

The analysis of the relation of education investment and urban-rural income gap in YUNNAN Province

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Abstract—Education is a typical process of accumulating human capital, which not only improves the overall quality of rural labor, but also increases income. The income gap between urban and rural residents is closely associated with education investment in Yunnan Province. Through the use of econometric model, the research finds that investment in both education and fixed assets can lead to the widening of urban-rural income gap. Therefore, measures should be taken to ensure equal allocation of financial resources to narrow the income gap caused by education investment and other factors.

Keywords—education investment; urban-rural income gap; causality

I. INTRODUCTION

Education is a typical process of accumulating human capital[1]. It not only improves the overall quality of rural labor, helping them adopt advanced technology in agricultural and non-agricultural production, but also provides a vast of rural labor with various opportunities in ongoing urbanization and industrialization to help them seek their own development path[2]. In recent years, China's rural education improves obviously, but there still exist many problems[3]. Compared with urban education, rural education remains at an absolute disadvantage; rural education expenditure is far behind that of urban areas; the average years of education of rural population are less than that of urban population and the gap is even larger in high-level education. Urban-rural education gap is an important reason of widening urban-rural income gap which is a cruel reality.[4] Education originally is one of the important methods of narrowing gap, but the reality is that urban-rural education gap is increasingly widening. The unequal education resources and education conditions enjoyed by urban and rural population will directly lead to the widening of gap in their knowledge structure, economic status and income in the future. An analysis shows that education opportunities enjoyed by urban and rural labor are unequal because of the constraints of government's public expenditure and household income level. It directly leads to the differences of labor's level of education and further quality between urban and rural areas. The differences affect labor's productivity and are eventually reflected on income disparity[5].

II. URBAN-RURAL INCOME GAP IN YUNNAN PROVINCE

The weighted coefficient of variation is used to measure income gap among different regions. P_j represents the population of region j and p is the total number of population. If the weighted coefficient of variation is bigger, the difference of regional economic development is larger; on the contrary, if the coefficient is smaller, the difference is smaller. The weighted coefficient of variation is suited to measure the relevant income gap with consideration of regional economic gross or the size of population. However, its calculation is complex. As with the variation coefficient, the weighted coefficient of variation measures the average income level of regions and Yunnan Province, without considering the difference among the scope of Yunnan Province or the disparity among different regions. Theoretically, if the average income level of each region tends to be the same, the value of variation coefficient or weighted coefficient of variation will be smaller. But in reality, the change of regional difference is likely to become larger. The paper takes per capita income of each prefecture or city as analyzed variable to calculate the variation coefficient of 16 prefectures or cities that is used to compare discrete level of income of each prefecture or city. Through research, it is found that the income gap between prefectures or cities in Yunnan Province is narrowing and the variation coefficient gradually reduces from 0.4528 in 2001 to 0.3635 in 2010.

TABLE I. VARIATION COEFFICIENT OF URBAN-RURAL INCOME GAP IN YUNNAN PROVINCE

TIME	2001	2002	2003	2004	2005
standard deviation	458303.3	472969.07	495181.34	621323.08	759266.94
average	1495.08	1536.24	1608.29	1770.66	1960.22
variation coefficient	0.4528	0.4477	0.4375	0.4451	0.4445
TIME	2006	2007	2008	2009	2010
standard deviation	849631.4	1038413.41	1326147.55	1524123.3	1892899.06
average	2135.88	2478.38	2904.61	3305.61	3784.54
variation coefficient	0.4316	0.4112	0.3965	0.3735	0.3635

Data sources: adapted from data of Statistical Almanac of Yunnan Province(2002-2011)

III. THEORETICAL MODEL CONSTRUCTION AND QUANTITATIVE ANALYSIS

1) According to human capital theory, econometric model is constructed to analyze the influence of education on urban-rural income gap. Model construction:

$$GAP_{ur} = \alpha + \beta_0 edu_{exp} + \beta_1 fix + \beta_2 edu_{exp} \times fix + \varepsilon_t \quad (1)$$

2) GAP_{ur} represents urban-rural income gap, measured by the ratio of per capita disposable income of urban residents to per capita net income of rural residents. GAP_{ur} represents per capita education expenditure investment; fix is fixed assets investment; the two items are measured by the ratio of financial expenditure on certain aspect to that year's GDP. ε_t is random disturbance term. If estimated coefficients of edu_{exp} and fix are negative, it indicates that the two items are conducive to narrow urban-rural income gap. On the one hand, the interaction item of per capita education expenditure investment and per capita fixed assets investment inspects their relation; on the other hand, it can be used to analyze effect of fixed assets investment on income gap through its effect on human capital level. If estimated coefficient is obviously a positive number, it shows that marginal utility of a variable increases as that of another variable increases.

3) The dataset adopted in the paper is from relevant social and economic data of statistical almanac of Yunnan Province and China from 2001 to 2010, in which fixed assets investment is "fix", total education investment is "edu", urban-rural income gap is "gap", meaning urban-rural disposable income balance.

