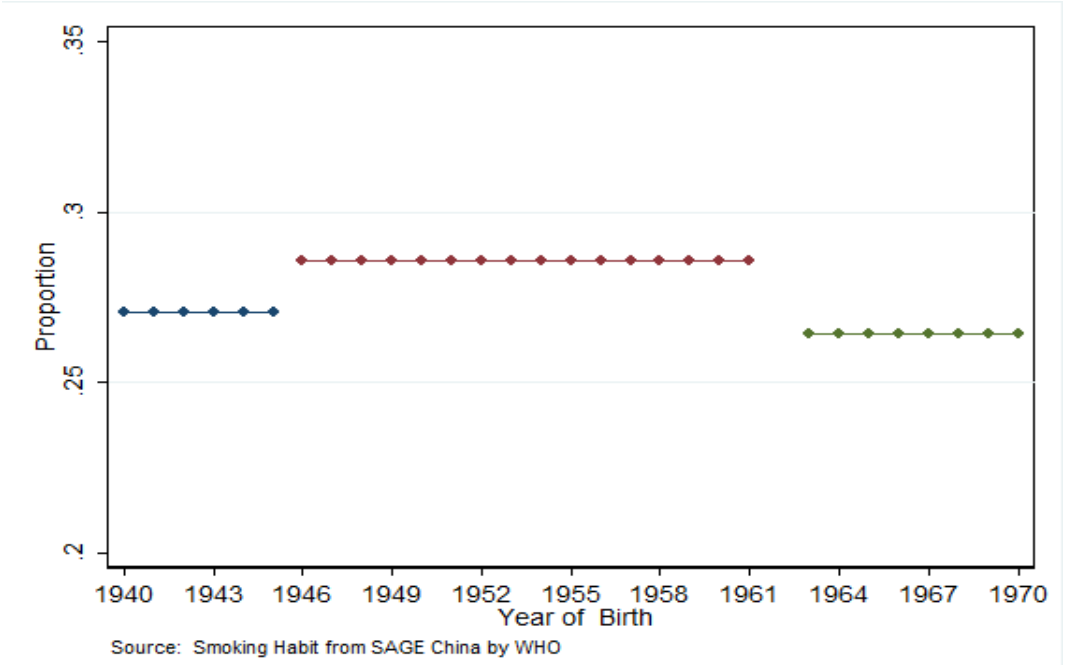
Figure C-2: The Age out of Labor Force, by Birth Cohort and Gender



Data resource is from world health organization(WHO) Study on Global Ageing and Adult Health (SAGE) survey 2007-2010.

