Reflections on Higher Education Expansion: An Empirical Study of Return to Education for Rural and Urban Residents in China

Jie Ding

International Office, Xi'an Eurasia University, Xi'an, China

dingjie@eurasia.edu

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Abstract: China's higher education has moved from the mass to universalization, with an enrolment rate rising from 15% in 2002 to 51.6% in 2019. Based on "human capital" theory, it is generally believed that this expansion will lead to increasing social and individual return. However, as this burgeoning growth only took 17 years, some researchers concerned on its possible negative effects such as the unguaranteed education quality, the enlarged educational inequity, and education inflation, etc. As little research has done to explore the impact of education expansion on above problems, this paper, based on the latest data set of CGSS 2017, aims to reflect on the higher education expansion from the perspectives of overall return rate, the rural-urban discrepancy and the potential generation differences. This study adopted Mincer's model as the base for return to education and OLS as the estimator for the regression analysis. The results showed that overall return to education for the chosen sample (N=5043) was 9.4%, and the return rate in urban areas (11.3%) was much higher than rural areas (6.7%). Meanwhile, the return rate for sampling group 2 (respondents born during 1980-1999) was 13%, significantly higher than that of group 1 (respondents born during 1960-1979), at 7.8%. It is also found that contradictory to rural-urban widening income gap between group 1 and 2, their difference in educational return rate turned to be slight (12% and 12.9%), so it revealed that other factors such as the quality of education or family background might be more influential for the urban-rural inequity.

1. Introduction

The preceding two decades has witnessed China's higher education transforming from elite to universalization. Holding the belief that increasing higher education enrolment would improve the social productivity, Chinese government has actively adopted privatized and marketized strategies to create education opportunities to meet the pressing demand for tertiary education. Education, instead of a consumer good, has been regarded as a necessary investment which enhances both individual competence and national comprehensiveness. However, it should be noted that universalization means the overall increasing amount of admission opportunity, while imbalanced regional discrepancy and stratification are aggravating, marketized educational system are burdening poor and disadvantaged families down with the rising tuition. (Yang, S. & Sun, M., 2020). This paper will focus on the effects of expansion in higher education, especially the different value of education for rural and urban residents in China by analysing the return to education in recent twenty years.

Despite a latecomer, Chinese government has made remarkable achievement in increasing higher education enrolment, burgeoning from 12.5% in 2000 to 51.6% in 2019 (See Figure 1). Based on Martin Trow 's three stages theory, China's higher education has crossed elite-mass-universal triptych in a short period of time. The data given by China's Ministry of Education (MoE) manifested that China has massively expanded the number of universities from 1041 in 2000 to

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2688 in 2019, with an increasing scale of school students from 4.27 million in 2000 to 30.31 million in 2019 (Education, General Information of Chinese Education, 2020). Nonetheless, besides the general amelioration in life opportunities, universalization of higher education does not guarantee more equal chances in higher education admission. Mei and others (2017) analysed the data of 39 first-tier Chinese universities and pointed out that their local students took up 20% to 50% due to the indulgence of local distribution policy, whereas the admission chance of students in poor west regions (Gansu, Ningxia and Xinjiang etc.) dropped slightly. Thus, education inequality becomes severe abreast with the latest admission quota policy (Wang et al., 2017).