TABLE II. INCOME AND EDUCATION GAP BETWEEN URBAN AND RURAL RESIDENTS

time	urban per capita disposable income	rural per capita disposable income	total education investment (10,000)	fixed assets (10,000)
2001	6859.60	2366.40	109655.20	37213.49
2002	7702.80	2475.60	120332.70	43499.91
2003	8472.20	2622.20	135822.80	55566.61
2004	9421.60	2936.40	159878.30	70477.40
2005	10493.00	3254.90	184937.40	88773.62
2006	11759.50	3587.00	216314.40	109998.2
2007	13785.80	4140.40	265810.30	137323.94
2008	15780.80	4760.60	314045.40	172828.4
2009	17174.70	5153.20	340902.80	224598.77
2010	19109.40	5919.00	401512.80	251683.77

Data sources: Statistical Almanac of China and Statistical Almanac of Yunnan Province (2001-2012)

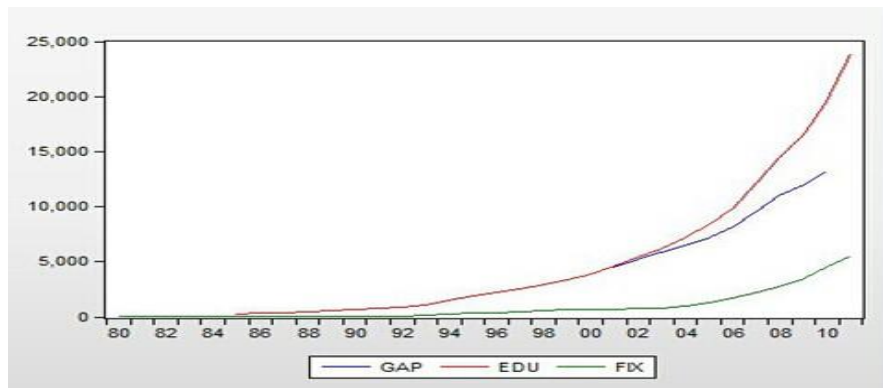


Fig. 1. Measurement simulation

$$\text{GAP}_t = 4647.207 + 22.30308\text{EDU}_t + 4.085263\text{FIX}_t + \epsilon_t \quad (2)$$

The model indicates that the increment of education investment will narrow income gap, but the increment of fixed assets investment will widen income gap.

IV. SUGGESTION AND POLICIES

Education investment and income gap appear in a negative correlation, so the proportion of education expenditure in government expenditure should be raised, especially the proportion of rural education expenditure investment. On the basis of increasing total investment of education expenditure, the growth rate of rural education expenditure investment should be raised and the gap of education expenditure investment between urban and rural areas should be narrowed, especially in the stage of compulsory education.

The relativity about fixed assets investment and income gap is negative, because fixed assets flowing into rural and

urban areas are uneven. Thus, fixed assets investment in rural areas should be increased; the gap of fixed assets investment between urban and rural areas should be narrowed; rural infrastructure, particularly the infrastructure driving economic growth such as road, should be developed; rural investment environment should be improved; the government can make use of tax and other preferential policies to attract capital flowing into rural areas and develop enterprises of townships; we should give play to the advantage of low pay for rural human capital to promote the employment of rural population, make full use of rural human capital, improve rural employment environment and raise rural income.

We should build systematically investment laws and policies of higher education in order to achieve higher education funds investment amount and get a moderate growth, as while as to mobilize government, enterprises pay more attention to the enthusiasm of the education, even their family investing in higher education also. Higher education must build security investment policy which can support by law. On

the basis of the existing “education law”, “higher education act”, our country should enhance and promote the relevant laws and regulations of higher education for the investment. Government, enterprises and educates, even with and their families in the higher education investment enjoying the preferential fiscal and taxation policy etc, as to create a good atmosphere for investment in higher education, and to ensure the steady growth of higher education investment. Allowing higher education bonds being built when conditions are ready, and we could alleviate the government and social investment together.

After China entering the WTO, education ,especially higher education has been opening to the outside world as a service project. Efforts to develop international education market, is not only the inevitable demand for international higher education market competition, we also actively deal with after joining the WTO effective measures for the internationalization of higher education. With the advancement of construction of the china-ASEAN free trade area, Yunnan province’s regional advantage in international education market is becoming bright. Therefore, to make full use of the advantages of geographic location in Yunnan province, drawing lessons from foreign successful experience, the internationalization of higher education would give students the potential to make systematically innovation, while we can develop the international education market as an innovation of higher education investment system, increasing the higher education market, as while as increasing the important means and measures in higher education investment. To encourage universities to advance the internationalization of Yunnan as an ascending important way of running school, and make full use of Yunnan and South Asia countries’ adjacent favorable geographical conditions, and to invest in southeast Asia, South Asia, the construction of China facing southeast Asia and South Asia base for teaching Chinese as a foreign language and personnel training, we should train a

large number of Chinese application-oriented talents, senior management talents and required talents of the china-ASEAN free trade area. In Yunnan province, the government should, in a planned way, construct a batch of high level international talent training base and set up series policies about the surrounding countries, including economy, culture, education and other scientific research institutes. It also needs to strive to building Yunnan into a place which has great influence in China and southeast Asia, South Asia about international talent training and research base.

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