Does Adversity Affect Long-Term Consumption and Financial Behaviour? Evidence from China's Rustication Programme*

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Abstract

In this paper I examine the long-term consequences of adversity on consumption and financial behaviour, using the largest forced migration experiment in history. From 1966 to 1978, 17 million urban youths in China, mostly junior or senior high school graduates, were sent to the countryside to do farm work for an average of three to four years under a rustication policy. Using data from the mini-census in 2005, I find that the rusticated generation behaves more conservatively than the non-rusticated generations over the long term, as they consume less housing and purchase more insurance and pension. In addition to the cross-generational influence, I investigate the intra-generational effects of rustication with data from the Chinese Household Income Project and the Chinese Twins Survey in 2002. A similar conservative behavioural pattern is revealed. Individuals with rustication experience spend less on housing, accumulate more saving and insurance, and invest less in risky assets, compared to their age-eligible but non-rusticated peers. Applying a habit-forming model, I suggest that one interpretation for the conservative behaviour lies in the habits formed during adversity. The results shed light on how a policy, especially in the early stage of life, influences one generation over the long term.

Key words: adversity, long-term effects, housing consumption, financial behaviour.
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1 Introduction

Does adversity affect long-term consumption and financial behaviour? How does a policy influence one generation over the long term? I aim to address these two questions in this paper. Literature in economics, sociology, and psychology demonstrates evidence to support the correlation between early life experience and later economic behaviour. In the literature for the Great Depression, Malmendier & Nagel (2011) find that macroeconomic experiences influence individuals' risk taking behaviour. The generation which experienced the Great Depression tends to take fewer financial risks throughout their lives. They also have a markedly lower consumption of durable goods, as shown in Romer (1990) and Crafts & Fearon (2010). Schoar & Zuo (2013) examine the managerial styles of CEOs, and find that those entering the labour market during recession periods behave in a more conservative way.

Similar evidence is revealed among studies on the median- or long- term effects of military service or wars. Benmelech & Frydman (2014) study the behaviour of CEOs with military experience, and find that they are associated with conservative corporate policies and ethical behaviour. Blattman (2009) and Bellows & Miguel (2009) indicate that war violence changes individuals' political attitudes. They are more likely to join local political groups and vote after wars. With respect to other life adversities, Alesina & La Ferrara (2002) and Castillo & Carter (2007) present empirical evidence that people with traumatic experiences, such as disease or divorce, have less trust in others but show more altruism.

In this paper, I use a new quasi-natural experiment, China's rustication policy (programme), to investigate the long-term effects of adversity on economic behaviour. From 1966 to 1978, 17 million urban youths, mostly junior or senior high school graduates (born between 1946 and 1961), were sent to the countryside to do manual work for three to four years on average. With a shift from privileged urban status to an unprivileged rural one during adolescence, their behaviour on consumption and finance is expected to change. Previous studies have intensively investigated the long-term influence of rustication on education and income (Deng & Treiman, 1997; Giles *et al.*, 2008; Xie *et al.*, 2008; Yang & Li, 2011). Several papers investigate its impacts on mentality or

consumption, focusing on the dimension of home appliances and beliefs (Zhang *et al.*, 2007; Zhou, 2013; Gong *et al.*, 2014). Kinnan *et al.* (2015) link the rustication programme with the later reforms to the household registration system, and demonstrate that improved access to migration induces higher levels of consumption and lower volatility in rural China. Nevertheless, as a big change in identity during adolescence when one's belief toward the world is first established (Ghitza & Gelman, 2014), the influence of rustication on later economic behaviour is worth investigating. In this paper, I concentrate on examining its impacts on consumption and financial behaviour, as well as demonstrating auxiliary findings on labour input, education, income and belief, which echo the literature (Deng & Treiman, 1997; Xie *et al.*, 2008; Yang & Li, 2011; Gong *et al.*, 2014).

I apply difference-in-difference, ordinary least squares (OLS), and fixed-effects estimations to the mini-census in 2005, the Chinese Household Income Project in 2002, and the Chinese Twins Survey in 2002 respectively, to examine the cross- and intra- generational impacts of rustication. To start with, I apply difference-in-difference strategy to the mini-census in 2005 to depict the general behavioural pattern of the rusticated versus non-rusticated generations. Rustication varies across cohort and region. The generation of 1946-1961 were subject to the policy, with almost half of the population rusticated in practice. Cohorts born before 1946 or after 1961 were rarely sent to the countryside. In addition, rustication was more severe in large cities than small ones as the revolutionary propaganda was much stronger and coercion was enforced (Deng & Treiman, 1997). I find that the rusticated generation behaves more conservatively in consumption and finance than the non-rusticated cohorts. They live in smaller houses, spend less on housing purchase, and buy more insurance and pension even after three to four decades. These findings are consistent with the literature that individuals experiencing economic recession tend to spend less on durable goods (Romer, 1990; Crafts & Fearon, 2010), and have a lower willingness to take financial risk (Malmendier & Nagel, 2011; Schoar & Zuo, 2013; Benmelech & Frydman, 2014).

Rustication was announced as compulsory for all age-eligible high-school graduates at the start. However, the quotas of rustication varied according to economic situation and policy changes. When the quota was less than 100% (not all high-school graduates were required to be rusticated),

some selection occurred (Li *et al.*, 2010). There are two types of selection in the rustication. First, there exists cross-household selection, as the previously privileged families (such as the rich and/or educated) lost power in the social re-shuffle and were less able to help their children acquire exemptions from rustication (Zhou & Hou, 1999; Li *et al.*, 2010). Second, there is within-household selection. In the case of a binding quota, the parents had to choose which child(ren) to be rusticated. To overcome the potential endogeneity, I specify two empirical strategies. On the one hand, I explicitly control fathers' socioeconomic traits as proxies for the family background in the OLS estimation, with data from the 2002 Chinese Household Income Project in absence of the co-residency bias.[1] On the other hand, I apply twin and sibling fixed-effects estimations to the 2002 Chinese Twins Survey, which is the first dataset on twins in China. Bias from common family background is eliminated. In addition, the within-household selection is largely reduced in the specification for identical twins, as they are genetically the same, and have far less difference than non-identical twins or siblings that are further apart (Li *et al.*, 2010). Moreover, I specify a robustness check controlling the difference between identical twins using birth weight as a proxy for initial endowment following the literature (Rosenzweig & Wolpin, 1995; Behrman & Rosenzweig, 2004).

Just as with the difference-in-difference estimation, I find that individuals with rustication experience behave more conservatively than their age-eligible but non-rusticated peers. They spend less on housing consumption, save more, purchase more insurance, and invest less in risky assets such as stocks and bonds. Consistently across the three empirical strategies, I find that rustication decreases lifetime schooling, but does not have a significant influence on long-term income, as shown in previous studies (Meng & Gregory, 2002, 2007; Xie *et al.*, 2008; Yang & Li, 2011). The results remain robust if the potential influence from initial endowment, occupational choice, and spousal traits is taken into account.

Why do the rusticated individuals behave conservatively? With a simple habit-forming model, I consider one interpretation lies in the habits shaped during adversity (Becker & Murphy, 1988; Or-

[1]The 2002 Chinese Household Income Project collects socioeconomic information on parents, despite their living separately or being deceased. Thus it overcomes the co-residency bias in conventional household surveys.

phanides & Zervos, 1994; Crawford, 2010; Costa, 2013). Take housing for instance: given that the past and current consumption of habit-forming goods are complementary, the habit of depressed housing consumption formed during the rustication leads the later consumption to converge to a low steady state.[2] Empirical evidence examining the influence from the incidence versus the intensity of rustication supports the habit explanation. I find that it is mainly the rusticated years (the intensity) rather than the participation in the programme itself (the incidence) that contributes to the findings. The longer the rusticated period, the more likely is the convergence to a steady state of housing consumption. Interview evidence also supports this interpretation. The sent-down youths self-reported that they learned about the toughness of life from the adverse experience in rural areas (Zhou, 2013; Gong *et al.*, 2014). It is consistent as well with the evidence on the role of habits and values as determinants for behaviour and socioeconomic changes, such as the rise of the middle class during the Industrial Revolution and modern capitalism (Doepke & Zilibotti, 2008; Weber, 2013). What is worth mentioning is that the habit explanation does not exclude other possible interpretations. Various channels could co-exist, interact with each other, and influence long-term economic behaviour together.

Forced migration to rural areas happened in countries other than China, though none is comparable to its huge population and age concentration in adolescence. Indonesia had a Transmigration programme through the 20^{th} century, moving landless people from densely populated areas to less populous areas. The total population influenced was around five million (Fearnside, 1997). The Soviet campaign, *Dekulakization*, deported better-off peasants and their families to distant parts of the Soviet Union and other parts of the provinces between 1929 and 1932. More than 1.8 million rich peasants were deported during the peak time of 1930-1931 (Conquest, 1987; Viola, 2007). Russia's Virgin Lands Campaign between 1954 and 1963 was considered the predecessor for China's rustication programme. Advertised as a socialist adventure, 300,000 youths travelled to the Virgin Lands in the summer of 1954 (Taubman, 2004). Another parallel can be drawn with

[2]During the rustication, the sent-down youths lived in small shabby houses, called *"collective units"* that were shared with many others. Even by the end of 1976, about 1 million rusticated youths still had no proper dwellings to live in, especially for those who were married (Bonnin, 2013).

the U.S.'s Indian Removal in the 19^{th} century. About 70 thousand Indians were forcibly relocated to designated territories, because of population density concerns and the availability of arable land. Nonetheless, China's rustication programme affects a huge population of 17 million, and has a demographic concentration on adolescence when the attitude towards the world is first established (Ghitza & Gelman, 2014).

To the best of my knowledge, this is among the first to systematically investigate the long-term impacts of this biggest inner-country migration on economic behaviour. Previous studies focused on its impacts on education and income (Meng & Gregory, 2002, 2007; Xie *et al.*, 2008; Yang & Li, 2011). Literature investigates its influence on mentality or consumption, though focusing on the outcome of household appliances or beliefs (Zhang *et al.*, 2007; Zhou, 2013; Gong *et al.*, 2014). My finding is consistent with Gong *et al.* (2014) that the rusticated individuals are less likely to believe in luck, as they invest less in the risky assets and show more self reliance. Given that rustication shifts urban youths' privileged status into an unprivileged rural one during their adolescence when values are established, its impacts on behaviour are expected to be profound and worthy of investigation. In this study, I try to provide empirical evidence and explanation to locate the heterogeneity in economic behaviour. The study also sheds light on how a policy, pertaining to those in the early stage of life, exerts long-term impacts on a generation through changing their behaviour. The policy implication lies in the importance of later policy interventions if the policy makers take the long-term influence of one policy on economic behaviour into account.

The remainder of the paper is organised as follows. Section 2 specifies the theoretical framework. Section 3 provides institutional background on China's rustication programme. Section 4 describes three data sets followed by Section 5 which specifies corresponding empirical specifications. Section 6 presents and discusses empirical results. Section 7 draws conclusion.

2 Theoretical Framework

2.1 Set-Up

I adopt a habit-forming model to elaborate the long-term effects of rustication (Becker & Murphy, 1988; Abel, 1990; Orphanides & Zervos, 1994, 1995; Crawford, 2010). Suppose an individual has two consumption goods at period t: an ordinary good c_t with price 1, and a habit-forming good h_t (*eg.*, housing consumption) with price p. Her current utility, $u(c_t, h_t, s_t)$, depends on c_t, h_t, and a measure of stock of past consumption s_t, which depends on h_t but not c_t. The individual accumulates her future stock from previous consumption s_t and h_t. The evolution of stock is described below:

$$s_{t+1} = \delta s_t + h_t,$$

where δ is the depreciation rate of the past consumption stock. Through s_t and h_t, s_{t+1} enters the current utility $u(c_t, h_t, s_t)$. Her income y, is set constant following the literature (Becker & Murphy, 1988; Orphanides & Zervos, 1994, 1995). The maximisation problem is:

$$V(s_0) = max \sum_{t=0}^{\infty} \beta^t u(c_t, h_t, s_t) \tag{1}$$

$$s.t. \quad c_t + ph_t \leq y, \tag{2}$$

$$s_{t+1} = \delta s_t + h_t. \tag{3}$$

Following Orphanides & Zervos (1994), the utility function $u(c_t, h_t, s_t)$ follows the complementarity assumption that the current consumption h_t and the past consumption s_t are complements ($u_{hs} > 0$). In addition, this complementarity is stronger than that between c and $s(u_{hs} \geq u_{cs})$.[3]

Along an optimal path, the budget constraint (2) binds. By substituting $c_t = y - ph_t$ into the utility function, the objective function can be redefined as $x(h_t, s_t) \equiv u(y - ph_t, h_t, s_t)$, which is

[3]The other three assumptions of the utility function are: Assumption 1. the function $u(c, h, s)$ is second-order continuous for $c, h, s \geq 0$. Assumption 2. the function u is increasing and strongly concave in c and h. Assumption 3. $u_c(c, h, s) > 0$ for all $c, h, s \geq 0$ (Orphanides & Zervos, 1994).

a function of h_t and s_t only. Rewrite the maximization problem (1) in a dynamic programming framework:

$$V(s) = \max_{h}[x(h, s) + \beta V(\delta s + h)]. \tag{4}$$

The correspondence describing the optimal consumption path is: $\phi^*(s) \equiv \{s'|V(s) = x(s' - \delta s, s) + \beta V(s')\}$. $\bar{s}$ is a steady state if $\bar{s} \in \phi^*(\bar{s})$. Define s^c as a critical level if the optimal local dynamic diverges around it. Following Proposition 1 in Orphanides & Zervos (1994), the optimal paths are described as below:

Proposition: The optimal paths converge to a steady state monotonically from any initial stock; if the initial stock lies between two consecutive steady states, the optimal paths converge to either one or the other; exactly one critical level exists between any two consecutive stable steady states (Orphanides & Zervos, 1994).

