Returns to Education in Rural and Urban China: An Empirical Study

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Abstract

This paper focuses on the returns to education in China, and it aims to determine the returns rate difference between those in the rural and urban areas. Mincer's model has been used as the base for the returns rate calculation. OLS has been chosen as the estimator for the regression analysis. The data set selected for analyzing was CHIP 2013, which is one of the latest national level education and income surveys conducted in China. The empirical analysis results showed that the rate of returns to education for the general samples was 13.9%. This, therefore, was higher than the rate (around 10%) in 2000-2010 in China. Meanwhile, the significant difference between rural (3.7%) and urban (25.6%) areas has been detected. The gender equality testing showed that in rural areas, the rate of returns to education for females (9.1%) was much higher than males (2.5%). The results provided an overview of the current situation regarding the educational investment in China. It also pointed out the income and educational inequality between rural-urban and male-female.

Keywords: returns to education, Mincer's model, regression, rural-urban inequality

1. Introduction

1.1 Research Background

After China's reform and opening-up, China started its economic development in the real sense. In the past ten years, China has experienced an extremely high-speed development economic growth. Currently, China has become the second largest economy in the world, which ranked only second to the United States. In the meanwhile, some important indicators of residents' living quality, for instance, wages, non-wage incomes, assets, literacy rate, and quality of education has also sharply increased along with the high-speed economic development. This paper will focus on the improvement of Chinese residents' living quality, especially in terms of education and income. Returns to education, a significant indicator which measures the value of education and the connection between education and labor market, will be analyzed in the Chinese context.

Returns to education are "calculated for investments undertaken as a part of initial education, and account for the main costs and benefits associated with this investment decision" (OECD, 2009, p.152). It can also be described as the increase in the income from an additional year of education for an individual who makes the investment decision on education (Borjas & Van Ours, 2010). Educational investment is one of the most important investment decisions in most of the families in China or most countries around the world. Returns to education are an indicator that is used to estimate the value of education. In addition, the estimation is also possible to testify of the different value of education between different educational level (e.g. elementary, secondary or higher education), different regions (e.g. different countries, see OECD, 2009; rural and urban, see Duraisamy, 2002; Zhang et al., 2015), etc.

Even China, as mentioned, has already become the second largest economy in the world. However, it is still a developing country. In the micro perspective, for the single persons or families, the per capita disposable income in China is not very high when compared with the developed countries. Base on the statistic from the National Statistics Bureau, the per capita disposable income in China in 2016 was 33,616 Yuan a year. Thus, for an ordinary Chinese family, there is no much financial resource for doing investment. Therefore, returns to education are an important factor people need to consider before investing in education. In the macro perspective, China is also facing some problems regarding education at the national level. For instance, some researches pointed out that the educational quality in urban and rural areas is unbalanced (see Bao, 2006; Zhang, 2003). Also, the analysis of returns to education could be helpful in determining the gap between the quality of

education in urban and rural areas. Moreover, the education in China has also been criticized to be the poor connection of the theory with practice (Dello-Iacovo, 2009; Walker & Qian, 2012). The Chinese school education was not able to provide students with the necessary skills and abilities required in their future career (Hawkins, 2000). Thus, China started an education reform to solve this issue, which was named as "quality education" in 1999 (Dello-Iacovo, 2009). Returns to education also can be seen as an indicator for the connection of school education and labor market. The research of returns to education could be valuable for analyzing the effectiveness and progress of the Chinese education reform and its contribution to the policymaker.

1.2 Literature Review

1.2.1 Rural-Urban Inequality

Rural-urban inequality is one of the major problems which China is facing in the current development, and it will be one of the main focuses of this study. The rural-urban inequality reflects on both education and the labor market. Thus, this paper aims to discuss this topic via the returns to education analysis.