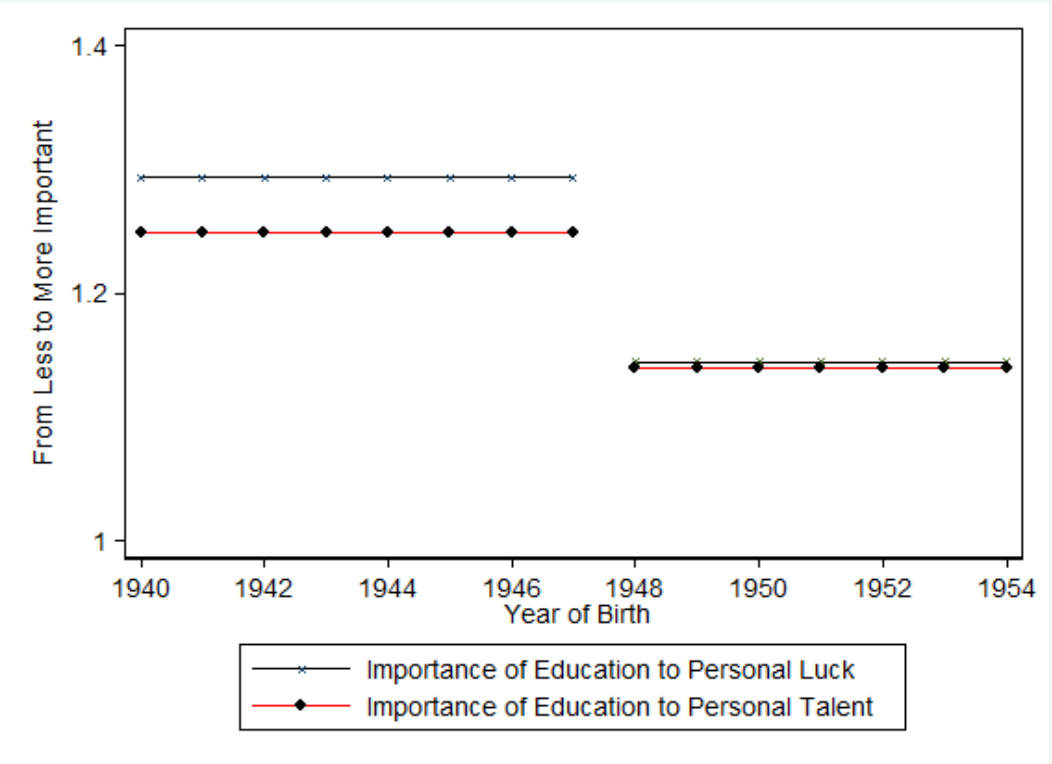
C.3 Health Habit

Figure C-2-1: The Proportion of Smokers, by Birth Cohort



Data resource is from world health organization(WHO) Study on Global Ageing and Adult Health (SAGE) survey 2007-2010.

Figure C-2-2: Attitudes for the Importance of Educational Factor in Personal Success, by Birth Cohort



Note: The vertical axis labels the relative importance of education to the other factors when observations reveal their attitudes for different determinants in personal success. It is graphed based on the numerical information from CPF studies in 2008.

D. More Robustness Checks

D.1 Placebo Tests for the Impacts on Income

In Table D_1, I examine the life cycle profile using census datasets of other countries. For example, large developing countries with rapid growth after 2000 (India and Canada) and stable developed countries (Canada and US). All the placebo tests show that there is no similar pattern found in our countries.

In Figure D-1, The scatters are the coefficients of the cohort indicators in the regression of income as well as schooling years on cohort indicators, gender and region indicators based the empirical sample. Two vertical lines highlight the interested generation. The right axis and hollow diamond scatter represents the information about education attainment. The left axis and the hollow circle scatter convey information for the regression of income. The results of urban China shows an unique deviation from the life cycle profile for the interested cohorts.

These results provide suggestive evidences that the impact of the Cultural Revolution on Chinese urban residents is not driven by inappropriate identification assumpations and not

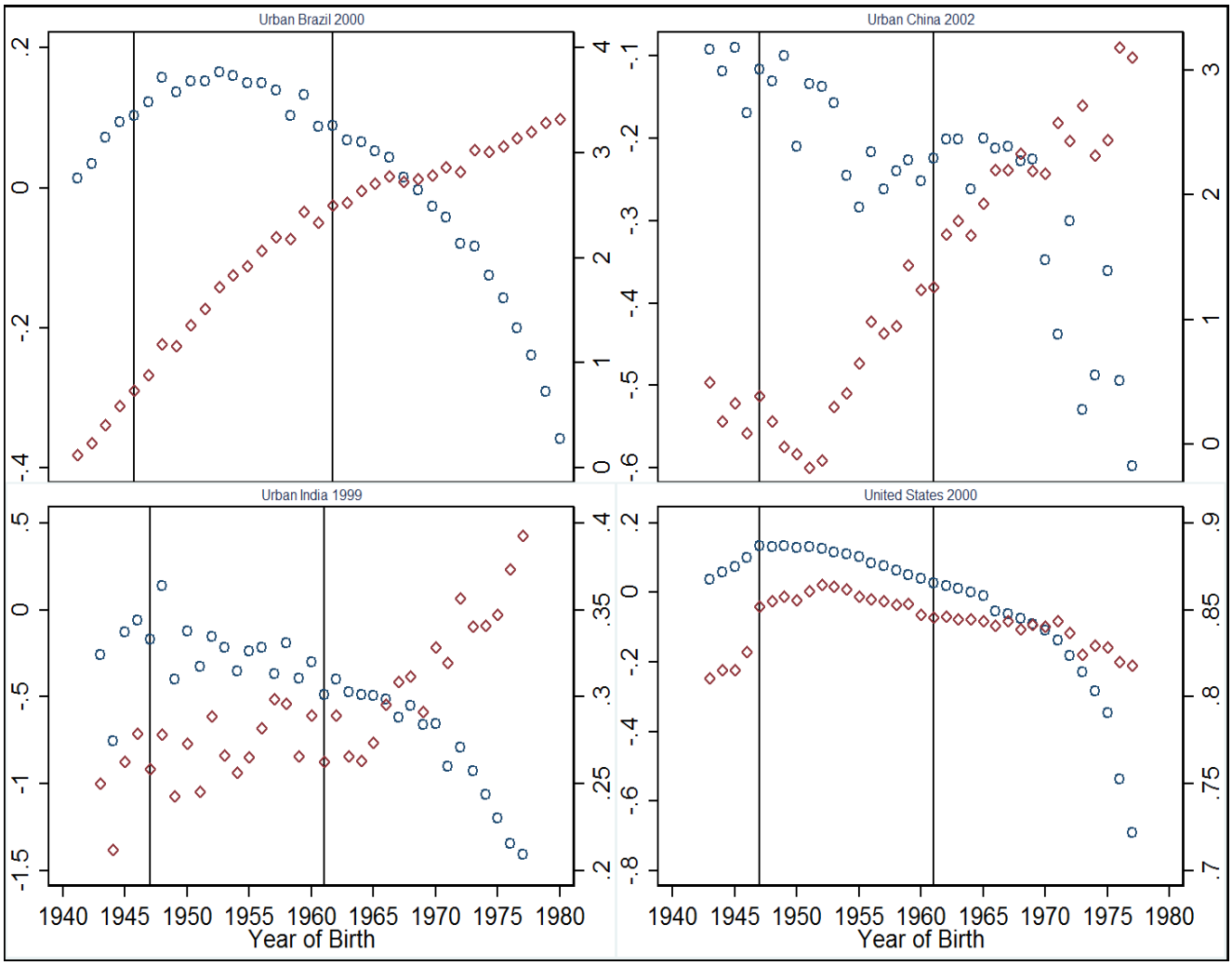
simply partial variations across different cohorts.