2.2 Modelling the Impact of Rustication

I take the long-term impact of rustication on housing consumption as one instance to illustrate the incorporation of rustication into this model. Housing is habit-adjusted as discussed in the literature (Huang, 2012). Denote s_0 the initial individual stock of consumption at the start of rustication, and τ the duration of rustication. Define $h^*(s)$ the optimal unconstrained housing consumption, where s is the stock of past consumption. During the rustication, the housing consumption is depressed, as the sent-down youths lived in small shabby houses called *"collective units"*, which were shared with many others.[4] Thus I impose a cap on the housing consumption during the rustication, consistent with previous research (Costa, 2013). Set:

$$h_t = \bar{h} < h^*(s_0), \forall t \in [0, \tau]. \tag{5}$$

[4]Even by the end of 1976, about 1 million rusticated youth still did not lived in proper dwellings, especially for those married couples (Bonnin, 2013).

From the budget constraint (2), $c_t = \bar{c} = y - p\bar{h}, \forall t \in [0, \tau]$. Inserting $\bar{h}$ into eq.(3) and iterating, I obtain the stock of consumption at the end of rustication:

$$s_\tau(s_0) = \delta^\tau s_0 + \frac{1-\delta^\tau}{1-\delta}\bar{h}, \quad s_0 \ \ given. \tag{6}$$

If at the end of the rustication, the stock of consumption $s_\tau(s_0)$ is less than the critical level s^c, the housing consumption h_t will converge to a low steady state. Figure 1 illustrates the dynamics, with housing consumption on the vertical axis and the stock of consumption on the horizontal axis. The graphing follows Orphanides & Zervos (1995) and Costa (2013). Assume an individual is at the steady state $s_0 = s_h$ initially. During the rustication, she is forced to consume below $\bar{h}$, reducing her stock of consumption over the rustication period, τ. If by the end of the rustication, the stock of consumption $s_\tau(s_0)$ is less than a critical point s^c ($s^c < s_0$), she will enter a new optimal path converging to a new stable steady state with lower housing consumption. Alternatively, if the stock of consumption after the rustication does not drop below any critical value, the housing consumption will converge back to the original level. To summarise:

Prediction: After the rustication, if an individual's stock of housing consumption drops below a critical level, she will enter a new optimal path converging to a steady state with lower utilization of housing consumption.

From the conventional budget constraint with saving, an increase in the financial assets is expected from the decreasing consumption as demonstrated in the prediction above.

What is worth mentioning is that the habit channel could co-exist with other channels, such as the changing risk aversion or discount rate.[5] However, those mechanisms are not mutually exclusive. Moreover, they interact with each other, and shape the long-term economic behaviour together.[6]

[5]For instance, when the rusticated youths returned to cities, they were subject to fewer resources compared to their non-rusticated peers because of the lost years in the countryside. Poor economic status is associated with high risk aversion (Binswanger, 1981; Guiso & Paiella, 2008). To prepare for future rainy days, the rusticated youngsters are expected to consume less, save and insure more, and invest less in the risky assets. In addition, it is also plausible that the discount rate alters among the rusticated youths. They discount the future less and save more.

[6]For instance, the wealth effect after returning to cities could interact with the habit-forming channel, and aggravate the negative effect of rustication on housing consumption.

3 Institutional Background

From 1966 to 1978 during China's Cultural Revolution, approximately 17 million urban youths (1/10 of the urban population), most of whom were junior or senior high school graduates, were sent to the countryside (Li *et al.*, 2010; Gong *et al.*, 2014; Kinnan *et al.*, 2015). With no access to formal education, they spent 3-4 years on average in the rural area. They did heavy manual farm work for 12 hours per day and 7 days per week, as documented in Bernstein *et al.* (1977) and Zhou (2013). More than 90% returned to the cities by 1980, two years after the official end of the Cultural Revolution (Bonnin, 2013). About 5% never returned having married local peasants or found employment in non-agricultural jobs in rural areas (Zhou & Hou, 1999).

3.1 Origins and Rules of the Rustication

The earliest documented rustication was in 1955. It was small scale with less than 8,000 individuals affected (Bonnin, 2013). Large-scale rustication was initiated in 1966, with the start of the Cultural Revolution. In the first two years of the Cultural Revolution, primary schools, high schools, and universities were shut down. Many urban youths participated in the revolutionary activities. The rustication was made official in 1968, as Mao urged the urban youths to go to the rural areas to be re-educated by the farmers (Zhang *et al.*, 2007; Li *et al.*, 2010). Most were unwilling to be separated from families, and thus coercive techniques such as threatening parents with job loss were used (Deng & Treiman, 1997).

In addition to the revolutionary propaganda, rustication was motivated by deep economic concerns. The rising urban unemployment was an important cause for the large-scale rustication. Interrupted by the Cultural Revolution, senior high schools and universities closed and did not admit new students until 1971/1972. When they reopened, senior high schools did not recruit old students who missed the chance in previous years (Meng & Gregory, 2002). Universities did not admit senior high school graduates directly (Li *et al.*, 2010). The recruiting criterion was not academic merit, but performance in the Cultural Revolution (*e.g.,* participation in the rustication),

political attitude, or family background.[7] The dysfunction of senior high schools and universities in absorbing graduates served to increase youth unemployment. In addition, shortly after the foundation of the People's Republic of China in 1949, the baby boom enhanced the employment pressure among urban youths (Banerjee *et al.*, 2010; Zhou, 2013). The red line in Figure 2 circles the first baby boom shortly after 1949. Those children were of high-school age when the Cultural Revolution started, and would enter the labour market if there was no rustication.

The local government had yearly send-down quotas to meet. The quota varied according to the economic situation and policy changes. Figure 3 depicts the number of rusticated youths migrating into rural areas (Kojima, 1996). From 1967 to 1968, approximately 2 million people were sent to the rural areas. This number peaked at 2.67 million in 1969 (Kojima, 1996; Bonnin, 2013). With the economic recovery and increasing supply of urban jobs, the number of rusticated youths dropped in the following years. A second peak appeared around 1975 when the four leaders of the Revolution, called the *"Gang of Four"*, seized power and strongly advocated rustication using patriotic propaganda (Bai, 2014).

3.2 Variation Across Cohort and Region

The majority of the rusticated youths were junior or senior high school graduates. I focus on the cohorts born between 1946 and 1961 following the literature (Li *et al.*, 2010). The earliest birth cohort of 1946 contains the senior high school graduates in 1966 when large-scale rustication began.[8] The latest birth cohort of 1961 includes the junior high school graduates in 1978 when the rustication programme was officially ended. Figure 4 graphs the rustication rate in each cohort. It validates the specification on the treated generation between 1946 and 1961. For cohorts out of this range, the rustication rate is less than 10%.

The destination of rustication also varies, depending on the home cities and time of rustication. Bonnin (2013) documents that most rustication was within the province and students were sent

[7] Section 3.3 discusses the role of family background on rustication in detail.

[8] During that period, children were admitted into primary school around the age of 8. Primary-school education lasted for six years, followed by three years of junior- and senior- high school education, respectively (Li *et al.*, 2010).

to the nearby countryside. However, there was about 8% cross-province migration, mostly from big municipalities to the remote frontiers. Figure 5 demonstrates the direction of cross-province migration. It was concentrated in the three biggest municipalities (Beijing, Tianjin, and Shanghai), but also included other provincial capitals such as Wuhan and Chengdu. The destinations were the remote frontiers, such as Heilongjiang in the northeast, Xinjiang in the northwest, and Yunnan in the southwest. Because of the variation of rustication across cohort and region, I adopt a difference-in-difference estimation to capture the generation effect of rustication. Details are displayed in Section 5.1.

3.3 Potential Endogeneity

Rustication was announced as compulsory for almost all age-eligible high school graduates at the beginning. Nevertheless, when the sent-down quota was binding (not all high school graduates were requested to be rusticated), some selection occurred. There was cross- and within- household selection during the rustication (Zhou & Hou, 1999; Li *et al.*, 2010). On the one hand, the possibility of being sent to the countryside varied across households. This is because the previously privileged families (*eg.,* the rich and/or the educated) lost power in the social re-shuffling of the Cultural Revolution. Thus they are less able to help their children acquire exemptions from rustication. One the other hand, children from previously unprivileged families with parents who were workers, farmers, or soldiers during that time period, were more likely to be able to inherit their parents' jobs or join the army. Thus they were able to return to cities earlier, or even be exempted from rustication. In the 1970s, the rustication policy was relaxed. A small proportion of junior high school graduates, most with favoured family backgrounds, were directly admitted into senior high schools.

Figure 6 displays one instance of how the possibility of rustication varies with family background. The bar indicates the possibility of being rusticated. Numbers in brackets indicate observations in each category with percentages in the parentheses. A majority of the fathers have educational level at elementary school level (35.6%), followed by those who with no schooling

(29.3%), with junior high school level (18.3%), and with senior high school level or above (16.8%). Clearly, children from previously privileged family backgrounds, such as those with fathers who were intellectuals, had a higher probability of being sent to the countryside. This is because intellectuals were considered elites before the Cultural Revolution, and were against in the programme. A similar scenario applies to children of enterprise owners, as shown in Figure A.1. However, the magnitude of selection is small, with less than 5% conditional on fathers' educational level, or less than 10% on their social status.

In contrast, there is within-household selection in addition to the cross-household selection (Li *et al.*, 2010). Parents had to choose the child(ren) to go to the countryside if not all children were requested for rustication. Different empirical strategies are applied to address the cross- and within- household endogeneity, and will be described in Section 5.

4 Data

I use three data sets, each of which is associated with one empirical specification, to examine the long-term effects of rustication on housing consumption and financial behaviour. The three data sets supplement each other and are described as below.

4.1 Mini-Census 2005

I first use the 2005 mini-census to describe the behaviour of the rusticated generation versus non-rusticated generations. The generation experiencing rustication is expected to behave in a different way from their earlier or later counterparts, as almost half of them were rusticated, and the effect could spill over to other age-eligible but non-rusticated individuals. Figure 7 illustrates examples of the spill-over effects. For instance, the surge of population returning to cities after the programme may generate a demand shock on urban housing.[9] Importantly, the cross-generation investigation is not subject to the cross- or within- household selection as described in Section 3.3.

[9]The rustication programme was ended officially in 1978. In the following year, 3.95 million rusticated youths returned to cities (Kojima, 1996).

The mini-census was implemented from November 1 to November 10 in 2005 by the National Bureau of Statistics of China and the office of the 1% population sampling investigation in the State Council of the People's Republic of China. It covered 1% of the national population, or approximately 13,000,000 observations. The data I use covers 20% of the mini-census. My sample focuses on the urban areas, since the target of the large-scale rustication policy was urban educated youths. Rural residents and urban-to-rural migrants are excluded.[10]

The merits of using this data set are two-fold: first, the sample covers all provinces and is representative of the general population. My sample contains approximately 1 million observations with intact information on education and income. The sampling is according to the population in each province, autonomous region, and municipality, and thus representative of the general population. Second, unlike the population census, the mini-census asks detailed questions on housing size, purchasing price, insurance, and working time, in addition to education and income. It provides a rare opportunity to investigate the overall pattern of consumption and financial behaviour across China.