One of the most important problems which lead to rural-urban inequality was the household registration system (named as "hukou"), which was issued by the Chinese government in 1955 (Wu, 2011). At the first beginning, the hukou system was being issued to control rapid industrialization (Chan, 1994). Every household must perform the registration at the local household registration and management department. However, if the people or households want to move permanently to another place (no matter the cities or villages), they must first write an application to the relevant department. The households in the hukou system are categorized as "agricultural" or "non-agricultural" (or refer to "rural" and "urban"). Furthermore, the "agricultural" and "non-agricultural" householders have different rights in permanent employment, housing, health insurance, pensions, and children's educational opportunities, etc. (Wu, 2011). Even China has started to reform the hukou system (Wang, 2004). Nevertheless, the barriers still exist and remain hard to be completely removed (Sicular et al., 2007).

In the nine years compulsory education (six years of elementary school education plus three years of junior middle school education), students are required to attend the schools which is close to their place of residence. Thus, students' place of residence is based on their registration in Hukou system. For instance, in most of regions, students who are from villages and are registered as "agricultural" in Hukou system are not allowed to receive education in schools in urban areas (Zhang & Kanbur, 2005). However, the educational quality in urban and rural areas has a large gap. Education in rural areas are facing a great number of huge problems, e.g. lack of materials and funding, lack of teachers, teachers' teaching quality is relatively low, lack of health facilities, etc. (Luo & Mkandawire, 2015; Zhang & Kanbur, 2005). The lower educational quality in the first nine years makes it difficult for students from rural areas to gain better scores compared to students from urban areas in the senior middle school and/or college entrance examinations. As a result, this makes it difficult for them to gain admission into good schools and universities (Lillebrohus, 2014).

The labor markets in rural and urban areas are also not equal in China. Based on the statistic by National Bureau of Statistic of China in 2016, the per capita disposable income of urban residents was 33,616 Yuan. Thus, this is almost three times the rural residents (12,363 Yuan). The differences occurs due to multiple reasons (see Carter, 1997; Hertel & Zhai, 2006), but they are not the main focus of this study. However, the significant income and education quality gap could lead to the obvious difference regarding the returns to education between the rural and urban areas. Therefore, the following sections will perform an analysis and discussion about it.

1.2.2 Human Capital Theory and Mincer's Model

The human capital theory has been widely used in the returns to education researches. The theory was created by Jacob Mince in 1974. The human capital theory assumes that labor income is a function of training/education and experience (Mince, 1974). The theory is also known as human capital earnings function or Mincerian earnings function (Duraisamy, 2002). According to human capital theory, education increases productivity; the higher the productivity the higher the wages. Education is seen as an investment, same as other financial investments, and whether people invest in human capital depends on whether the investment is profitable, which depends on the cost and expected returns (Gillies, 2017)

Mincer's model (Mincer, 1974) is the core of the human capital theory, which could be used to calculate the returns to education. The equation is as follows:

$$LnY_i = \beta_0 + \beta_1 edu_i + \beta_2 exp_i + u_i \tag{1}$$

In this equation (1), Y_i is the income of individual i. In the ideal situation, it should be an hourly wage but not monthly or yearly wage because people's working hour varies. edu_i is years of education of individual i, while exp_i is years of work experience. U_i has been set as an independently and normally distributed error terms (e.g.

location, tax policies etc.). (Cui, Nahm, & Tani, 2013) The human capital theory claims that wages are determined by investment in human capital, and school education and job training are the main types of investment. In this case, the work experience could be seen as the representative for job-training investment. In the equation, β_1 represents the returns to school education for an individual, and β_2 represents the returns to job experience for an individual.

1.2.3 Review of Previous Studies

There were some previous studies focused on the returns to education in China. The previous studies illustrated an overall increasing trend for the returns to education in China in the past decades. Since the studies were based on the different data source and considered various factors, the results were varied. Nevertheless, most of the studies have achieved results in basically same range, which provided us with the possibility to have a general overview of the previous studies.