Table D_1 Placebo Tests across Countries

Variables	Placebo Tests across Countries (Census)					
	Brazil 2000	**India**	**India**	**US 2005**	**US 2000**	**Canada**
	Urban	Urban	Urban	Nation	Nation	Nation
CR	0.005	0.354***	-0.045	0.056***	0.058*	0.012
	(0.007)	(0.08)	(0.074)	(0.014)	(0.032)	(0.022)
Closure	0.004***	0.067***	-0.005	0.012***	0.017***	0.004
	(0.001)	(0.02)	(0.012)	(0.002)	(0.004)	(0.003)
R-squared	0.14	0.17	0.2	0.09	0.074	0.08
Obs.	2518052	84690	105441	1150173	6943678	347613

Data Sources: Census data from different countries.

Figure D-1: Coefficients of the Cohort Indicators in the Regressions of Income and Education Attainment



Note: blue scatters represents the coefficients of natural log of income regression while the red scatters represents the coefficients of education attainment regression.

D.2 Robustness Checks for Mechanism Using CHIPS 1995

Table D-2: Robustness of the Mechanism (CHIPS 1995)

Panel A:	**Birth Cohorts: 1942-1977**				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
CR	-0.186***	-0.131***	-0.102**	-0.071**	-0.072**
	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)
Schooling Years		0.041***	0.041***	0.041***	0.025***
		(0.002)	(0.002)	(0.002)	(0.002)
Working-Experience			0.02***	0.021***	0.018***
			(0.002)	(0.002)	(0.001)
Marital Status				0.133***	0.129***
				(0.04)	(0.04)
Occupation	No	No	No	No	Yes
R-squared	0.2	0.22	0.27	0.27	0.29
Obs.	11374	11192	11127	11127	11127
Panel B:	**Alternative Measures**				
Closure	-0.031***	-0.021***	-0.017***	-0.011**	-0.011**
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
Send-Down	-0.114***	-0.079***	-0.059**	-0.04***	-0.04***
	(0.011)	(0.02)	(0.01)	(0.01)	(0.01)
Panel C:	**Birth Cohorts: 1935-1970**				
CR	-0.107***	-0.047	-0.01	0.013	0.018
	(0.031)	(0.031)	(0.02)	(0.02)	(0.02)
Closure	0.012**	0.001	0.003	0.005	0.004
	（0.01）	(0.005）	(0.004）	(0.004）	(0.003）
Send-Down	-0.088***	-0.048***	-0.01	0.003	0.002
	（0.019）	（0.018）	（0.013）	(0.013）	(0.012）
R-squared	0.1	0.15	0.22	0.22	0.29
Obs.	12626	12625	12424	12424	12308

Note: 1. The sample includes permanent urban residents born between 1942 and 1977 and currently were employed in 1995; 2. *** and ** represent significance at 1% and 5%, respectively. The standard error is reported in the parenthesis and adjusted for 36 clusters in age; 3. Constructions of CR, Send-Down, Closure and Famine are the same as Table 3; Marital Status is a dummy variable and represents whether one is married with spouse in 1995. The missing income is replaced by 0; 4. Other independent variables: gender, age, age square, famine and province fixed effects; 5. For all the empirical models in this paper, I also examine the other construction for Send-Down (see section 2) considering the provincial heterogeneity and consistent estimates are obtained.