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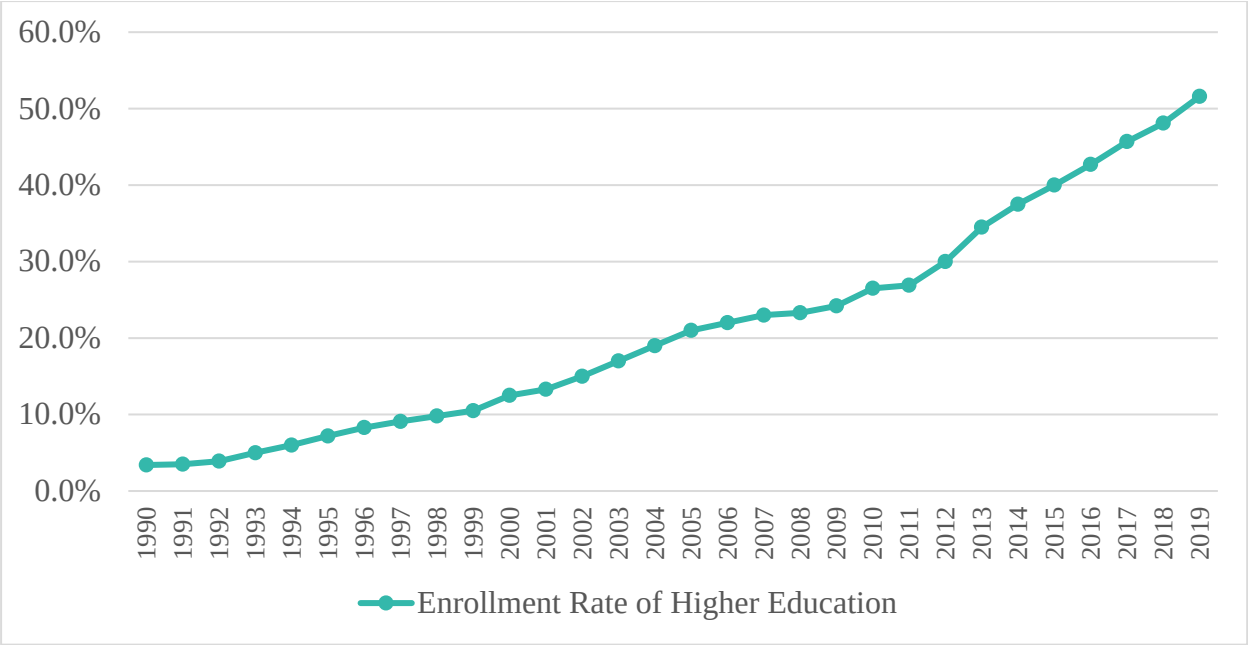

Figure 1: Enrolment rate of higher education

Moreover, the expansion of tertiary education makes education hierarchy a pyramid where the top tiers are increasingly difficult to reach. In China, the quality of universities varies a lot in the realms of teachers' qualification, students' performance and financial investment. Most universities where rural students are engaged are provincial or county public universities and private institutions which are regarded in the lagging ranks. The first-tier universities in China are generally referred as "985" and "211". Although they occupied around 70 percent of government funding (Education, General Information of Chinese Education, 2020), the total number and scale of those top university almost kept unchanged during the past two decades. In contrast, the quantity of private institutions and provincial public universities exhibited a drastic upward trend. The following Figure 2 shows the uneven climbing of different kinds of universities.