In the 1980s, the returns to education in China were very low (Maurer-Fazio, 1999; Liu, 1998; Knight & Song, 2003). Studies also pointed out that the average returns rate in 1980s was lower than 4.0% (Awaworyi & Mishra, 2014). To be more specific, Meng and Kidd (1997)'s research found out the returns rate at 2.5% and 2.7% for the year 1981 and 1987. In addition, according to Byron and Manaloto's (1990) study, an extra year of school education in the 1980s could have 3.7 % returns rate.

In the 1990s, the returns to education were growing significantly (Heckman & Li, 2004; Li, 2003). For instance, the research conducted by Knight and Song (2003) showed that the returns rate in 1995 has jumped to 40.1%, which is extremely higher than the returns rate in the 80s. However, because this figure was far higher than the expected range, here we assumed this study used some methods different from the others (e.g. excluded the constant in the regression equation). Meanwhile, there were different studies that showed different results and figures. Zhang et al. (2005) have analyzed the returns to education from 1988 to the end of the 20th century, and the numbers grew from 4.7% to 11.5%. Considering the fact that the world average returns rate was 10.1% and the Asian average returns rate was around 9.6% in the early 1990s (Psacharopoulos, 1994), the result from Zhang et al. (2005) would be much more reliable.

After we entered the 21st century, the rate of returns to education seems to stop the growth trend. In most of the studies, the rate of returns to education was maintained around 10%. For instance, Hu et al. (2014) claimed that the returns rate in 2006 was around 9.96%; and Zhou et al. (2010) reported the returns rate in 2008 was around 9.00%. The results could raise a question as to whether the returns to education in China have stopped growing in the recent decade. However, since there were not enough studies that focuses on the returns to education after 2010, this question is hard to be answered if we only base it on literature review.

In addition, as another focus of this study, the inequality for urban and rural was not commonly associated with the previous studies. Consequently, a few studies have emphasized this concern. Zhang (2012) had made a comparison study between urban and rural areas regarding the returns to education base on the data from 2002. Additionally, he found out that the returns rate for urban areas was 9.37%, which is significantly higher than that in the rural areas (6.28%). However, there was barely any study which could provide information about the urban-rural difference in the recent years (after 2010). As a result, it is necessary to conduct a study to fill in this gap.

To sum up, the previous studies have proved that the returns to education kept increasing from the 1980s to 2000s. However, the growth slowed down or stopped after entry into the 21st century. Moreover, currently, there were not enough studies that could provide an overview of the situation after 2010, especially the urban-rural difference. Thus, the review of previous studies gave an overview of the general development of returns to education in the past four decades. Furthermore, it also highlights the possibility and importance to conduct a study which focuses on the returns to education, after 2010, and the urban-rural difference.

1.2.4 Research Questions and Hypotheses

This study aims to answer the following questions:

Q1. What is the rate of returns to education in China after 2010?

Q2. Is there a difference between urban and rural areas regarding the returns to education?

Two hypotheses which were relevant to these two research questions have been created before the analysis. In the current stage, we assume:

H1. The returns to education in China after 2010 was higher than before

In the previous part we have introduced, China is experiencing a high-speed economic growth. However, the

wage for the workforces also got a significant increase along with the economic growth in recent years. Moreover, the quality of education, especially higher education in China, was also enhancing. Thus, we assumed that the returns to education in China also got an obvious enhancement.

H2. The returns to education in urban areas is higher than rural areas

In the previous parts, we analyzed the inequality between urban and rural areas regarding education and the labor market. The urban residents achieved obvious advantages in these two aspects compared to the rural residents. There were also some studies which pointed out that there was a gap between the returns to education in urban and rural areas before 2010. Currently, the inequality has the trend to be extensive. Currently, we assume that the gap between urban and rural areas regarding the returns to education still exists. Hence, the returns rate for urban areas should be higher than rural areas.