The summary statistics are presented in Column (1) of Table 1. Individuals are in their late 40s in 2005 and are sex balanced (52% are male). Almost half (45%) of the sample has at least a senior high school level of education in 2005, but only 5% achieves university level. The annual income is 1,630 U.S. dollars (USD) in 2002 values. The average housing size is 59 square metres, with an estimated market housing price of 7,645 USD in 2002 values. The average working hours are 46 hours per week, or approximately 9 hours per day.[11] Concerning insurance purchase, 30% of the population have unemployment insurance. The proportion of pension and health insurance almost doubles, possibly because of the average age being in the late 40s, when old-age support and medical care become increasingly important.

One possible caveat lies in no direct measurement on rustication being available in the mini-census. However, as I am interested in the cross-generational influence, this information is not

[10]Migrants from rural to urban areas still hold rural registration (*Hukou*), and do not have equal access to the same educational and occupational opportunities as urban citizens.

[11]The official working days per week in China are five after 1995.

necessarily needed. The following two datasets provide detailed rustication information at the individual level, which examines the intra-generational effects of rustication.

4.2 Chinese Household Income Project 2002

I apply the 2002 Chinese Household Income Project (CHIP 2002) to examine the intra-generational effect of rustication. CHIP 2002 is a joint research study sponsored by the Institute of Economics at the Chinese Academy of Sciences, the Asian Development Bank, the Ford Foundation, and the East Asian Institute at Columbia University. Consistent with the previous strategy, I focus on urban residents only. The data covers 54 cities or municipalities from 11 provinces in China, as marked in dark grey in Figure 8.

The advantages of using CHIP 2002 data to analyse the long-term impacts of rustication lie in the following features. First, the CHIP project provides rich data on rustication and outcome variables. The survey asks each individual above 35 years old about the experience of rustication and the length of time one was sent to the countryside. In addition, it records the individual's housing consumption (housing size and market price), saving, investment portfolio, expenditure on insurance, as well as working time, occupation, education and income. It provides a rare opportunity to investigate the consequences of rustication from various perspectives. Secondly, it collects information on family background in the absence of co-residency bias. The survey reports socioeconomic status on the parents of household heads and spouses, regardless of whether they live together or are alive. The information contains parental educational levels, social status classified before the Cultural Revolution, and political party affiliation. To the best of my knowledge, this is the only household survey in China that provides such detailed information on family background and overcomes co-residency bias. Last but not least, the area under this survey is geographically and economically representative, which provides an opportunity to yield nationally representative estimates.[12]

[12]CHIP is considered geographically representative as the areas under survey cover the northeast (Liaoning), the south (Guangdong), the southwest (Yunnan), and the west (Gansu). It is considered to be economically representative as the surveyed areas include the richest parts in China such as Beijing and Guangdong, as well as the least developed parts such as Gansu.

Column (2) in Table 1 presents the summary statistics. They are generally the same as those found in the mini-census, with no statistically significant differences reported. Among those age-eligible youths born between 1946 and 1961, 42% have been rusticated. Conditional on being rusticated, the average length of being sent to the countryside is 3.89 years (detailed tabulation of the rusticated years is shown in Table A.1). By the end of 2002, they have saved 4,342 USD, which is about three years' income.[13] In addition, they have invested 828 USD in stocks and bonds by the end of that year, which is almost half of their annual income. They also spend 195 USD on insurance, which is about 1/10 of annual income.

4.3 Chinese Twins Survey 2002

The third data set I apply is that of the Chinese Twins Survey in 2002, which is the first twins data set in China, designed by Professors Mark Rosenzweig and Junsen Zhang.[14] The survey was carried out by the National Bureau of Statistics in 2002 in five cities in China, depicted in yellow triangles in Figure 8.[15] It includes 1,838 identical twins, 1,152 non-identical twins, and 1,672 singletons (as control group) aged between 18 and 65. The survey collects information on each twin's housing consumption, working time, schooling, income, emotional control, and other demographic details, such as age, gender, and number of household members. Similar questions are also asked to their non-twin siblings and singletons in the control group.

My sample contains 602 identical twins and 4,866 siblings born between 1946 and 1961 with intact information on rustication, education, and income.[16] In addition to providing a rich set of outcome variables, I consider the following advantages of using the Twins Survey for this study. First, it contains detailed information on rustication, such as whether individuals were rusticated and for how many years. Second, it facilitates the elimination of bias from cross- and within-

[13] Saving is defined as the summation of fixed and current deposits, stocks and bonds, and others. Other sources contain money lent, self-owned funds for family business, investment in enterprises/business (except stocks and bonds), and monetary value of commercial insurance as a deposit.

[14] Professor Mark Rosenzweig is Frank Altschul professor of Economics at the Yale University. Professor Junsen Zhang is Wei Lun Professor of Economics at the Chinese University of Hong Kong.

[15] The five cities are Chengdu, Chongqing, Harbin, Hefei, and Wuhan.

[16] The sibling sample includes siblings of all twins and singletons.

household selection, as discussed in Section 3.3. This is because identical twins share similar genetics and have same family background. By adopting a twin fixed-effects strategy, I can eliminate influence from the unobserved family background. In addition, the differences between identical twins are much less than those between the non-identical twins and among further apart siblings. Thus the within-household bias on rustication is much reduced under this strategy. Similarly, siblings share the same family background although with various genetic traits. The sibling fixed-effects estimation supplements the results from the twin fixed-effects strategy.

Summary statistics on identical twins and siblings are displayed in Columns (3) and (4) of Table 1, respectively. They are roughly the same as those presented in the previous two data sets. No statistically significant differences are found for the variables. Specifically, for identical twins born between 1946 and 1961, more than half (54.2%) were rusticated. Almost 30% (180 twins from 90 pairs) of them have within-twin difference in rustication, which generates the variation in the twin fixed-effects estimation. The variation of rustication within identical twins is demonstrated in Table A.2.

5 Empirical Specification

5.1 Difference-in-Difference Estimation

Rustication varies across cohort and region, as discussed in Section 3.2. Therefore I apply difference-in-difference estimation to the mini-census in 2005 to investigate the generational effect of rustication. The outcome variables contain housing consumption, insurance and pension purchase, as well as working time, education, and income.

The treated generation includes individuals born between 1946 and 1961. The comparison group contains individuals born between 1940 and 1966 but not in the treated generation. I also specify a complementary strategy as comparing balanced rusticated cohorts of 1946-1950 and 1954-1958 *versus* non-rusticated cohorts of 1941-1945 and 1962-1966. They are the earliest (1946-1950) and latest (1954-1958) rusticated cohorts *versus* the non-rusticated cohorts ahead

(1941-1945) and afterwards (1962-1966). Specifically, the 1959-1961 birth cohort is excluded as individuals in that cohort were born during the Great Famine, and may otherwise contaminate the results.

In addition to birth cohort, rustication also varies across region. As documented in Bonnin (2013), the rustication was more severe in big cities, as the revolutionary propaganda was stronger and coercion was applied more heavily. To test this argument, I plot the city rustication rate against the logarithm of the city population using the census data in 1953, and present the result in Figure 9. A positive and statistically significant coefficient is revealed. With a 1% increase in the city population, the rustication rate is raised by 0.03 percentage points, and is statistically significant at the 5% level. As the average city rustication rate is 0.31 revealed from the Chinese Household Income Project 2002, the 1% rise in the city population indeed increases the city rustication rate by almost 10%. Consistent with the classification in the City Statistical Yearbook, I define cities with population above 1 million as big cities (NBS, 1985, 2002).[17]

The empirical specification is as follows:

$$y_{ict} = \alpha_1 big_c + \alpha_2 cohort_t + \alpha_3 big_c * cohort_t + X_{ict}\alpha_x + \mu_{ict} \tag{7}$$

where i stands for individual, c represents city, and t identifies time. *big* equals 1 if an individual lives in a big city. Otherwise, it equals 0. The dummy of *cohort* equals 1 if an individual was born between 1946 and 1961. It equals 0 if he/she was born between 1940 and 1966 but not in the treated generation. In the complementary specification, *cohort* equals 1 if an individual was born in 1946-1950 or 1954-1958 cohort. It equals 0 if in either the 1941-1945 or 1962-1966 cohort.

y_{ict} is the outcome variable. It includes housing consumption (housing size and price), pension and insurance purchase (unemployment and health insurance), as well as education (dummies of having education at senior high school/above or university/above), income (logarithm of income in the last month), and working time (working hours last week). X_{ict} is a vector of control variables,

[17]The cut-off points of city size are 2 million, 1 million, 0.5 million, and 0.2 million according to the City Statistical Yearbook. The range of the population in big cities in 1953 was from 1,091,600 to 6,204,417. The range for small cities was from 26,200 to 916,800.

which contain age, ethnicity, gender, and regional dummies. ϵ_{ict} is the disturbance term. Standard errors are clustered at the city level.

α_3 identifies the effect of rustication. One assumption for α_3 picking up the influence of rustication is that there is a parallel trend in outcome variables between big and small cities before the programme. Otherwise, the change may be because of events other than the rustication. Figures 10 - 12 check those trends. For instance, the senior high school rates in big cities (blue solid line) and small cities (red dashed line) are roughly parallel for cohorts prior to 1946 (Figure 10). With the start of the rustication, the senior high school rate remains stagnant in small cities but drops sharply in big cities. The deviation from the preceding parallel trend identifies the effect of rustication. Similar parallel trends are displayed in income (Figure 11) and housing consumption (Figure 12), which validate my method of difference-in-difference.

A similar specification as that in Eq. (7) is carried out, except the dummy of big_c is replaced with a continuous variable of city population in 1953:

$$y_{ict} = \beta_1 pop53_c + \beta_2 cohort_t + \beta_3 pop53_c * cohort_t + X_{ict}\beta_x + \xi_{ict} \tag{8}$$

where $pop53_c$ is the logarithm of city population in 1953. Others variables remain the same as in Eq. (7).

5.2 OLS Estimation Controlling Family Background Explicitly

With application to the Chinese Household Income Project in 2002 as described in Section 4.2, I specify OLS regression controlling family background explicitly as follows:

$$y_i = \gamma_1 rus_i + \gamma_2 family_i + X_i\gamma_x + \epsilon_i \tag{9}$$

The sample is restricted to individuals born between 1946 and 1961. Standard errors are clustered at the city level and y_i is the outcome variable. It includes housing consumption (housing size and price), and a set of measures on financial behaviour such as saving, share of investment out

of income on risky assets (stocks and bonds), and expenditure on insurance, which examines individual allocation of net consumption wealth. It also contains education (senior high school/above or university/above), income (logarithm of annual income), and working time (monthly working days and daily working hours).

rus_i is the interested independent variable. It is either a dummy for being rusticated, or the total rusticated years. $family_i$ is a vector indicating family background, which includes dummies for fathers' social status, educational level, and political status. X_i is a vector of control variables, including age, ethnicity, gender, and provincial dummies in all specifications. Additional controls vary slightly in different regressions. In the specification for housing consumption, I control education, income, and number of household members. In the specification for financial behaviour, education and income are additional controls. In the specification for income, I follow the literature (Mincer, 1974; Li *et al.*, 2010) by controlling for schooling, working years, and the squared form. Schooling is included as one additional control in the equation for working time.

5.3 Twin and Sibling Fixed-Effects Estimation

Regressions under twin fixed-effects follow conventional specification in the literature (Li *et al.*, 2007, 2010). Conditional on the data availability, my empirical work focuses on estimating the effects of rustication on housing consumption, working time, education and income, with data from the Chinese Twins Survey. The econometric specifications are as below:

$$y_{1j} = \lambda_1 rus_{1j} + Z_j\lambda_Z + X_{1j}\lambda_X + \mu_j + e_{1j} + \varepsilon_{1j} \tag{10}$$

$$y_{2j} = \lambda_1 rus_{2j} + Z_j\lambda_Z + X_{2j}\lambda_X + \mu_j + e_{2j} + \varepsilon_{2j} \tag{11}$$

where the subscript j indicates family. The subscripts 1 and 2 refer to twin orders. All identical twins born between 1946 and 1961 were age-eligible for the rustication. y_{ij} $(i = 1, 2)$ is the outcome variable, which includes housing consumption (housing size and property rights), working time (monthly working days and weekly working hours), education (dummies for having education at

senior high school/above or university/above), and income (logarithm of income in the last month). rus_{ij} $(i = 1, 2)$ is the interested independent variable. Similar to that in the OLS estimation, it indicates a dummy for being rusticated or the total rusticated years.