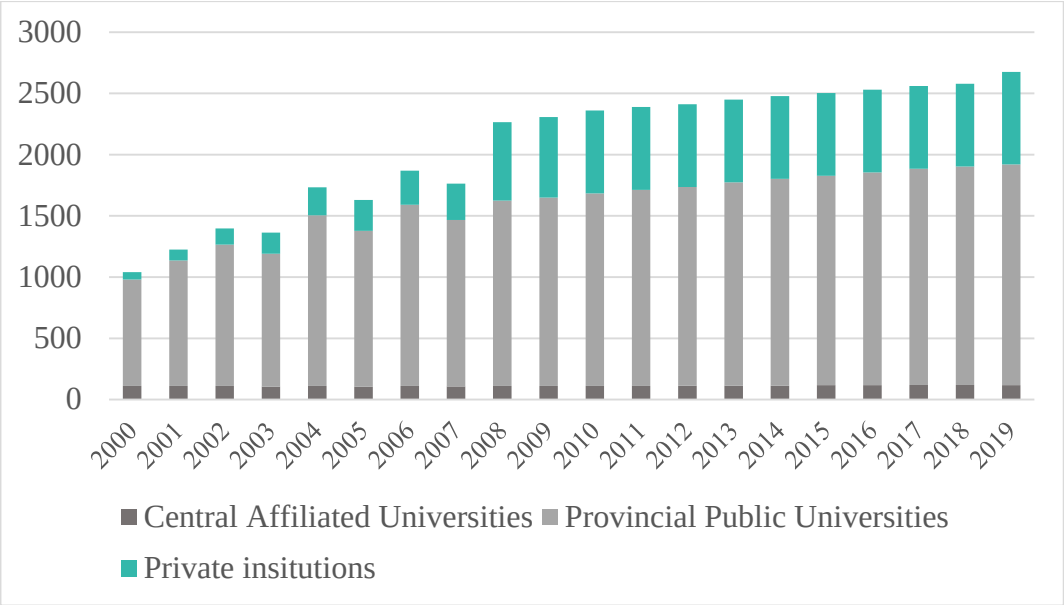

Figure 2: The Increasing number of Chinese Universities from 2000 to 2019

Source: Education, General Information of Chinese Education, MoE, 2020

Based on the hierarchy theory (Liu, 2018), the lower proportion of admission to top universities pushes the high-ability students to work even harder, while leaving little chance for the rural students who grow up in poor education conditions. The following Figure 3 illustrates the change of distribution of three types of universities in China in 2000 and 2019 respectively. The two pyramids show that the expansion of universities is not normally distributed, and the increasing number mainly comes from the general universities and vocational colleges, which raise strong doubt on the quality of current higher education.

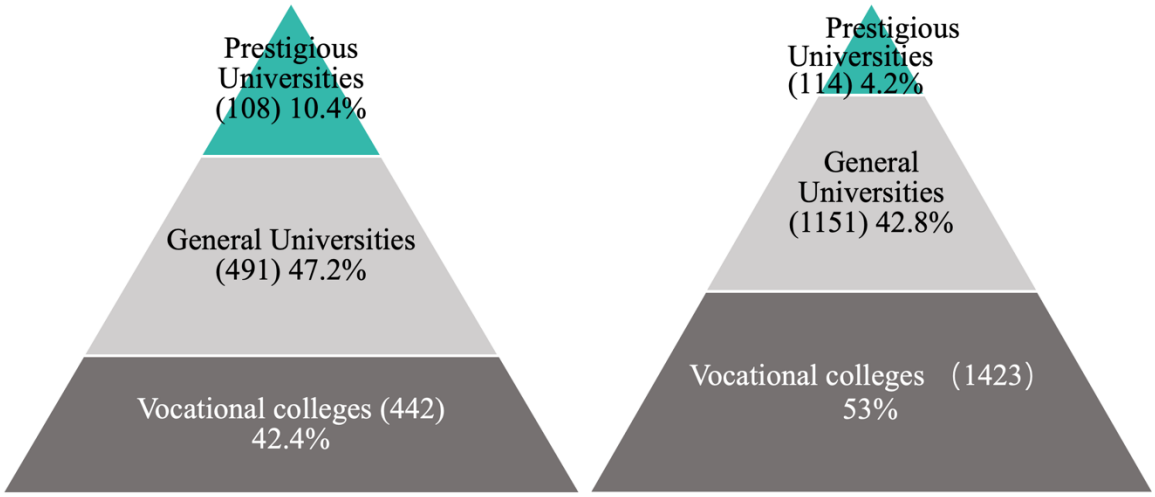

Figure 3: The change of distribution of three types of universities in 2000 and 2019

In the pyramids, prestigious universities involve the total amount of “985” and “211”; general universities refer to number of other Chinese universities (except “985” and “211”) that can deliver bachelor degree and higher-level degrees; vocational colleges include all institutes that are qualified for diploma programs but not degree ones. (Source: Education, General Information of Chinese Education, 2020)

In addition, early cohorts who were involved in the higher education has graduated and flooded into the labour market, increasing the proportion of college-educated workers. Therefore, more companies might use diploma as a benchmark to evaluate the performance of individuals, and this instigates more frustration if rural students are not involved in the universities or enrolled in an

ordinary one, which put them in inferior roles in the job market. In other words, universalization of higher education makes it a costly sorting device to enable employers to identify more capable individuals. In this way, rural students who mainly went to vocational education or dropped out after high school lost most of their employment opportunities before they show their capabilities.