2. Method

2.1 Data

Basically, there are four national surveys used as a data source. The first one is the Chinese Household Income Project (CHIP) which was conducted by China Institute For Income Distribution in Beijing Normal University. The second one is the Chinese Health and Nutrition Survey (CHNS) which was conducted by Carolina Population Center at the University of North Carolina at Chapel Hill and the National Institute for Nutrition and Health at the Chinese Center for Disease Control and Prevention. The third one is the Chinese General Social Survey (CGSS) which was conducted by the academic institution in China. Finally, the fourth one is Urban Household Survey which was conducted by the National Bureau of Statistics (NBS).

In this study, the Chinese Household Income Project (CHIP) will be used. This database contains detailed data for the income distribution in China. In addition, it has a clear classification (urban-rural) for the data. Therefore, this data set is suitable to be considered as the basis for this study. CHIP has conducted five times of household surveys in 1989, 1996, 2003, 2008, and 2013.

In order to perform the analysis for the returns to education after 2010, the data from CHIP 2013 will be used for analysis. The CHIP 2013 was conducted in July and August 2014 and it is focused on the Chinese residents' income distribution and expenditure situation in 2013 (China Institute For Income Distribution, 2016). The CHIP 2013 was supported by the National Natural Science Fund and National Bureau of Statistics, and was organized and conducted by China Institute for Income Distribution in Beijing Normal University (China Institute For Income Distribution, 2016).

The sample of CHIP 2013 contains 160 thousands households. The sampling covered basically all the areas in China (East, Center and West parts), which include 15 provinces, 126 cities, 234 villages, 18,948 households, and 64,777 individuals. Besides, the sample contains 7,175 urban households (around 38%), 11,013 rural households (around 58%), and 760 migrant households (around 4%) (China Institute For Income Distribution, 2016). Since the migrant households only take a little proportion of the total and their background is complex, the analysis in this study will only focus on the urban and rural households.

CHIP 2013 provided the wage information as an annual earning. However, as mentioned in the previous part, the analysis and calculation of returns to education should be based on the hourly wage. Fortunately, CHIP 2013 also provided the information about participants' working hour. Therefore, this means it is possible to get the data hourly wage by calculation.

2.2 Analysis Model and Methods

Mincer's model will be used in the empirical study to calculate the rate of returns to education. Moreover, the returns rate differences occur between rural-urban. Also, male-female will be discussed. Thus, it draws an outline of the connections between education and the labor market in China, and it discovers how the social/educational factors influenced one's income level.

Basically, two different methods can be used in the comparison of returns rates between different groups. The first method divide the samples into different groups, then calculate and analyze the returns rates separately (e.g. Zhang et al., 2005). The second method adds the grouping variables into the regression model (e.g. Dougherty, 2005). In this study, the first method will be used because it can provide a much clearer statement of the returns rate in every single group, which would be helpful to reach the research aims in this study.

In addition, some variables have been proved to have effects on income level, such as marriage status (Patterson, Kupersmidt, & Vaden, 1990), race (Reich, 2017), health situation (Pickett & Wilkinson, 2015), and political status (Wang, Pan, & Luo, 2015). However, these variables are not going to be discussed in this study since they

are not relevant with our main research focuses. Therefore, these variables are added to the model as the controlled variables. The final model used in the empirical study is model (2), which also can be summarized as (3)

$$LnY_i=\beta_0+\beta_1edu_i+\beta_2exp_i+ \sigma_1marriage+ \sigma_2race+ \sigma_3health+ \sigma_4political+u_i \qquad (2)$$

$$LnY_i=\beta_0+\beta_1edu_i+\beta_2exp_i+\sigma(controlled\ variables_i)+u_i \qquad (3)$$

Within the model, β_1 is the returns rate for education while β_2 is the returns rate for work experience. u_i stands for the disturbance terms.