Z_j is a vector of observed family variables, such as regions, which are the same for identical twins. X_{ij} $(i = 1, 2)$ is a set of twin-specific control variables, which differ slightly in the regressions for different outcome variables. Specifically, in the specification for housing consumption, X_{ij} contains age, gender, schooling, number of household members and logarithm of monthly income. In the specification for working time, X_{ij} contains schooling years, in addition to the common controls of age and gender. In the regression for logarithm income, X_{ij} includes additional controls of schooling years, experience, and square form of experience, as under the OLS estimation. μ_j stands for unobserved family effect, such as parents' social, educational, or political status. e_{ij} $(i = 1, 2)$ indicates unobserved twin-specific endowment, such as ability, and ε_{ij} is the disturbance term. Standard errors are clustered at the household level.

Estimate of λ_1 under OLS estimation is biased because children from previously privileged families are more likely to be sent to the countryside, as discussed in Section 3.3. However, it is difficult to find proxies to identify unobserved family effect μ_j and twin-specific endowment e_{ij}, which are possibly correlated with rus_{ij}. To address the bias in OLS estimates, I apply fixed-effects estimation to identical twins. By taking difference between Eqs. (10) and (11), the fixed-effects estimator λ_1 below is obtained:

$$y_{1j} - y_{2j} = \lambda_1(rus_{1j} - rus_{2j}) + (X_{1j} - X_{2j})\lambda_X + \varepsilon_{1j} - \varepsilon_{2j} \tag{12}$$

The unobserved family effects μ_j are eliminated as twins share the same family background. Because identical twins are genetically the same, the influence from twin-specific endowment e_{ij} is reduced. One potential remaining concern is about within-twin selection. Parents may select one twin rather than the other to be sent down, depending on their unobserved endowment.[18]

[18]In the later stage of rustication, if a child was an only child or the only one staying at home, he/she could be exempted from the rustication (Liu *et al.*, 1995; Zhou & Hou, 1999).

Nonetheless, this difference is far less between identical twins than that between non-identical twins or spaced siblings (Li *et al.*, 2010). I also implement sensitivity analyses to control for the twins' birth weight as measure for initial endowment in Section 6.6.

In addition, I apply sibling fixed-effects estimation to siblings of all twins and singletons. The specification is as follow:

$$y_j = \lambda_1 rus_j + Z_j\lambda_Z + X_j\lambda_X + \mu_j + \varepsilon_j \tag{13}$$

where μ_j stands for the unobserved family-specific heterogeneity, which can be eliminated by the fixed-effects estimation. Other variables are defined the same as in Eqs. (10) and (11).

6 Empirical Results

Literature has intensively investigated the influence of rustication since the 1990s, although most focuses on education and income, or on household appliance in recent work (Zhou & Hou, 1999; Xie *et al.*, 2008; Li *et al.*, 2010; Yang & Li, 2011; Zhou, 2013). In this section, I present my new findings on the long-term consequence of rustication on consumption and financial behaviour. I also display the similar results on education and income as shown in the literature, and the auxiliary finding on working time.[19]

6.1 The Long-Term Effect of Rustication on Housing Consumption

Table 2 presents the long-term effect of rustication on housing consumption. Panel A displays the cross-generational effects of rustication from difference-in-difference strategy. Columns (1) and (3) demonstrate the estimates from Eq. (7), while Columns (2) and (4) show the corresponding estimates from Eq. (8). The first row presents results comparing generation 1946-1961 *versus* other cohorts born between 1940 and 1966. The second row displays the estimates for cohorts 1946-1950 and 1954-1958 *versus* 1941-1945 and 1962-1966. Panels B-D present the intra-generational effects

[19] Additional findings on self control and self reliance are shown in Table A.5 in the appendix.

of rustication. Specifically, Panel B presents the OLS estimates controlling family background explicitly. Panels C and D display the results from twin and sibling fixed-effects estimations, separately. The effects of being rusticated and the length of rustication are demonstrated in different rows.

I find that the rusticated generation spends significantly less on housing consumption even in the 2000s, compared to their non-rusticated counterparts as shown in Panel A. Rustication has negative and statistically significant impacts on both housing size and purchase price, consistently across various specifications. As expected, the magnitudes of estimates in Columns (1) and (3) are consistently larger than those in Columns (2) and (4), as the former aggregates the effect from all big cities.

Controlling family background explicitly, the OLS estimates in Panel B reveal a similar pattern. The sent-down youths live in smaller dwellings by 1.8 square metres on average, compared to non-rusticated individuals with education and income controlled (Column (1) of Panel B). It is statistically significant at the 10% level of significance. One additional year of rustication reduces housing size by 0.5 square metres with statistical significance at the high 1% level (Column (2) in Panel B). With respect to the housing price, sent-down individuals spend 796 USD less than their non-rusticated counterparts. One more year of rustication is associated with 187 USD less in housing expenditure. The two estimates are at the 5% and 1% levels of statistical significance respectively. The magnitudes are similar to or within reasonable variation compared to those of estimates presented in Panels A.

Similar results are revealed under twin and sibling fixed-effects strategies. With one more year of rustication, the housing size decreases by 0.8 and 0.5 square metres among identical twins (Column (2) of Panel C) and siblings (Column (2) of Panel D) separately. The magnitude is similar to the one found under OLS specification. The two estimates are statistically significant at conventional levels. The rate of private home ownership drops as well, although with no statistical significance.

The negative impact of rustication on housing consumption is consistent with studies on the in-

fluence of the Great Depression. Romer (1990) and Crafts & Fearon (2010) find that the generation experiencing the economic crisis has a markedly lower consumption of durable goods. Similar to the economic recession, rustication induces individuals to forgo the pursuit of the largest household durable goods of housing.

6.2 The Long-Term Effect of Rustication on Saving and Investment

Table 3 presents the OLS estimates on the long-run influence of rustication on saving and investment, controlling family background explicitly. Columns (1) and (2) present the effects of rustication on the logarithm of household savings, which contains fixed and current deposits, stocks and bonds, and the monetary value of commercial insurance as a deposit. The last two columns display the corresponding results on the ratio of stocks and bonds relative to annual income. It aims to estimate the influence of rustication on the behaviour of investing in risky assets.

I find that rustication increases saving and decreases the investment in risky assets. Specifically, the rusticated youths accumulate 6.5% more saving compared with their non-rusticated counterparts, with statistical significance at the 10% level (Column (1)). In addition, with one more year of rustication, the ratio of stocks and bonds relative to the total income declines by approximately 0.03 percentage points (Column (4)). The estimate is statistically significant at the 10% level. Considering stocks only, the share of stocks out of income is decreased by 0.025 percentage points (Column (6)) with one more year of rustication. The estimate is with statistical significance at the 10% level.

This financial behaviour is consistent with that of the depression babies (Malmendier & Nagel, 2011). The generation which experiences low stock/bond returns is less likely to participate in the stock/bond market throughout their life. Even if they participate, they invest a lower proportion of their income in such risky assets. Schoar & Zuo (2013) show that CEOs who enter the labour market during recession periods accumulate more long-term assets but have less asset turnover. Evidence on rustication agrees with the literature in the sense that the rusticated individuals accumulate more saving. However, contrast to the effect of the Great Depression, no stocks or bonds

existed during the rustication period. Nonetheless, the rustication still changes their investment behaviour. This finding echoes Gong *et al.* (2014) that the rusticated individuals believe less in luck, and thus they spend less in risky assets.

6.3 The Long-Term Effect of Rustication on Insurance and Pension

Table 4 presents the long-term impacts of rustication on insurance and pension purchase. Panel A presents the difference-in-difference estimates from the 2005 mini-census. The outcome variables are dummies if an individual purchases unemployment or health insurance, or a pension. Panel B displays the OLS estimates of the effect of rustication on annual insurance expenditure from CHIP 2002.

I find that the sent-down generation purchases more insurance than the non-rusticated generations as shown under the difference-in-difference strategy in Panel A. Rustication increases the possibility of purchasing a pension by 0.9%-4.1% (Columns (2) and (5) in Panel A). The probability of buying health insurance is also increased by 1.2%-5% (Columns (3) and (6) in Panel A). All the coefficients are statistically significant at a high 1% level of significance.

Similar evidence is found under the OLS strategy controlling family background explicitly. The sent-down experience increases annual insurance expenditure by 51 USD (Column (1) in Panel B). This estimate is statistically significant at the 10% level of significance. Given the average insurance expenditure is 195 USD (Column (2) in Table 1), rustication raises the insurance purchase by almost 25%.

This finding is consistent with the literature that individuals born during the Great Depression are less willing to take financial risks in later life (Malmendier & Nagel, 2011). It is also in accord with the mass media report that Millennials experiencing the economic recession in late-2000s behave in a more risk-averse manner (Groth & Giang, 2012). As shown in the literature, more risk aversion is associated with more insurance purchases (Cicchetti & Dubin, 1994; Rabin & Thaler, 2001). Although no insurance or pension existed during the rustication, the adverse experience still influences the treated population in that they purchase more health insurance and pension in the

long run. Nevertheless, rustication does not have a statistically significant impact on the purchase of unemployment insurance. A possible explanation is that the rusticated youths were at the late stage of their working life cycle (44-59 years old) in 2005. The risk of unemployment is low and replaced by the approaching retirement.

6.4 Auxiliary Findings: The Long-Term Effect of Rustication on Education, Income, and Working Time

The Long-Term Effect of Rustication on Education and Income The effects of rustication on education and income are first-order results and are studied intensively (Deng & Treiman, 1997; Zhang *et al.*, 2007; Giles *et al.*, 2008; Xie *et al.*, 2008; Yang & Li, 2011). In this section I display similar findings in Tables 5 and 6 to those in the literature. The table structure is the same as that of Table 2.

Lifetime education is decreased, as shown graphically in Figure 10 and empirically in Table 5. The rusticated generation has lower educational stock than the earlier or later generations, as shown in Panel A of Table 5. The finding is robust under various specifications of the difference-in-difference estimation. The intra-generational effect of rustication, as shown in Panels B-D, is consistent with the cross-generational evidence. Controlling for family background explicitly, one more rustication year reduces senior high school and university rates by 0.9% and 0.3% respectively, at a high 1% level of significance (Columns (2) and (4) in Panel B). Similar results are repeated under fixed-effects estimation. Compared to non-rusticated twins, the rusticated twins are 4.4% less likely to reach university level (Column (3) in Panel C). This coefficient is statistically significant at the 10% level of significance.

Although rustication reduces lifetime schooling, it has no statistically significant impact on income across various empirical specifications as shown in Table 6. The literature demonstrates similar results (Zhang *et al.*, 2007; Xie *et al.*, 2008; Yang & Li, 2011). Zhang *et al.* (2007) suggest that the insignificant change in income can be ascribed to the improved interpersonal skills and resilience generated by hardship. Detailed discussion is provided in Section 6.5.

The Long-Term Effect of Rustication on Working Time A consumer's utility is formed through consumption and leisure, as described in conventional microeconomic settings (MaCurdy, 1981; Seckin, 2001; Arrow & Dasgupta, 2009). Thus in addition to investigating the effect of rustication on housing consumption, I examine its impact on working time, which is a complement for leisure given the total time fixed. Table 7 reports the estimates under the four empirical specifications.

I find that there is no statistically significant cross-generational effect of rustication, as presented in Panel A of Table 7. In other words, the working pattern does not differ significantly between rusticated and non-rusticated generations. One explanation is the squeezing effect. As the rusticated youths work longer, they squeeze the working time for their peers. Therefore on average, the rustication does not have statistically significant influence on working time for the overall treated generation.

In comparison to the insignificant cross-generational effect of rustication, the intra-generational effect of rustication on working time is positive and statistically significant as presented in Panels B-D. Specifically, rusticated youths spend around five more hours per week working (Columns (3) in Panels C and D), compared to non-rusticated individuals. The two estimates are statistically significant at 1% or 5% levels respectively. Similar results are revealed for the impact from the total length of rustication. With one additional year of being sent down, working time is raised by 0.2-0.3 days per month (Columns (2) in Panels C and D), and 1.7-1.9 hours per week (Columns (4) in Panels C-D), with statistical significance at conventional levels.[20]

These findings are consistent with mass media reports on the changing work ethic of generation Y who experienced the late-2000s recession.[21] They are "twice as keen to work" (Keogh, 2012), and "work incredibly hard" to protect their jobs (Groth & Giang, 2012), as they start to consider a good job as a "privilege" rather than a "given" (Levit, 2010). However, to the best of my knowledge, all of these claims are from employers' reports or interviews. No empirical studies have

[20]The measurement on working time from the Chinese Household Income Project (Panel B) is considered less precise than that from the Twins Survey (Panels C and D). In the former survey, average working time in the previous year is collected rather than that in the previous week as in the Twins Survey. Thus it introduces more memory errors.