With regard to the return to education, it is widely analysed in both individual and social level from pecuniary and nonpecuniary perspectives. Social returns mostly involve the correlations of school enrolment rates and per capita gross domestic product (GDP) growth (Sianesi, B & Reenen, J.V., 2003). This research focuses on micro perspective to explore the discrepant rate of return to higher education for rural and urban residents in China by analysing the latest datasets of Chinese General Social Survey (CGSS 2017). Firstly, the per capita disposable income in China in 2019 was 30,733 Yuan a year (National Statistics Bureau 2020), which is much lower than that in developed countries; thus, return to education is an important factor people need to consider before investing in education. Also, the analysis could help to determine the urban-rural disparity (Wang & Wu, 2018). More importantly, return to education is a notable indicator to measure the value of education and the connotation of education and labour market. Therefore, the research of return to education will be valuable in identifying the effectiveness of higher-education expansion on benefiting urban-rural residents.

2. Literature Review

2.1. The effect of universalization of Higher Education

American Socialist Martin Trow emphasized that the expansion of higher education originates from social activities and configuration, embodying the adoption to extensive population and technical reformation. Higher education, serving as a catalyst in the competition of social stratification, features hierarchy, categorization and inequality, so narrowing the disparity caused by marketing factors should be stressed (Reimer, D. & Pollak, R., 2010). Also, the increasing number of college attendants leads to fiercely intensified competition and devaluation of graduates in job market (Hannum & Buchmann, 2003). When more graduates occupy the job market, the overall standard of recruitment has increased (Fan, 2013), motivating higher-level education investment. Lucas (2001) asserted that inflated credentialism would effectively maintain the inequality, and once the demand was saturated, the disproportion in quantity would be replaced by that in quality.

2.2. Urban-rural inequality

Urban-rural inequality is one of the thorniest issues that China is confronting with. Much research has focused on the impact of household registration system (named as “hukou”) (Tomlinson, 2008). Fu and Ren (2010) found that the places of origin and hukou status (agricultural or non-agricultural) influences an individual’s years of education, occupation, income, and the return to education. For the access to higher education, government policies such as the quota system and registered hukou exacerbate urban-rural inequalities. Students from higher socioeconomic status (SES), rich family backgrounds and more urban homes have higher chances in admitting to prestigious universities (Jia et al., 2017; Liu, 2015). On the contrary, education in rural areas is bearing more constraints in teaching materials, number of qualified teachers, and funding for school facilities; thus, the first nine-year lower quality education makes Gaokao system relatively “unfair” for the rural poor (Wang & Wu, 2018).

2.3. Human Capital Theory and Mincer’s Model

The human capital theory is highly influential in the research of the return to education. The term “human capital” was proposed by Mincer, whose earnings function analyzed the relationship between human capital investment and personal income differences (Mincer, 1974). Mincer’s model is widely used as the tool of empirical economic analysis to estimate the private returns to schools (Sianesi, B & Reenen, J.V., 2003). The equation is as follow:

$$LnY=\beta_0+\beta_1 edu+\beta_2 exp+\beta_3 exp^2+\varepsilon \quad (1)$$

In this equation, Y represents the individual income. edu is years of education, while exp is years of work, exp^2 is the square of work experience to reflect the non-linear relationship between work experience and income. ε indicates a normally distributed error terms (e.g. gender, region, family background, industry and health etc.) (Mincer, 1974). The human capital theory states that earning of individuals are determined by investment in human capital, and education investment and job training are dominant capital investment. In this way, β_1 represents the rates of returns to school education, and β_2 represents the returns to job experience.

2.4. Review of Previous Studies

Much of research has focused on the return to education in China, illustrating a general rising trend. Zhang & Kanbur (2005) have reviewed the return to education from 1988 to 2000, revealing a growing number from 4.7% to 11.5%. Hu and Hibel (2015) also identified an overall rise from 2003 to 2010, meanwhile more scholars shed light on the increasing heterogeneity of return to education such as the urban-rural discrepancy and socioeconomic status difference (Fu & Ren 2010). Since higher education expansion, researchers focused on its effect on education equity. Developed countries, such as the United States and United Kingdom, have adopted the college-expansion policy to reduce social inequality (Hannum & Buchmann, 2003). It is also found that the upper status and high-income families harvested more optimal effect, while the return in rural areas was much lower (Hu & Hibel 2015; Wang & Wu 2018).

Overall, most previous studies estimated a rising trend in return to education from the quantity of education such as years of schooling, while the growth tendency in the 21st century is uncertain and fluctuated. Moreover, when higher education entered into the universal stage, it is necessary to analyze its impact on the growth rate of return to education, especially casting an eye on the heterogeneity between urban and rural residents, and other influential factors such as gender, the health and the industry they engaged in.