The estimation procedure, which is going to be used in this analysis, is the ordinary least squares (OLS) (Dismuke & Lindrooth, 2006). Furthermore, it has also been considered as one of the most commonly used methods in the returns to education analysis (Li, 2003; Moretti, 2004). Constants will be taken into account in the OLS regression models but it would not be analyzed in the discussion. The analysis will be run by IBM SPSS Statistic. The comparison regarding the rate of returns to education will be conducted between different groups (rural-urban and male-female). Also, the results will be used to discuss how the social background can influence the rate of returns to education.

3. Results and Discussions

3.1 Descriptive Statistics

As introduced above, the CHIP 2013 dataset contained 7,175 urban households and 11,013 rural households. To be more specific, the sample for the data set was drawn from 19,887 individuals from the urban areas and 39,065 individuals from the rural areas. However, the samples for the questionnaire comprises of a certain amount of participants who were not attending work (e.g. students and retired people). Hence, they are not part of the group this research is focusing on. Thus, in this case, only participants who provided the answer to the survey question: "Your employment/study situation at the end of 2013" as "Employed" were taken into account for further analysis.

After the data filtering and cleaning, the sample size decreased to 22,259 individuals (57.6% males, 42.4% females) for rural samples and 9,878 individuals for the urban samples (56.2% males, 43.8% females).

In the question "Highest level of education completed", the questionnaire listed the following options: 1. Never schooled (including informal education such as literacy courses); 2. Elementary school; 3. Junior middle school; 4. Senior middle school; 5. Vocational senior secondary school/technical school; 6. Specialized secondary school; 7. Polytechnic college; 8. Undergraduate (Bachelor's degree) and 9. Graduate (Master's degree or above).

Therefore, the distribution of the participants' educational level in the rural and urban areas are listed in Table 1, and it is also shown in the line chart in Figure 1.

Table 1. Distribution for the participants' educational level

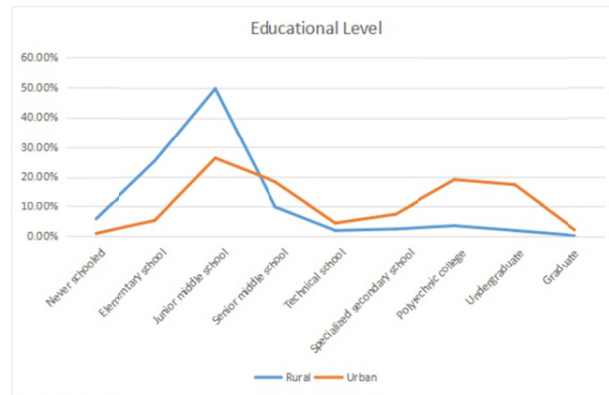| Educational Level	Rural		Urban	
	N	Percentage	N	Percentage
1	1,244	5.6%	72	0.7%
2	5,630	25.3%	512	5.2%
3	11,087	49.8%	2,584	26.2%
4	2,180	9.8%	1,802	18.2%
5	411	1.8%	420	4.3%
6	513	2.3%	719	7.3%
7	755	3.4%	1,866	18.9%
8	401	1.8%	1,698	17.2%
9	17	0.1%	204	2.1%

Figure 1. Participants' educational level in rural and urban areas

From Table 1 and Figure 1, it can be seen that, for the rural participants, their educational level was mainly concentrated on the foundation education duration (elementary, junior middle and senior middle schools). Around half of the rural participants only finished the junior middle school education, which means they decided not to continue their education after their nine years compulsory education. Also, there were only 5.3% participants that were given admission into higher education (polytechnic, college, or university). In comparison, the urban participants had a much higher percentage in regards to receiving higher education (38.2%).

Table 2 and Figure 2 showed the hourly wage for rural and urban participants with different educational levels.