[21]Generation Y, also known as Millennials, refers to those born between the early 1980s and early 2000s, who are the descendants of the Generation X.

been done in this area. This research attempts to provide evidence from survey data to examine the impact of adverse experience on work ethic.

6.5 Incidence *Versus* Intensity of Rustication

Does the incidence or the intensity of rustication shape long-term economic behaviour? In this section, I examine the effects of being rusticated and the length of rustication simultaneously, under a twin fixed-effects estimation. Supporting evidence for the habit channel is revealed in Table 8.

With the rustication dummy (the incidence) and the total years (the intensity) entering the equations simultaneously, I discover that it is the intensity, rather than the incidence of rustication, that drives the behaviour pattern. Specifically, with one more year of rustication, housing size is reduced by 0.63 square metres, with statistical significance at the 10% level (Column (1)). One additional rusticated year is also associated with 1.8 more hours of work per week, as demonstrated in Column (2). The estimate is statistically significant at the 5% level. The incidence of rustication, however, is not statistically significant in either of the specifications.

Consistent with previous findings, neither the incidence nor the intensity of rustication affects long-term income, as shown in Column (3). In addition, neither of them has a statistically significant influence on education (Columns (4) and (5)), possibly because of the dispersed effects when putting the rustication dummy and length of time simultaneously into the regression.

The finding that the intensity rather than the incidence of rustication drives the results supports the explanation of habit formation. It is because the longer the rusticated years, the more stable the habit is. In this scenario, an individual is more likely to converge to the steady state in the long term.

6.6 Robustness Checks

Tables A.3 - A.4 show the robustness checks. To address the potential endogeneity from cross- and within- household selection, I use a twin fixed-effects strategy with an application to identical

twins.

The first concern is that individuals' initial endowment may be correlated with their exposure to rustication and the later outcome simultaneously. In such a case, the estimates are contaminated. Although identical twins, for instance, are genetically similar to each other, their slight difference may still bias parental choice in making the rustication decision as discussed in Section 3.3. Following the literature, I choose weight at birth as one measure for initial endowment, and include it as an additional control in Eq. (12) (Rosenzweig & Wolpin, 1995; Behrman & Rosenzweig, 2004). Results are presented in Panel A of Table A.3. A similar pattern as that in the baseline results is revealed. The magnitudes and levels of significance of the robustness estimates are similar or within reasonable variation.

The second concern is that rustication may alter individuals' occupational choice and thus affect their long-term working behaviour. Taking the endogenous occupational choice into account, I control explicitly for the working sector and occupational type in the main regressions. Results are displayed in Panel B of Table A.3. Similar to the findings in the baseline results, the rusticated individuals decrease their housing consumption but work for longer hours. Moreover, I test directly the effects of rustication on participating in the state-owned sector, being a white-collar worker, or the possibility of self-employment. Results are presented in Table A.4. No statistically significant influence is revealed from rustication on the sectoral or occupational choice.

Third, as housing consumption and time allocation are jointly decided between married couples, the traits of the spouse may also affect the results. To address this concern, I include the schooling and working sector of the spouses of twins into the estimation. Again, the baseline results remain robust after controlling for spousal information, as shown in Panel C of Table A.3.

Last but not least, the cohort effect is also likely to influence the long-term outcome. As shown in Figure 3, the intensity of rustication varies across years. Individuals sent to the rural areas during peak time may be affected more by the rustication over the long term, than their counterparts rusticated during the mild period. Thus I include the initial year of rustication into

Eq. (12).[22] Results are presented in Panel D of Table A.3. Again, the baseline outcome keeps robust after this sensitivity test.

7 Conclusion

In this paper, I investigate the long-term consequence of adverse experience on economic behaviour. Using the largest forced migration experiment of China's rustication programme between 1966 and 1978, I estimate its influence on housing consumption and financial behaviour in the 2000s.

By applying a difference-in-difference estimation to the mini-census in 2005, I first examine the cross-generational effect of the rustication. I find that the rusticated generation behave more conservatively than the non-rusticated cohorts. They live in smaller houses, spend less on housing purchases, and buy more insurance and pension in the long term. Second, I investigate the intra-generational impact of rustication, applying OLS and fixed-effects estimations to the Chinese Household Income Project and the Chinese Twins Survey in 2002 respectively. A similar behavioural pattern was demonstrated. The rusticated individuals behave more conservatively than their non-rusticated counterparts. They reduce housing consumption, increase saving and insurance, and decrease investment in risky assets even three to four decades after the programme. The findings are consistent with the literature that consumer behaviour changes following economically hard times. Romer (1990) and Crafts & Fearon (2010) find that consumption on durable goods dropped sharply during the Great Depression. In addition, the depression babies who experienced low returns from stocks and bonds invest less in risky assets throughout their lifetime.

How to explain the long-term conservative behaviour after experiencing an adversity? I suggest that one interpretation lies in the habits formed during adversity. In the scenario of rustication, the sent-down individuals experienced depressed housing consumption during the rustication (Bonnin, 2013). Following the habit-forming model (Becker & Murphy, 1988; Abel, 1990; Orphanides &

[22] For individuals (in this case, the identical twins) never sent to the rural areas, I assign their initial years of rustication to 0 and add dummies equal 1 if the values are imputed. Thus the regression is a variation from Eq. (12): $y_{1j} - y_{2j} = \lambda_1(rus_{1j} - rus_{2j}) + \lambda_2(sentyear_{1j} - sentyear_{2j}) + \lambda_3(impute_{1j} - impute_{2j}) + (X_{1j} - X_{2j})\lambda_X + \varepsilon_{1j} - \varepsilon_{2j}$.

Zervos, 1994, 1995; Crawford, 2010), if their stock of housing consumption drops below a critical level at the end of the rustication, their lifetime consumption is expected to converge to a low steady state. Empirical evidence that the effects of rustication mainly derive from the intensity rather than the incidence supports this interpretation. The longer the rusticated years, the more likely it is that the housing consumption converges to a steady state. Consequently, saving can be expected to increase. What is worth mentioning is that, the habit interpretation does not exclude other possibly co-existing mechanisms.

This research fits with the literature on how adversity, such as economic recession, wars, or other traumatic life experiences, influences long-term economic behaviour (Bellows & Miguel, 2009; Blattman, 2009; Malmendier & Nagel, 2011; Schoar & Zuo, 2013; Benmelech & Frydman, 2014). It also contributes to studies on migration (Conquest, 1987; Mitchneck & Plane, 1995; Fearnside, 1997; Viola, 2007), and stands out as an analysis of the largest inner-country migration. Furthermore, it provides evidence on how a policy, and especially one applied in the early stage of life, influences long-term socioeconomic development. The future research agenda includes a general equilibrium analysis on the effects of rustication on cross-sectional inequality and inter-generational investment, its long-term effects on the connection between urban and rural areas, and on rural development.

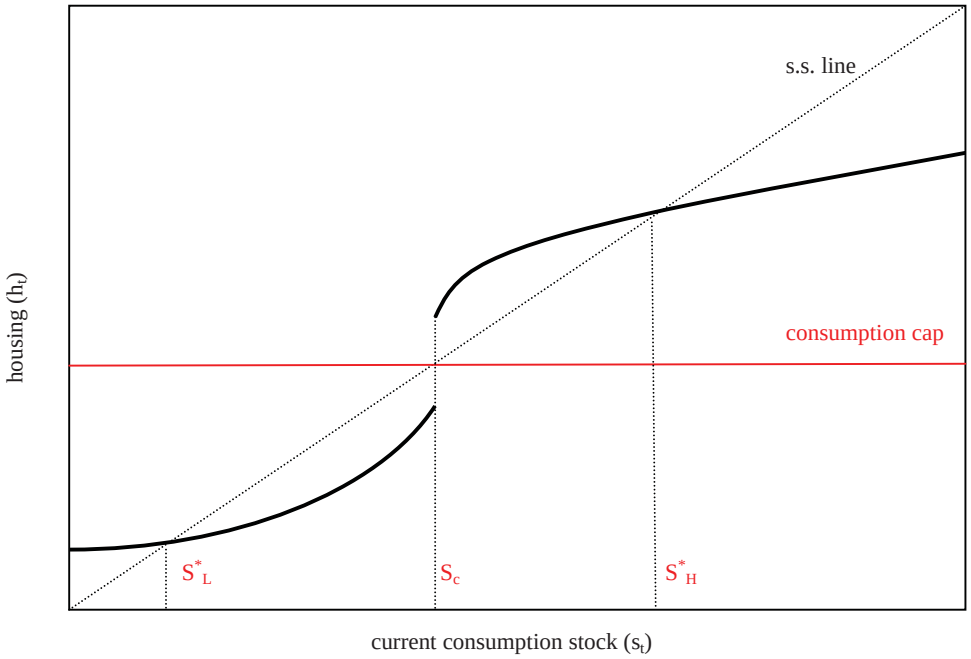
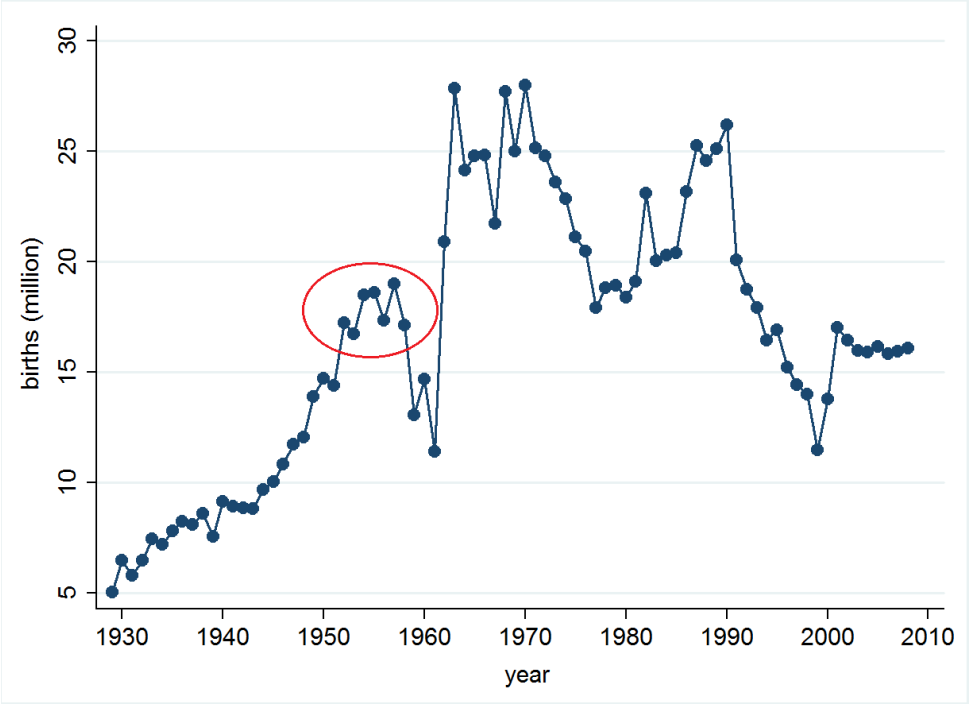
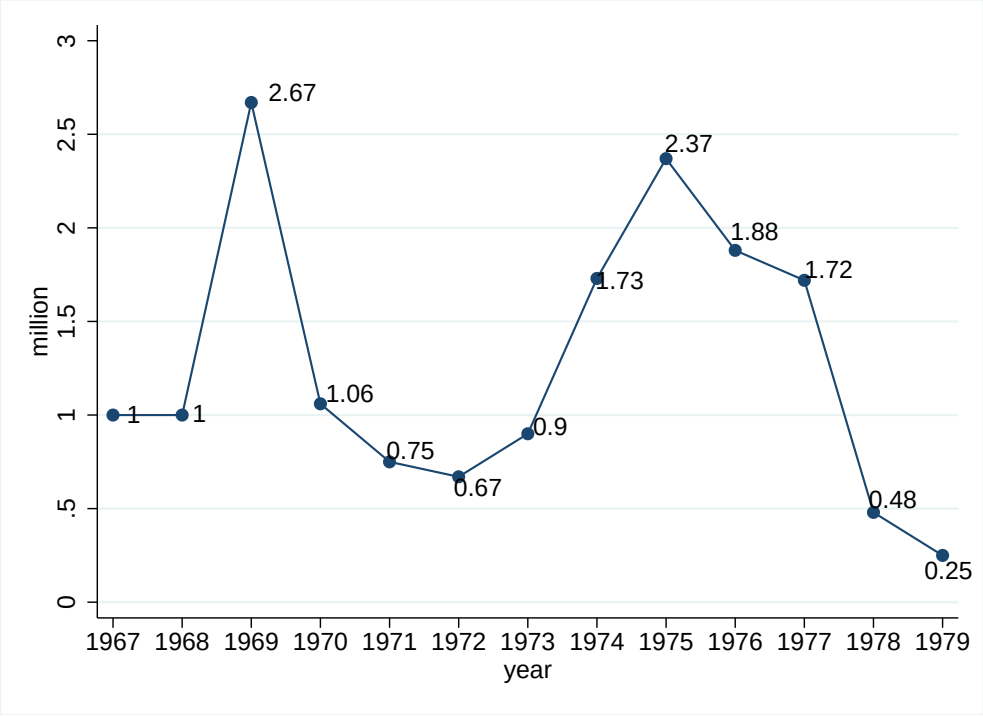