2.5. Research Questions and Hypothesis

Although previous research literature has generally shown positive returns of education, the heterogeneity has also been recognized. In this study, the researching question involves the changing tendency in past two decades and the inconsistency between urban and rural areas for the return to education. Moreover, it will also bring in some individual factors including gender, health and their industry to identify their impact on return of education. Three hypotheses are proposed:

H1. The rate of return to education is rising with the expansion of higher education.

Based on the previous study, the return to education for college graduates are higher than those for lower level of education, called “college premium” (Awaworyi & Vinod, 2018). Thus, with the booming enrollment in higher education, the overall return rate should increase.

H2. The return to education for urban residents is higher than that for rural residents.

Education inequity for students in rural and urban areas has been heat issue for decades, but when more rural students have got the chance to enter higher education, the rural-urban gap should become narrow.

H3. The younger generation who was born between 1980 and 1999 has higher educational return rate than the elder generation who was born between 1960 and 1979.

“Human capital” theory supported that the longer years of education led to higher incomes. The renaissance of China in recent years also demanded high-tech talents. Liu (2015) suggested that senior workers with more working experience even have lower returns to education than younger workers do.

3. Data and Research Method

The data used in this study comes from 2017 Chinese General Social Survey (CGSS). CGSS 2017 is a national data set that was conducted by Chinese academic institutions, and it covers most provincial level divisions in mainland China, except for three of less populated provinces: Hainan, Xinjiang and Tibet. In this analysis, the selected sample of CGSS 2017 is based on respondents

born in 1960–1999 (assumed to be the 1978–2017 higher education admission cohorts) and the individuals whose income is "zero" or "unknown" are deleted. The valid number of sampling is 5043. To compare the effect of higher education expansion, the data is divided into two groups: group 1 (N=3073) includes respondents born in 1960-1979 and group 2 (N=1970) includes that born in 1980-1999.

The basic model we use is the Mincer Model, but we modified it by adding three variables of gender, health and industry to lower the error.

$$LnY=\beta_0+\beta_1 edu+\beta_2 exp+\beta_3 exp^2+ \sigma_1 gender+\sigma_2 health+\sigma_3 industry +\varepsilon \quad (2)$$

Upon this equation, LnY is the log of annual income of each respondent, edu represents the years of education. exp is the years of working experience, but please note that this is an estimated variable as this data is absent in the given survey, and we used the equation of 2016 – birth date – years of education – 6 to give a probable value. Industry refers to the current job that the respondent is currently doing, rural is coded as "0", and non-rural is "1" to detect the influence of current work.

Table 1. The descriptive data of people with different hukou status

Definition of variables	Overall			Rural			Urban		
	overall	Group 1 (1960-1979)	Group 2 (1980-1999)	overall	Group 1 (1960-1979)	Group 2 (1980-1999)	overall	Group 1 (1960-1979)	Group 2 (1980-1999)
Annual Income	52650	45611	64288	38590	33220	48322	75053	67316	86037
Log of income (yuan)	10.24	10.05	10.55	9.93	9.72	10.31	10.74	10.64	10.89
Years of Education (Year)	10.58	9.44	12.48	9.03	7.96	10.98	13.15	12.10	14.62
Work Experience (Year)	23.80	31.56	10.56	25.55	32.99	11.82	20.84	29.00	8.68
Gender (male=1; female=0)	0.51	0.50	0.53	0.52	0.51	0.54	0.49	0.48	0.52
Health (health=1; others=0)	0.88	0.84	0.96	0.86	0.80	0.96	0.93	0.91	0.97
Industry (non-rural=1; rural=0)	0.79	0.71	0.92	0.68	0.57	0.87	0.99	0.98	1.00
Number of Respondents	5043	3073	1970	3174	2041	1133	1852	1020	832

From the descriptive data, a few trends become apparent. Firstly, the amount of annual income of each individual took an upward trend, both in rural and urban areas, while the rural-urban gap between group 1 and group 2 becomes slightly larger, changing from 34096 to 37715. Secondly, there is a stable increase in the years of education for both rural and urban, and urban residents in group 2 took more benefits of universities expansion, with 14.62 years of education in average. Thirdly, the overall healthy condition has made improvement, rising from 0.71 to 0.92, besides the influential factor of age difference in two groups. At last, it's a universal trend that fewer people are engaged in rural work.