Table 2. Participants' hourly wage

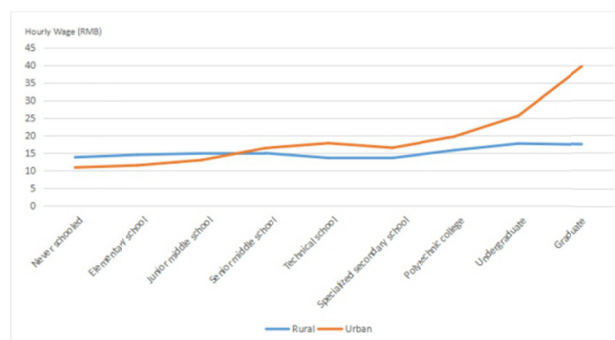| Educational Level	Hourly Wage (RMB)	
	M/SD (Rural)	M/SD (Urban)
1	13.9/1.1	11.0/12.7
2	14.6/15.0	11.6/11.9
3	15.0/17.5	13.1/12.5
4	15.1/20.6	16.5/16.1
5	13.7/11.0	17.9/34.5
6	13.7/10.4	16.6/13.8
7	15.9/13.5	19.8/14.2
8	17.8/10.2	25.7/22.7
9	17.5/10.7	39.6/35.2

Figure 2. Participants' income level in rural and urban areas

The income-inequality between rural and urban exists in many countries, including China (De Brauw & Giles, 2018; Sicular, Ximing, Gustafsson, & Shi, 2007). Based on the data from CHIP 2013 (see Table 2; Figure 2), most of the urban residents had higher hourly wage than rural residents. Furthermore, an analysis (independent t-test) regarding the income difference in the rural and urban areas has been conducted in this study. The results showed that a statistically significant difference can be detected between urban and rural residents' income level (t=13.25, p<.01). This means, in general, that the urban residents' income was much higher than that of the rural residents.

3.2 Analysis of Returns to Education

3.2.1 General Analysis for the Returns to Education in China

In this section, the returns to education would be calculated and analyzed. As introduced previously, OLS will be selected as the estimator for the calculation.

$$LnY_i = \beta_0 + \beta_1 edu_i + \beta_2 exp_i + \sigma(controlled\ variables_i) + u_i \qquad (3)$$

In addition, model has been used to calculate the returns rate. The results for the general samples have been listed in Table 3.

Table 3. The rate of returns to education - general group

		Education	Work Experience
General	β	0.139***	0.084***
Group	(SE)	(0.036)	(0.014)
Model Fits: $R^2 = 0.20$	F=167.48***		

***Significant at the 0.001 level.

Based on the analysis, the rate of returns to education in the year 2013 was 13.9%. Meanwhile, the rate of returns to work experience was 8.4%. According to the literature review, during the first decade in the 21st century (2001-2010), the rate of returns to education in China was maintained at around 10%. Thus, it can be said that after 2010, the rate of returns to education was growing with the rapid economic development and educational quality enhancement in China. Therefore, hypothesis one (H1) has been proved.

Psacharopoulos and Patrinos (2018) have analyzed the rate of returns to education worldwide based on Mincer's model. Even the different analysis methods and samples could lead to different results. Yet, we can do a simple comparison and achieve a preliminary impression.

The results obtained from Psacharopoulos and Patrinos (2018) were listed in Table 4. Since it was barely possible to achieve the latest data from each country or regions for the purpose of analysis, the results from Psacharopoulos and Patrinos (2018) were approximately describing the situation in the 2010s. Thus, this would fit into the target time duration of this study.

Table 4. Returns to education by region (Psacharopoulos & Patrinos, 2018)

Region	Overall Rate of Returns (%)
Latin America and Caribbean	11.0
Sub-Saharan Africa	10.5
East Asia and Pacific	8.7
South Asia	8.1
Europe and Central Asia	7.3
Middle East and North Africa	5.7
World Average	8.8

Based on the results obtained from Psacharopoulos and Patrinos (2018), the world average rate of returns to

education was 8.8%, which was basically close to the level in China in the 2000s. Currently, the rate of returns to education in China has gone beyond the world average level and the East Asia and Pacific average level (8.7%). The Latin America and the Caribbean had the highest level of returns to education which was 11.0%. Due to the fact that the analysis and sampling methods in Psacharopoulos and Patrinos's (2018) research was not completely clear, it is not precise to make the judgment that the Chinese returns to education rate was higher than Latin America and Caribbean. Nevertheless, at least a basic statement we can make at this stage is that the returns of education in China were comparatively high in the world context.