Figure 1: Illustration of Rustication Dynamics in an Optimisation Problem with Multiple Steady States



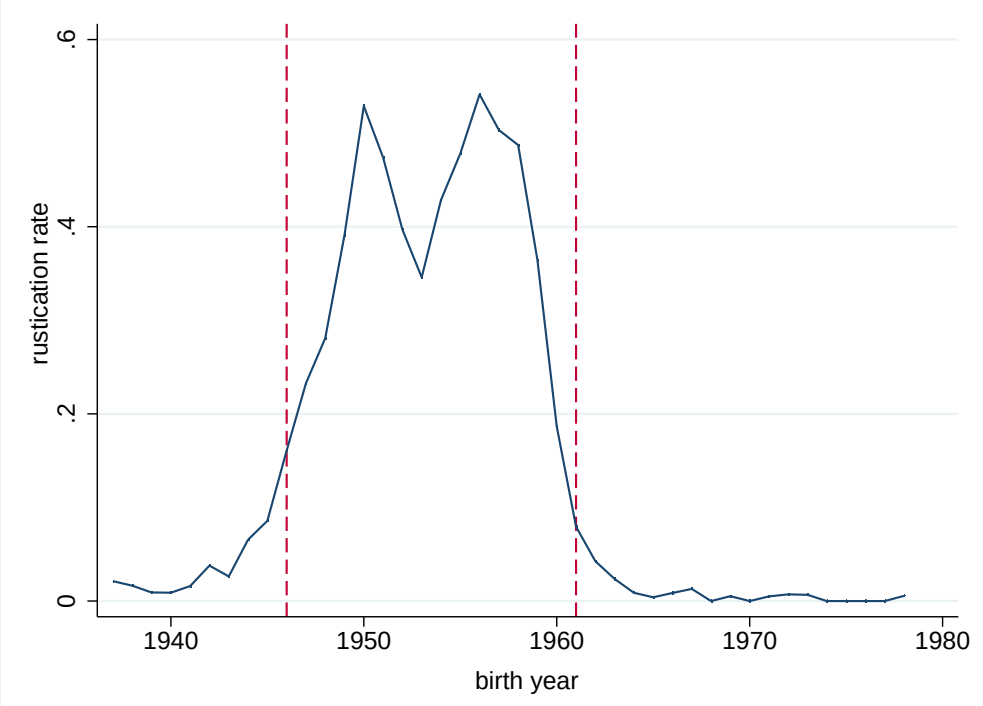
Data source: National Bureau of Statistics of China.
The red line circles the first baby boom after the foundation of P.R.China in 1949.

Figure 2: Number of Births in China (1930 - 2010)



Data source: Kojima (1996).

Figure 3: Number of Rusticated Youths

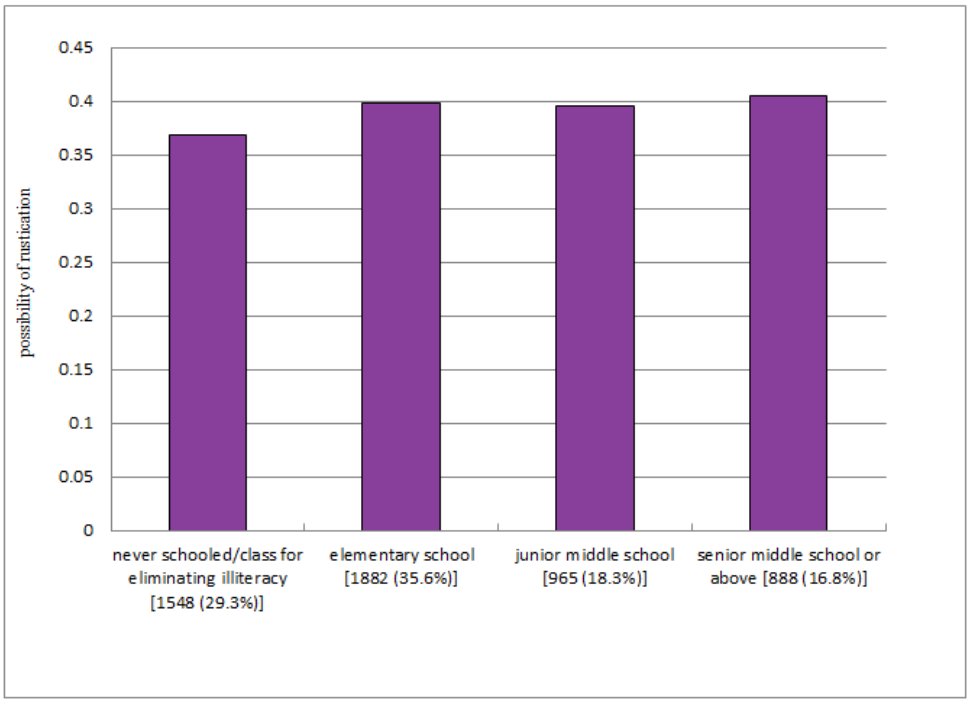


Data source: Chinese Household Income Project 2002.

Figure 4: Rustication Rate in Each Cohort

Data source: Bonnin (2013).

Figure 5: Migration in the Rustication



Data source: Chinese Household Income Project 2002.

Figure 6: Variation in the Possibility of Rustication by Father's Educational Status

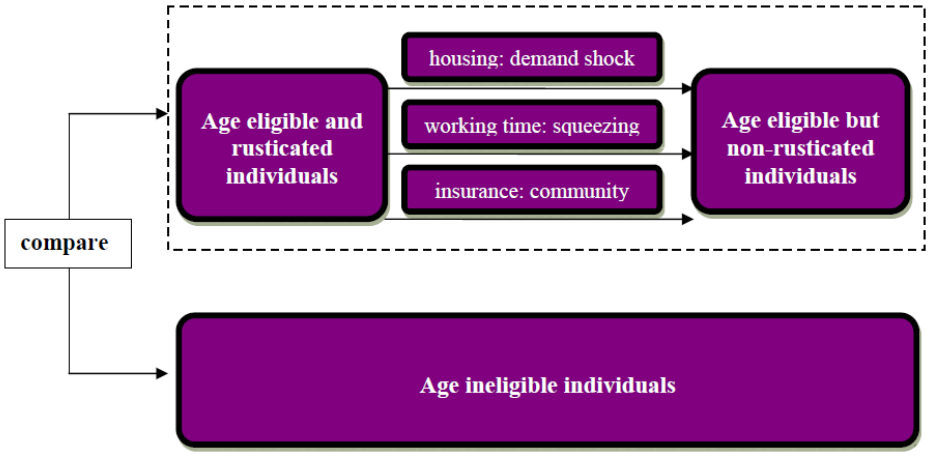


Figure 7: An Illustration on the Spill-over Effect of Rustication

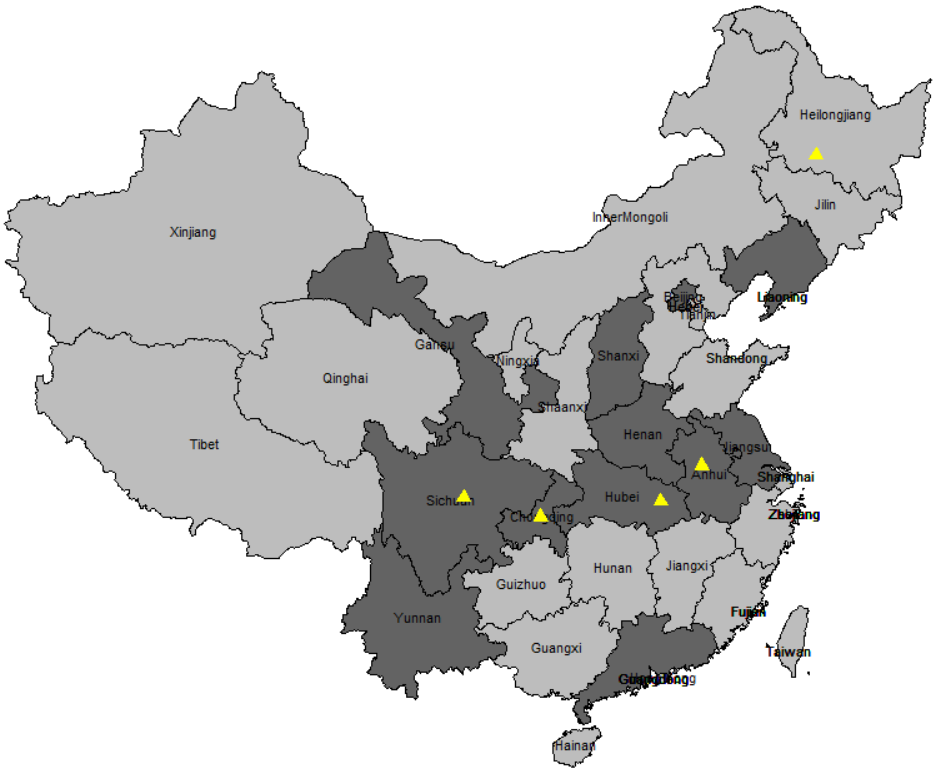
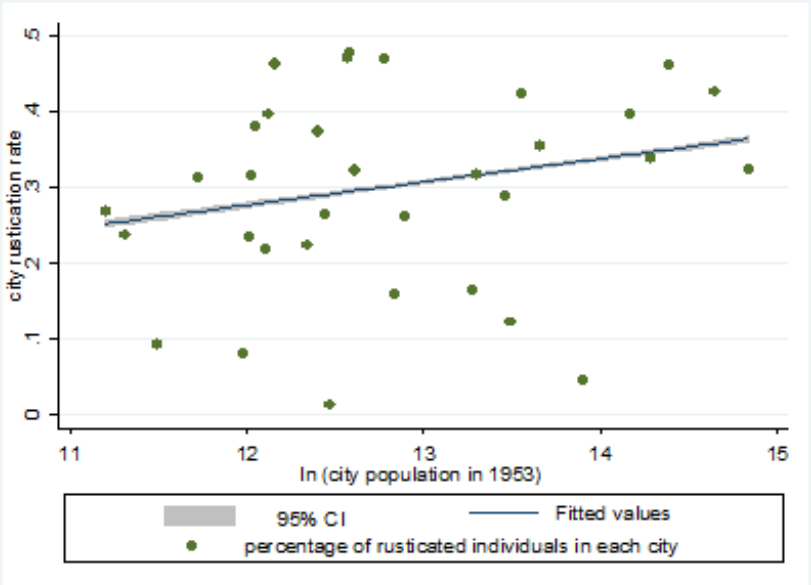


Figure 8: Data Coverage in the Chinese Household Income Project 2002, Chinese Twins Survey 2002, and mini-census 2005



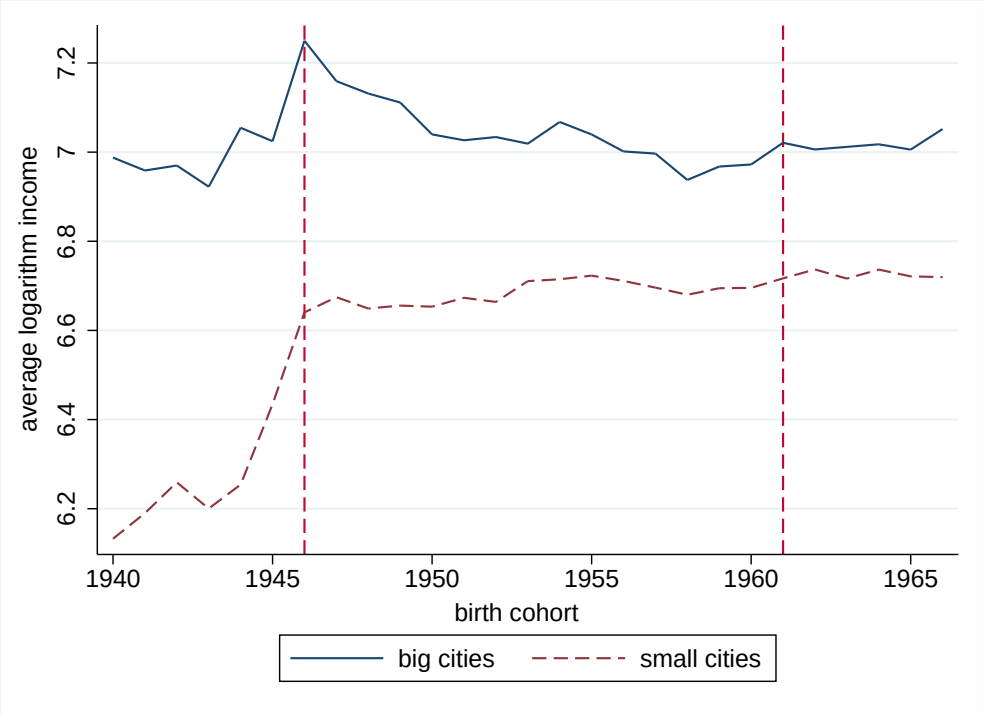
rustication rate = -0.088 + 0.03 ln (city population in 1953)
(0.197) (0.015)

Data source: Chinese Household Income Project 2002 and Census 1953.