4. Results and Findings

This study adopted OLS as the estimator for the calculation, and we kept six variables in this study. β_1 is the calculated return rate. The results for the sampling are listed in the following Table 2.

Table 2. The results of the return to education based on OLS

Variable	Overall			Rural			Urban		
	overall	Group 1 (1960-1979)	Group 2 (1980-1999)	overall	Group 1 (1960-1979)	Group 2 (1980-1999)	overall	Group 1 (1960-1979)	Group 2 (1980-1999)
Edu	0.094** (24.065)	0.078** (14.436)	0.130** (18.571)	0.067** (12.393)	0.048** (6.636)	0.120** (11.946)	0.113** (16.985)	0.111** (12.050)	0.129** (10.637)
Exp	0.017** (4.330)	-0.081** (-5.386)	0.058** (5.851)	0.012* (2.343)	-0.116** (-5.347)	0.067** (5.256)	0.024** (3.865)	-0.022 (-0.856)	0.040* (2.386)

Exp2	-0.000** (-4.657)	0.001** (4.657)	-0.001** (-2.993)	-0.000** (-3.206)	0.002** (4.649)	-0.002** (-3.240)	-0.001** (-3.611)	0.000 (0.697)	-0.001 (-0.734)
Gender	0.319** (13.179)	0.341** (10.579)	0.319** (8.846)	0.373** (11.758)	0.433** (10.449)	0.332** (6.875)	0.272** (7.495)	0.222** (4.481)	0.317** (5.952)
Health	0.369** (8.551)	0.427** (8.868)	0.042 (0.401)	0.420** (8.383)	0.442** (8.003)	0.149 (1.140)	0.192* (2.200)	0.320** (3.143)	-0.147 (-0.867)
Industry	0.979** (28.286)	1.034** (25.889)	0.804** (11.220)	0.970** (25.259)	1.005** (22.444)	0.783** (10.434)	0.483** (2.804)	0.500** (2.588)	0.440 (1.139)
N	5043	3073	1970	3174	2041	1133	1852	1020	832
R^2	0.443	0.466	0.314	0.414	0.416	0.296	0.23	0.247	0.198

NOTE: the number is the parentheses is the standard deviation; significant level: $p<0.05$ is symbolled as *; $p<0.01$ is symbolled as **.

Based on the analyzed information, it shows that the return rate of group 2 (who were born between 1980-1999), at 13% is much higher than that of group 1 (who were born between 1960-1979), at 7.8%. With the contrast between two groups, it strongly supported the hypothesis 1 (H1) and proved that the expansion of higher education brings significant increase in the individual income.

Meanwhile, the overall rate of return to education in rural was 6.7%, and its counterpart in urban area is 11.3%, which supported the assertion of rural-urban educational inequity. If we contrast two groups, it is found that the gap was actually narrowing. For group 1, the return rate to education for rural was 4.8%, while the urban one is 11.1%; nonetheless, for group 2, the return rate to education increased in 12%, while the urban on is 12.9%, although there was still a gap of 2.52 years of education difference for rural and urban residents. The results also exhibited a remarkable difference of the influential factors to individual income for rural and urban clusters. The R_2 for overall rural respondents is 0.414, which is substantially higher than that of urban one ($R_2 = 0.23$). Hence, it is possible that the income of urban individuals might be impacted more by other reasons like family background or personal talent.

5. Conclusion and Further Research

In conclusion, this paper focuses on the changes of returns to education with the expansion of Chinese higher education. As the previous studies demonstrated, there is positive correlation between the years of education and the return rate based on the modified Mincer's Model with OLS regression analysis. However, the data also inspired more thoughts on the current escalating higher education.