3.2.2 Returns to Education in Rural and Urban Areas

The rates of returns to education for rural and urban areas were calculated and listed in Table 5.

Table 5. Rates of returns to education - rural and urban

		Education	Work Experience
Rural	β	0.037***	0.080***
	(SE)	(0.051)	(0.020)
Model Fits: R^2 = 0.11	F=28.57***		
Urban	β	0.256***	0.105***
	(SE)	(0.055)	(0.018)
Model Fits: R^2 = 0.29	F=151.63***		

***Significant at the 0.001 level.

The rate of returns to education in rural was 3.7%, which was significantly lower than the rate in urban 25.6%. There was a huge gap between these two numbers, which indicated the extreme difference between rural and urban education and the labor market. The literature review part has introduced some previous studies which have already proved that there was a significant difference between the rate of returns to education in rural and urban in the early 2000s (Zhang, 2012). Nevertheless, the current results indicated that the gap was sharply growing in the past decade. The reason could be the extending economic and educational inequality (Xie & Zhou, 2014; Zhang, Li & Xue, 2015). The results also strongly supported hypothesis 2 (H2).

Meanwhile, in the rural areas, the returns to work experience (8%) were higher than education. In the opposite, the returns to work experience (10.5%) in the urban areas were significantly lower than education. The results stated that work experience was more important than education for the rural labors. For the urban labors, education was the key factor which influenced their income level.

3.2.3 Returns to Education for Males and Females

Males and females difference in the level of returns to education is an indicator to measure the gender equality in education and the labor market. Table 6-1 and 6-2 showed the rate of returns to education for males and females in rural and urban areas respectively.

Table 6-1. Rates of returns to education by gender - rural

		Education	Work Experience
Male	β	0.025*	0.065***
	(SE)	(0.076)	(0.026)
Model Fits: R^2 = 0.10	F=17.92***		
Female	β	0.091***	0.066***
	(SE)	(0.063)	(0.030)
Model Fits: R^2 = 0.11	F=10.73***		

*Significant at the 0.05 level.

***Significant at the 0.001 level.

Table 6-2. Rates of returns to education by gender - urban

		Education	Work Experience
Male	β	0.277***	0.091***
	(SE)	(0.079)	(0.024)
Model Fits: R^2 = 0.30	F=93.10***		
Female	β	0.246***	0.095***
	(SE)	(0.088)	(0.032)
Model Fits: R^2 = 0.27	F=162.20***		

***Significant at the 0.001 level.

In rural areas, the rate of returns to education for females (9.1%) was much higher than males (2.5%). This results show that in the rural areas, females' income much more relied on their educational level. On the other hand, for the males, their educational level was a non-essential factor in influencing their income.

The rates of returns to education in urban areas were significantly higher than rural areas. This is expected to be so, especially considering the huge gap regarding the returns rate gap indicated above. For the gender differences, the situation in urban areas showed the opposite tendency with rural areas. Urban males showed a higher returns rate (27.7%) than females (24.6%). However, the gap was much smaller than rural areas.

Males and females' returns to work experience were close in both the rural and urban samples. Thus, the educational level should be one of the important factors which caused the significant income inequality detected between males and females in both rural (t=16.32, p<0.001; males had higher income) and urban (t=11.12, p<0.001; males had higher income). To be more specific, as discussed, the rural females' income level was much more influenced by their educational level; however, the t-test actually showed that the rural females' years of education was significantly lower than males' (t=16.18, p<0.001). Therefore, it is not hard to understand why the rural females' income level was significantly lower than males. For the urban residents, even males and females did not have a significant difference regarding years of education (p>0.05), but the higher rate of returns to education can still help urban males achieve higher income than urban females. In general, the gender inequality in education and labor market exists in China, and this problem is more serious in the rural areas.

