

An Analysis of the Income Elasticity of Education Expenditure of Urban Residents in Hubei Province

Qian Cai^{1,*}, Bing Zhang²

¹College of Education, Huanggang Normal University, Huangzhou, Hubei, China

²Institute of Physical Education, Huanggang Normal University, Huangzhou, Hubei, China

*Corresponding Author

Abstract: With the proposal of prioritizing education development and the first-time positioning of education, technology, and talent as top strategic priorities in China, the country and the people are paying more and more attention to education, and investment in education is increasing. This paper analyzes the per capita disposable income and household education expenditure of urban residents in Hubei Province from 2013 to 2020, calculates the elasticity of household education expenditure to income and its changing trend, and analyzes the sensitivity of changes in household education expenditure to changes in disposable income. It is found that household education expenditure of urban residents is relatively sensitive to changes in disposable income. Based on the actual situation of education investment in Hubei Province. This paper proposes suggestions for promoting rational consumption of education among urban residents in Hubei Province, in order to provide reference for the formulation of relevant education policies.

Keywords: Urban Residents; Per Capita Disposable Income; Household Education Expenditure; Elasticity

1. Introduction

With the continuous development of the Chinese economy, there is an increasing demand for labor, making education, especially family education, a crucial factor in cultivating the workforce. Since ancient times, education has been highly valued in Chinese culture, and Confucianism emphasizes that studying leads to success in official careers. Parents, driven by the desire for upward social mobility, are enthusiastic about investing in family education. Family education investment is an important way for families to secure scarce educational

resources for their children. According to the 2021 New Consumer Survey Report, Chinese parents' expenditure on their children's education has been increasing year by year. Among them, 47.6% of parents spend between 10,000 to 30,000 yuan per year on their children's education, 30.5% spend between 30,000 to 50,000 yuan, and 8.6% spend more than 50,000 yuan [1]. The report also shows that 58.4% of the respondents would choose to enroll their children in various tutoring classes to ensure the quality of their education, while 52.6% of the respondents would choose better schools and educational resources for their children. These data indicate that Chinese families are placing an increasing emphasis on their children's education, and the increase in education expenditure has become an important issue for the country and society. However, excessive investment in family education may lead to an excessive financial burden on families, affecting their quality of life and consumption structure. Therefore, it is of great significance for the government to formulate relevant macro policies to find a balance between family education expenditure and income.

2. Research Trends at Home and Abroad

2.1 Foreign Research Status

Sayed and Al-Othman [2] reviewed the literature to explore the relationship between family socioeconomic status and children's education. They found that family education expenditures and income were closely related to children's education nonattainment. In addition, in families with multiple children, an increase in family income could alleviate the problem of unequal distribution of educational resources among siblings. Checchi [3] examined the relationship between family education expenditures and income in different social classes in Italy and the United Kingdom. They found that education

expenditures were highly elastic relative to family income and the relationship between family education expenditures and income varied across countries, cultures, and social classes. The authors suggested that educational achievement could partially explain income inequality, and the government should help low-income families increase their education investment by providing financial assistance. Nguyen [4] investigated the determinants of family education expenditures in Vietnam, using data from the Vietnam Household Living Standards Survey. The results of their empirical analysis using Probit and OLS regression models showed that family income level was the main factor affecting family education expenditures. Reardon [5] found that the achievement gap between children from wealthy and poor families in the United States was widening, mainly because wealthy families placed more emphasis on their children's education and provided better educational resources. Reardon also explored the differences in academic performance between low-income and high-income students, providing possible explanations and reasons. Nguyen, H. T. [6] investigated the determinants of household education expenditure in Vietnam. The author used data from the Vietnam Household Living Standards Survey and conducted empirical analysis using Probit and OLS regression models. The results showed that household income level is the main factor affecting household education expenditure. Overall, various studies indicate a positive correlation between household income and children's educational outcomes.

2.2 Domestic Research Status

Xing Xin et al. [7] conducted an empirical study on household education expenditure in Beijing and found a positive correlation between family income and education expenditure. Moreover, the proportion of education expenditure in household consumption expenditure gradually increases with the increase in income. Chen Qiong et al. [8] conducted a survey on rural households in Chongqing and found a significant positive correlation between family income level and education expenditure. However, as income increases, the burden of education expenditure on household finances does not significantly decrease. Ma Li et al. [9] conducted a study on the education expenditure

of urban and rural residents in China and found that the proportion of education expenditure in household consumption gradually increases with the increase in income, but there are significant differences in education expenditure among different regions and income groups. Liu Lu et al. [10] conducted an empirical study on rural household education expenditure in Sichuan province and found that the proportion of education expenditure in household consumption gradually increases with the increase in income, but there are significant differences in the elasticity of household education expenditure among different income groups. Xu Hongjuan et al. [11] conducted a study on urban households in Guangdong province and found that the proportion of education expenditure in household consumption gradually increases with the increase in income, but the positive correlation between education expenditure and family income is weakened. Chen Rong [12] conducted an empirical study on rural households in Zhejiang province and found that the proportion of education expenditure in household consumption gradually increases with the increase in income, but there are significant differences in the elasticity of household education expenditure among different income groups, and there are also huge differences in education expenditure among families in different income groups.