Figure 9: Rustication Rate and City Population in 1953

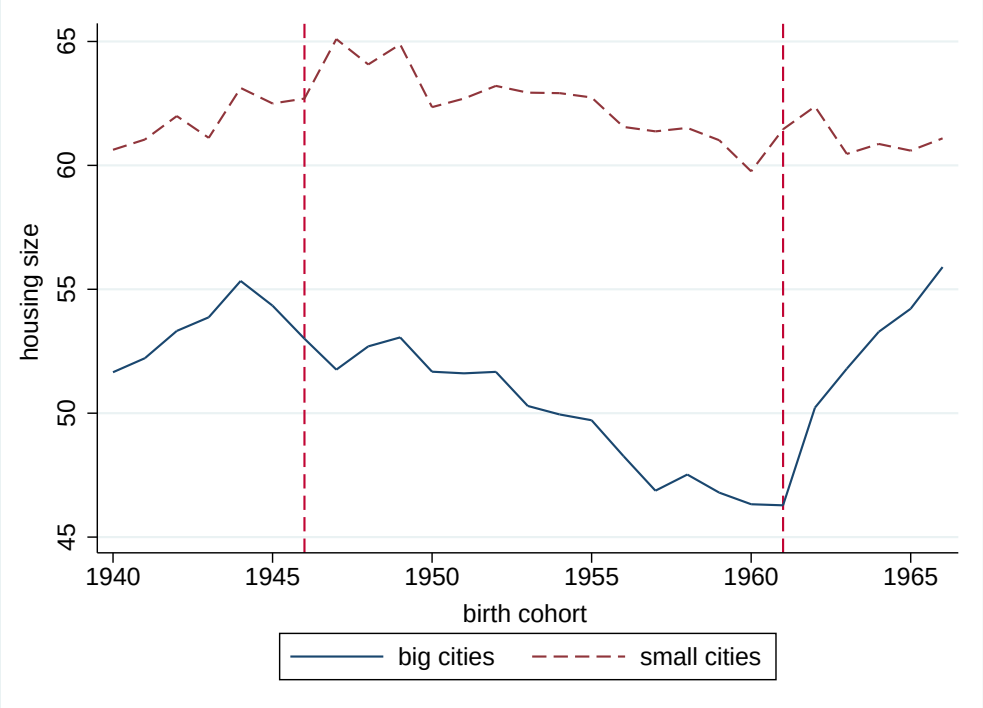
Data source: Mini-census 2005.

Figure 10: Senior High School Rate in Each Cohort



Data source: Mini-census 2005.

Figure 11: Average Logarithm of Monthly Income in Each Cohort



Data source: Mini-census 2005.

Figure 12: Housing Size (square metres) in Each Cohort

Table 1: Summary Statistics for the Rusticated Generation (Birth Cohort 1946-1961)

	Mean (Standard deviation)			
	Mini census 2005	CHIP 2002	Identical twins 2002	All siblings 2002
	(1)	(2)	(3)	(4)
Age	49.75	48.02	47.19	47.81
	(7.39)	(4.13)	(3.93)	(4.04)
Gender (male = 1)	0.52	0.49	0.48	0.48
	(0.50)	(0.50)	(0.50)	(0.50)
Being rusticated	-	0.42	0.54	0.45
(yes = 1)	-	(0.49)	(0.50)	(0.50)
Rusticated years	-	3.89	3.40	4.02
(conditional on rustication)	-	(2.66)	(3.46)	(3.29)
Senior high school	0.45	0.59	0.54	0.50
or above	(0.50)	(0.49)	(0.50)	(0.50)
University or above	0.05	0.05	0.05	0.05
	(0.22)	(0.21)	(0.21)	(0.22)
Annual income (USD)[a]	1,630.07	1,447.50	1,391.79	1,242.76
	(1,507.98)	(1,066.13)	(2,153.70)	(1,898.29)
Housing size (m^2)	58.92	50.13	60.35	58.66
	(41.14)	(22.76)	(40.81)	(38.55)
Private housing (=1)	-	-	0.77	0.78
	-	-	(0.42)	(0.41)
Housing value (USD)[b]	7,645.06	10,135.41	-	-
	(14,623.06)	(11,798.46)	-	-
Saving (USD)	-	4,341.84	-	-
	-	(5,162.82)	-	-
Investment on stocks	-	828.14	-	-
And bonds (USD)	-	(2,679.77)	-	-
Annual insurance	-	194.96	-	-
expenditure (USD)	-	(756.40)	-	-
Unemployment insurance	0.30	-	-	-
(purchased = 1)	(0.46)	-	-	-
Pension	0.62	-	-	-
(purchased = 1)	(0.49)	-	-	-
Health insurance	0.61	-	-	-
(purchased = 1)	(0.49)	-	-	-
Monthly working days	-	22.86	22.27	22.38
	-	(3.89)	(5.76)	(5.59)
Weekly working hours[c]	45.56	40.25	42.88	42.87
	(10.96)	(6.73)	(15.14)	(15.71)
Observations[d]	223,722	4,469	602	4,866

Notes: [a] Annual income in Columns (1) and (2) is transferred from monthly income.
[b] Housing price in Columns (1) and (2) is purchasing price and estimated market price respectively.
[c] The weekly working hours in Column (2) is transferred by daily working hours*5, as the legal weekly working days are five in China in 2002.
[d] Number of observations varies slightly in the specifications for income, housing consumption, working time, saving, investment, and insurance, due to missing values.

Table 2: The Long-Term Effects of Rustication on Housing Consumption

	Housing Consumption			
	(1)	(2)	(3)	(4)
Panel A. Difference-in-Difference Estimates - Mini Census				
	Housing size (m^2)		Purchasing price	
	big city * cohort	population * cohort	big city * cohort	population * cohort
1946-1961 vs.	-4.663***	-1.347***	-621.0**	-231.4**
others in 1940-1966	(1.134)	(0.324)	(315.1)	(101.8)
Observations	223,625	147,908	187,538	120,033
1946-1950 & 1954-1958 vs.	-4.584***	-1.357***	-594.8*	-231.5***
1941-1945 &1962-1966	(1.115)	(0.320)	(309.6)	(83.1)
Observations	169,159	110,930	142,369	90,615
Panel B. OLS Estimates - Control Family Background Explicitly (CHIP)				
	Housing size (m^2)		Purchasing price	
Being rusticated (=1)	-1.760*		-796.2**	
	(0.994)		(324.0)	
Rusticated years		-0.516***		-186.8***
		(0.154)		(61.5)
Observations	4,289	4,289	4,338	4,338
Panel C. Twin Fixed-Effects Estimates - Identical Twins				
	Housing size (m^2)		Property rights (private=1)	
Being rusticated (=1)	-3.653		-0.006	
	(2.714)		(0.058)	
Rusticated years		-0.806**		-0.005
		(0.362)		(0.009)
Observations	584	584	570	570
Panel D. Family Fixed-Effects Estimates - All Siblings				
	Housing size (m^2)		Property rights (private=1)	
Being rusticated (=1)	-2.976		-0.019	
	(2.393)		(0.046)	
Rusticated years		-0.535*		-0.0061
		(0.319)		(0.006)
Observations	826	826	788	788

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies. In addition, schooling years, number of household members, and income are controlled in Panels B-D. Father's social, educational, and political status are also controlled in Panel B.

Table 3: The Long-Term Effects of Rustication on Saving and Investment

	Saving and Investment (CHIP 2002)					
	Ln (saving)[a]		**Stocks & bonds/income**		**Stocks / income**	
	(1)	(2)	(3)	(4)	(5)	(6)
Being rusticated (=1)	0.065*		-0.111		-0.095	
	(0.037)		(0.122)		(0.097)	
Rusticated years		0.003		-0.032*		-0.025*
		(0.006)		(0.018)		(0.014)
Observations	3,968	3,968	4,338	4,338	4,338	4,338

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, age, schooling, regional dummies, father's social, educational, and political status. In the specifications for saving, income is also controlled.

[a] Savings contain fixed and current deposits, stocks and bonds, and monetary value of commercial insurance as a deposit.

Table 4: The Long-Term Effects of Rustication on Insurance and Pension

Insurance Purchase						
Panel A. Difference-in-Difference Estimates - Mini Census 2005						
	Purchase=1					
	big city * cohort			population * cohort		
	unemployment	pension	health	unemployment	pension	health
	(1)	(2)	(3)	(4)	(5)	(6)
1946-1961 vs.	0.031	0.031***	0.043***	0.009	0.009***	0.012***
others in 1940-1966	(0.019)	(0.008)	(0.008)	(0.006)	(0.003)	(0.003)
Observations	223,705	223,705	223,705	147,944	147,944	147,944
1946-1950 & 1954-1958 vs.	0.006	0.041***	0.050***	-0.0006	0.012***	0.013***
1941-1945 &1962-1966	(0.020)	(0.009)	(0.009)	(0.006)	(0.003)	(0.003)
Observations	169,225	169,225	169,225	110,959	110,959	110,959
Panel B. OLS Estimates -Control Family Background Explicitly (CHIP 2002)						
	Insurance expenditure					
	(1)			(2)		
Being rusticated (=1)	51.27*					
	(30.24)					
Rusticated years				7.14		
				(5.32)		
Observations	4,338			4,338		

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies. In addition, schooling years, income, and father's social, educational, and political status are controlled in Panel B.

Table 5: The Long-Term Effects of Rustication on Education

	Education			
	Senior high school or above		University or above	
	(1)	(2)	(3)	(4)
Panel A. Difference-in-Difference Estimates - Mini Census				
	big city * cohort	population * cohort	big city * cohort	population * cohort
1946-1961 vs.	-0.052***	-0.017***	-0.027***	-0.010***
others in 1940-1966	(0.015)	(0.004)	(0.005)	(0.001)
Observations	223,722	147,951	223,722	147,951
1946-1950 & 1954-1958 vs.	-0.047***	-0.014***	-0.025***	-0.010***
1941-1945 &1962-1966	(0.015)	(0.004)	(0.004)	(0.001)
Observations	169,238	110,963	169,238	110,963
Panel B. Probit/OLS Estimates - Control Family Background Explicitly (CHIP)				
Being rusticated (=1)	0.009		0.003	
	(0.019)		(0.007)	
Rusticated years		-0.009***		-0.003***
		(0.003)		(0.001)
Observations	4,465	4,465	4,465	4,465
Panel C. Twin Fixed-Effects Estimates - Identical Twins				
Being rusticated (=1)	-0.011		-0.044*	
	(0.485)		(0.027)	
Rusticated years		-0.007		-0.005
		(0.007)		(0.003)
Observations	602	602	602	602
Panel D. Family Fixed-Effects Estimates - All Siblings				
Being rusticated (=1)	0.011		0.005	
	(0.017)		(0.008)	
Rusticated years		-0.002		0.0002
		(0.003)		(0.002)
Observations	4,866	4,866	4,866	4,866

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies. Father's social, educational, and political status are also controlled in Panel B.