4. Conclusion

In conclusion, this paper focuses on the returns to education in China, and on the returns rate difference between rural and urban areas. As the previous studies reported, the rate of returns to education was growing in the 1990s, but it maintained around 10% at the first decade in the 21st century (2000-2010). Additionally, there was a significant difference between rural and urban areas. However, there was not enough study that focuses on the educational returns rate after 2010. Thus, this study aims to contribute in this area.

OLS regression empirical analysis results showed that the rate of returns to education for the general samples was 13.9% (p<.001; regression model fits: R^2 = 0.20 F=167.48, p<.001). Hence, this was higher than the rate (~10%) in 2000-2010 in China. This result proved the first hypothesis we made. Meanwhile, the significant difference between rural (3.7%) and urban (25.6%) still existed and even extended, and this finding also supported the second hypothesis.

The gender equality testing showed that in rural areas, the rate of returns to education for females (9.1%) was much higher than males (2.5%). In the urban areas, the returns rate for males was slightly higher than females. However, even education had a much valuable meaning for the rural females, and rural males still had significant longer time of education. Thus, the income inequality between rural males and females was inevitable.

Returns to education is an effective indicator for researchers and policy makers to understand the changing role of education. In general, the study found the rate of returns to education after 2010 started to increase in China, which strongly indicating the value of education was increasing. However, the inequalities between rural-urban and male-female (especially in the rural areas) could be detected. How to achieve a higher rate of returns to education, and eliminate the inequalities between rural-urban and male-female should be considered in the policy-making process. To sum up, this study provided an overview of the current situation regarding the educational investment in China, which could be the basis for further analysis.

5. Recommendations

The problems and issues detected in this study were mainly concentrated with the rural areas. Firstly, the rural areas showed a significantly lower level than the urban areas at both educational and income level. The result confirmed that the development of inequalities, which was discussed in some previous studies, indeed existed between rural and urban areas in China. As Wolf (2002) stated, education actually is one of the key factors which can support the development. However, the low rate of returns to education in the rural areas will inevitably damage the enthusiasm for doing educational investment for the rural families and individuals. This situation might result to a decrease in the educational level of the rural workforce. Obviously, it would have a negative impact on its economic development.

Therefore, this study suggests that the inequality between rural and urban areas, regarding returns to education, should be paid attention. Some possible solutions could include intensify the industrial restructuring and strive to develop tertiary industry in rural areas; promote economic development especially for less developed areas such as the middle and west region of China; and improve and develop the educational system which is always an essential work to do in the modern age. Moreover, some other issues detected in this study such as the gender inequality in the rural area should also be highlighted. Corresponding policies or strategies should be issued by the government to address the problems that were discussed.

6. Limitations

There were some limitations in this study. Firstly, even the dataset CHIP 2013 which was one of the latest national-level surveys is still a bit "out of date". Between 2013-2018, China had achieved great development. Due to the huge amount of data needed to be processed, the results of CHIP 2013 were published in 2016, which was three years later after the data collection. At the current stage, apart from CHIP 2013, there was no available data set which focuses on the Chinese citizens' educational and income information during 2013-2018. Therefore, this drawback was hard to overcome. Nevertheless, after the China Institute for Income Distribution conducted the next CHIP survey, there was great possibility to implement a follow-up study.

Moreover, some important features which might impact one's income level (e.g. taxation policy, major of study) were not in the scope of CHIP 2013 survey. Thus, the analyses regarding these features were not available. It, however, suggested conducting further social investigations/survey to fill in this blank.

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