Firstly, there was no obvious overall increase for the return of education compared to the previous study. The general data of return rate in recent study fluctuated around 9% (Hu & Hibel, 2015) (Wang & Wu, 2018). In this study, the overall figure was 9.4%, which was congruent with most of previous study. The result bolstered that the overall swelling of educational years does not necessarily result in higher income. From the social economics, the cumulative knowledge and skills does not bring in more employment opportunities or improvement in social status. On the contrary, the expansion of higher education lowered the signal effect of education. Liu (2018) asserts that the widespread graduates with lower quality decreased the overall salary of graduates from ordinary universities, and diploma has no longer been an indicator of students' ability.

Secondly, the comparison of rural-urban residents in group 2 (born during 1980-1999) showed that there was a slight difference between these two cohorts, with 12% and 12.9% respectively. However, the average annual income of rural and urban in group 2 still had an apparent gap with 48322 yuan and 86037 yuan, which possibly supported the theory of social reproduction (Bourdieu, 1986) -- the family background or the social status have more effect on the individual income. In this study, the R_2 for overall rural respondents is 0.414, which was substantially higher than that of urban one ($R_2 = 0.23$), which further reinforced that there were more influential factors for urban residents in their income. Hence, more research involves personal capability, socioeconomic status, and family background should be done to detect the potential factors.

Thirdly, the expansion of higher education is not normally distributed for rural-urban students. It could be seen that the average year of education in rural areas for group 2 was 10.98 years, while that of urban ones was 14.62 years, which means the latest expansion mostly benefited students in urban areas. Furthermore, it should also be noted that for group 2, more rural residents are engaged in the non-rural industry, but their income compared to the urban ones are still much lower. It is highly possible that as they do not have diploma, they have to do some labor-work like express delivering or taxi drivers, and other occupations that have lower requirement on education certificates. Thus, educationalists and policy makers should consider more about enrolling more rural students in college education, through providing more financial support and privileged admission policy.

Overall, when public cheer for China across the threshold of universal education, it is of necessity to be wary about the side effects of widening social inequalities and the need to take actions to alleviate education inequity. The aggravative education hierarchy, the trapped mindset of families and the education inflation fail to protect the “weak” in the long term. Therefore, the author provides following suggestions for policy makers.

To start with, the government should place emphasis on improving the overall quality of higher education to downgrade educational stratifications, allowing transferring systems in different universities and liberating private institutions. Instead of unceasingly rise of college-students enrollment, government should carry out credential, assessment, and supervision policy to control the teaching quality in universities. Different from “efficient” increasing quota to rural students, the more sustainable approach might be the cooperation between top universities and normal ones, by building a transferring system. Because offering lower admission requirement of “985, 211” for rural students could not patch up their weakness in secondary education, but causing more difficulty in following up the courses and even psychological problems (Wang et al., 2017). Instead, the transferring system improves the teaching quality of normal universities, and offers more chances for getting a high-quality diploma. Moreover, private institutions, making up 28% of Chinese higher education, should get more freedom in raising money, setting programs and enlarging their scales, allowing market competition to select high-quality ones.

Next, instead of continuing expanding the number and scale of universities, more national grants should be invested in the primary and secondary education in rural areas, especially to attract more qualified teachers in remote areas. Secondary schooling is an essential period for teenagers to trigger their interest and think over their outlook on life. A qualified tutor in high school helps rural students to understand the meaning of education and for it to be developed in a comprehensive way. Hence, government should distribute grants to advocate better teachers and even college graduates to go to rural areas to improve the fundamental education and influence the traditional mindset of local parents.

Finally, in order to alleviate current education inflation, government should encourage pluralistic development among universities and adjust the imbalanced supply-demand in education. Paradoxically, different from surfeit supply in senior skilled workers, the labor-intensive enterprises and high-tech industries in China are still in high demand of labor force (Liu, 2018). Thus, instead of using the same benchmark to evaluate the universities, the government should encourage the applied science institutions, enterprise-sponsored programs and special grant for agricultural and husbandry programs. In this way, rural students who graduate from less prestigious colleges could possibly engage back in agriculture or labor-intensive work without conspicuous social bias. Another advice is for the regulation of recruitment in different fields. The enterprise would not randomly increase their recruitment standard if the government has regulations about the consistency between diploma and the job, and the blind pursuit of diploma might be constrained when high school graduates would find a satisfied job. Rather than providing an instant anesthetic, persistent nutrition would be healthier.

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