Table 6: The Long-Term Effects of Rustication on Income

Ln (income)		
	(1)	(2)
Panel A. Difference-in-Difference Estimates - Mini Census		
	big city * cohort	population * cohort
1946-1961 vs.	-0.004	-0.005
others in 1940-1966	(0.016)	(0.005)
Observations	117,128	75,504
1946-1950 & 1954-1958 vs.	0.013	0.0003
1941-1945 &1962-1966	(0.018)	(0.006)
Observations	88,563	56,399
Panel B. OLS Estimates - Control Family Background Explicitly (CHIP)		
Being rusticated (=1)	0.017	
	(0.023)	
Rusticated years		0.002
		(0.004)
Observations	4,338	4,338
Panel C. Twin Fixed-Effects Estimates - Identical Twins		
Being rusticated (=1)	0.075	
	(0.089)	
Rusticated years		0.017
		(0.013)
Observations	600	600
Panel D. Family Fixed-Effects Estimates - All Siblings		
Being rusticated (=1)	0.023	
	(0.026)	
Rusticated years		-0.003
		(0.006)
Observations	4,435	4,435

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies. In addition, schooling years, working years and the square form are controlled in Panels B-D. Father's social, educational, and political status are also controlled in Panel B.

Table 7: The Long-Term Effects of Rustication on Working Time

	Working Time			
	Monthly working days		Weekly working hours	
	(1)	(2)	(3)	(4)
Panel A. Difference-in-Difference Estimates - Mini Census				
	big city * cohort	population * cohort	big city * cohort	population * cohort
1946-1961 vs.	–	–	-0.091	0.009
others in 1940-1966	–	–	(0.206)	(0.067)
Observations	–	–	116,141	74,880
1946-1950 & 1954-1958 vs.	–	–	0.051	0.049
1941-1945 &1962-1966	–	–	(0.218)	(0.076)
Observations	–	–	87,850	55,954
Panel B. OLS Estimates - Control Family Background Explicitly (CHIP)				
Being rusticated (=1)	0.033		0.286	
	(0.149)		(0.212)	
Rusticated years		0.024		0.119**
		(0.023)		(0.056)
Observations	3,152	3,152	3,139	3,139
Panel C. Twin Fixed-Effects Estimates - Identical Twins				
Being rusticated (=1)	1.395		5.528***	
	(0.887)		(2.430)	
Rusticated years		0.295*		1.886***
		(0.170)		(0.517)
Observations	282	282	282	282
Panel D. Family Fixed-Effects Estimates - All Siblings				
Being rusticated (=1)	1.192		5.231**	
	(0.755)		(2.239)	
Rusticated years		0.199*		1.668***
		(0.103)		(0.341)
Observations	374	374	374	374

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies. In addition, schooling years are controlled in Panels B-D. Father's social, educational, and political status are also controlled in Panel B.

Table 8: The Long-Term Effects from Being Rusticated versus Rusticated Length

Twin Fixed-Effects Estimates					
	Housing size	Weekly working hours	Ln (income)	Senior high school/above	University/ above
	(1)	(2)	(3)	(4)	(5)
Being rusticated (=1)	-1.841	0.265	0.035	0.012	-0.042
	(2.924)	(3.557)	(0.096)	(0.052)	(0.028)
Rusticated years	-0.628*	1.849**	0.014	-0.008	-0.001
	(0.338)	(0.756)	(0.013)	(0.008)	(0.002)
Schooling	-0.431	0.387	0.040*		
	(1.027)	(0.586)	(0.023)		
Ln (income)	9.867***				
	(2.480)				
Number of household members	6.260***				
	(1.523)				
Observations	584	282	600	602	602

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, ethnics, age, and regional dummies.

Appendix

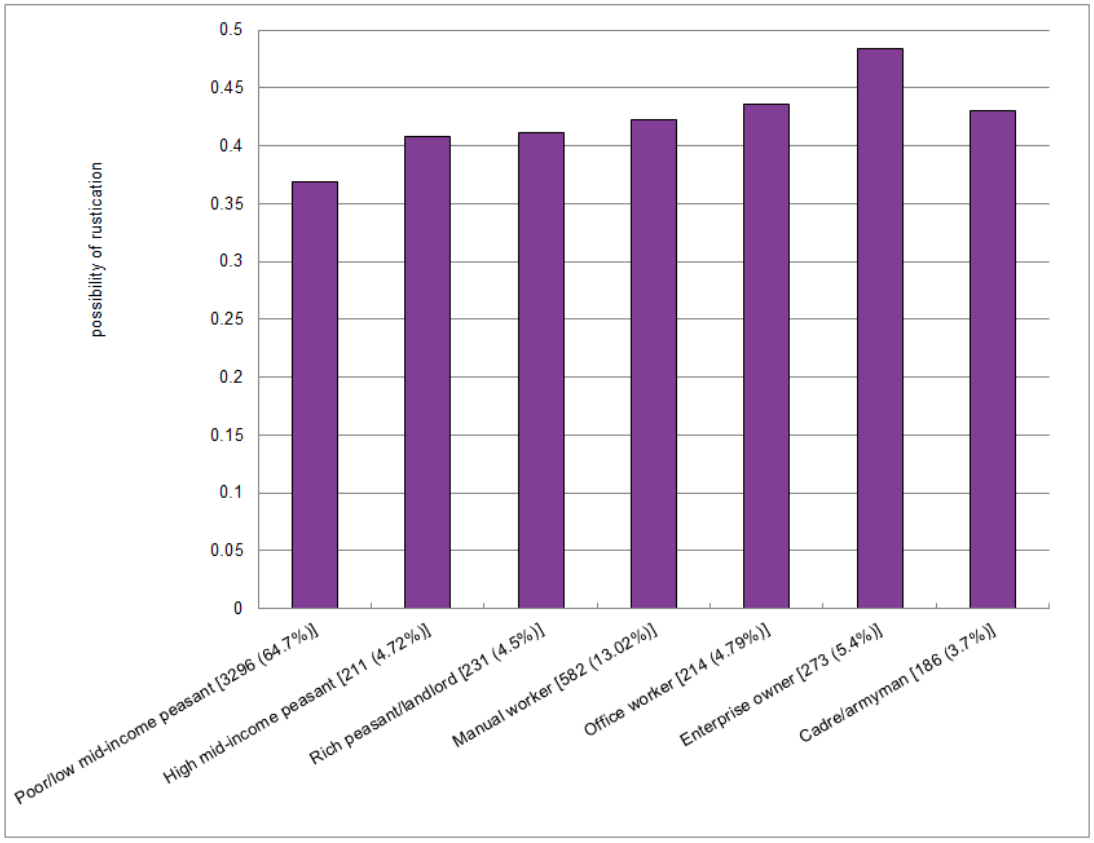
The Long-Term Effect of Rustication on Self Control and Self Reliance

As an exogenous shock, rustication transformed the youngsters' privileged urban status into an unprivileged rural one, and exposed them to unfamiliar environment. It is therefore expected to change their attitude toward others and control over themselves. Table A.5 presents my findings on the long-term effects of rustication on self control and self reliance.

Panel A presents the impact of rustication on self control ability, specifically on the capacity of controlling negative emotions, from the data of identical twins. The outcome variable is a dummy equal to 1 if an individual self-reports that he/she can always control anger or disgust. Otherwise it equals 0. Under twin fixed-effect estimation, I discover that individuals experiencing rustication are 17.5% and 18.1% more able to control anger and disgust respectively than their non-rusticated counterparts (Columns (1) and (3)). Both of the two estimates are at the 5% level of statistical significance. Similarly, with one more year of rustication, their capacity to inhibit negative emotion increases by 3%-4% (Columns (2) and (4)). Although the result is potentially subject to the self-report bias, it sheds light on the influence of rustication on non-cognitive skills (Zhang *et al.*, 2007).

Panel B shows the influence of rustication on self reliance. The outcome variable is a dummy of borrowing money from family or friends in emergency rather than from financial institutes with data from CHIP 2002. Columns (1) and (2) display the OLS estimates, while Columns (3) - (4) show the corresponding probit estimates, with family background controlled explicitly. With one additional sent-down year, an individual is about 0.4% less likely to borrow money from family members or friends in emergency, under both OLS and probit estimations (Columns (2) and (4)). Both of the two estimates are statistically significant at the 10% level of significance. In other words, they are more inclined to rely on themselves in the case of a financial crisis. The finding is consistent with Gong *et al.* (2014) that the rusticated individuals are less likely to believe in luck. Instead, they show more self reliance.

These findings are consistent with the literature that individual experiences affect psychosocial outcomes and shape attitude toward others. Blattman & Annan (2010) find that people exposed to severe war violence have higher psychological distress afterwards than those experiencing little war violence. Individuals with life traumatic experience, such as disease or divorce, are less likely to trust others (Alesina & La Ferrara, 2002). It is also coherent with the way that economic recession in the 2000s alters the Generation Y. They are reported to behave more modestly and hate conflicts (Groth & Giang, 2012).



Data source: Chinese Household and Income Project 2002.

Figure A.1: Variation in the Possibility of Rustication by Father's Social Status

Table A.1: Tabulation of Rustication Years

Years of rustication (conditional on being rusticated)	
	count (percent)
1 year	114 (5.89)
2 year	482 (24.88)
3 year	538 (27.77)
4 year	262 (13.53)
5 year	201 (10.38)
6 year	90 (4.65)
7 year and above	250 (12.91)
Mean	3.89 years
Observations	1,937

Notes: The data is from the Chinese Household Income Project 2002.
The sample is restricted to individuals born between 1946 and 1961.

Table A.2: Variation in Rustication within Identical Twins

Variation in rustication within twins	
Neither rusticated	186
	(30.90)
One rusticated	180
	(29.90)
Both rusticated	236
	(39.20)
Observations	602

Notes: The data is from the Chinese Twins Survey in 2002.
The sample is restricted to identical twins born between 1946 and 1961.

Table A.3: Robustness Checks (Twin Fixed-Effect Estimates)

	Twin Fixed-Effect Estimates - Identical Twins		
	Housing size	working days/month	working hours/week
	(1)	(2)	(3)
	Panel A. Control for initial endowment (birth weight)		
Being rusticated (=1)	-3.068	0.752	3.532*
	(2.824)	(0.759)	(2.038)
Rusticated years	-0.767**	0.262	1.745***
	(0.366)	(0.177)	(0.535)
Observations	572	272	272
	Panel B. Control for working sector and occupational type[a]		
Being rusticated (=1)	-5.524	1.388*	5.550**
	(3.488)	(0.802)	(2.265)
Rusticated years	-1.492**	0.246	1.833***
	(0.606)	(0.162)	(0.440)
Observations	270	282	282
	Panel C. Control for spouse's traits[b]		
Being rusticated (=1)	-9.366**	0.646	4.230
	(4.625)	(1.327)	(3.747)
Rusticated years	-1.880	0.174	2.236**
	(1.223)	(0.244)	(0.871)
Observations	192	134	134
	Panel D. Control for the initial year of being rusticated		
Being rusticated (=1)	-0.073	2.591***	0.967
	(2.485)	(0.328)	(1.045)
Rusticated years	-0.610*	0.168	1.830**
	(0.336)	(0.280)	(0.764)
Observations	584	282	282

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Schooling years, income, and number of household members are controlled in the specification for housing size. Schooling years are controlled in the specification for working time.

[a] Working sector equals 1 if an individual is in the state-owned sector. Otherwise it equals 0. Occupational type equals 1 if an individual works with white-collar job. Otherwise it equals 0.

[b] Spousal traits include schooling and working sector.

Table A.4: The Long-Term Effects of Rustication on Occupational Choice

	Twin Fixed-Effect Estimates - Identical Twins					
	State-owned sector (=1)		White collar (=1)		Self-employment (=1)	
	(1)	(2)	(3)	(4)	(5)	(6)
Being rusticated (=1)	0.018		0.004		0.018	
	(0.087)		(0.078)		(0.034)	
Rusticated years		-0.011		0.011		0.013
		(0.018)		(0.020)		(0.013)
Observations	292	292	286	286	292	292

Notes: The sample is restricted to identical twins born between 1946 and 1961.
Schooling years are controlled in all specification.

Table A.5: The Long-Term Effects of Rustication on Self Control and Self Reliance

Self Control and Self Reliance				
	(1)	(2)	(3)	(4)
Panel A. Emotional control (identical twins)				
	anger control		disgust control	
Being rusticated (=1)	0.175**		0.181**	
	(0.079)		(0.079)	
Rusticated years		0.042***		0.030**
		(0.015)		(0.014)
Observations	272	272	270	270
Panel B. Borrow money from family/friends (CHIP)				
	OLS		Probit	
Being rusticated (=1)	-0.017		-0.017	
	(0.017)		(0.017)	
Rusticated years		-0.004*		-0.004*
		(0.003)		(0.002)
Observations	4,357	4,357	4,357	4,357

Notes: robust standard errors are displayed in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. Additional regressors in all specifications include gender, age, schooling, and regional dummies. Father's social, educational, and political status are controlled in Panel B.

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