In summary, domestic and foreign scholars have accumulated rich analysis of household education investment and expenditure. From the literature review process, it can also be seen that with the development of the economy, different families will tend to choose higher quality and better education for their children under the premise of economic ability. Scholarly research shows that under the influence of economic development and macro education policies, both direct and indirect education expenses in household education expenditure have been increased to varying degrees, and the content of education expenditure is becoming more and more diversified. However, these studies are mostly concentrated in large cities or remote rural areas, and there are few studies on Hubei province from the literature research objects. Hubei province, as a province with medium economic level, residents attach great importance to education investment, and urban residents regard education as an important way

to improve inter-generational relationships in their families. Therefore, it is necessary to study the income elasticity of urban household education expenditure in Hubei province for the formulation of education investment and development policies in Hubei province.

3. Analysis of Per Capita Disposable Income and Household Education Expenditure of Urban Residents

Kang and Hsu [13] pointed out in their study that family education expenditures not only include direct education costs such as tuition and textbook fees, but also various additional expenses such as extracurricular activities, learning resources, and tutoring, all of which have a positive impact on student achievement and learning outcomes. At the same time, these additional expenses are closely related to family income. Ladd, H. F [14] mentioned that in the United States, some families choose to locate in order to provide better educational opportunities for their children, which results in additional expenses including transportation, housing, and other related costs. This article considers all monetary expenditures closely related to the education product that the learner benefits from as part of family education expenditures.

3.1 Growth of Education Expenses Within the Average Budget of Education Students

Compulsory education and high school education are the stages of children's education that urban residents attach great importance to, and the proportion of families' investment in education in these two stages is also high. Compared with the national and Hubei financial investment and growth rate of compulsory and high school education in 2013-2020 is shown in Table 1, Hubei Province has a large financial investment in junior and high school education, which is higher than the national average in most years.

3.2 Analysis of Per Capita Disposable Income of Urban Households

Based on a statistical analysis of the data on the per capita disposable income of urban households nationwide from 2013 to 2021, the trend is on the rise. the data sources are as follows: 2013-2021 China Statistical Yearbook and Hubei Provincial Statistical Yearbook.

(1) Changes in per capita disposable income of urban households with the continuous development of economic society and the rapid

Table 1: Growth of Education Expenses Within the Average Education Student Budget of China and Hubei Province from 2013 to2020 (Unit: Yuan)

Year	Area	Ordinary primary school		Ordinary junior high school		Ordinary senior high school	
		Budgetary fund	Rate of rise /%	Budgetary fund	Rate of rise /%	Budgetary fund	Rate of rise /%
In 2013	The national average	6901.77	12.61	9258.37	13.78	8448.14	8.64
	Hubei province	5408.12	12.25	8543.48	16.58	6277.74	19.01
In 2014	The national average	7681.02	11.29	10359.33	11.89	9024.96	6.83
	Hubei province	7020.68	29.82	11347.73	32.82	7835.42	24.81
In 2015	The national average	8838.44	15.07	12105.08	16.85	10820.96	19.90
	Hubei province	8790.99	25.22	14435.84	27.21	11535.98	47.23
In 2016	The national average	9557.89	8.14	13415.99	10.83	12315.21	13.81
	Hubei province	10076.72	14.63	17271.97	19.65	14174.22	22.87
In 2017	The national average	10199.12	6.71	14641.15	9.13	13768.92	11.8
	Hubei province	11030.98	9.47	18635.99	7.90	16371.65	15.50
In 2018	The national average	11328.05	3.82	16494.37	4.79	16446.71	8.64
	Hubei province	10597.83	-4.09	17439.10	-6.81	17672.42	6.27
In 2019	The national average	11949.08	5.48	17319.04	5.00	17821.21	8.36
	Hubei province	11039.60	4.17	18201.64	4.37	20066.20	13.55
In 2020	The national average	12330.58	3.19	17803.6	2.80	18671.83	4.77
	Hubei province	11426.27	3.50	18547.58	1.90	19001.05	-5.31

Data source: 2013-2021 China Statistical Yearbook and Hubei Provincial Statistical Yearbook.

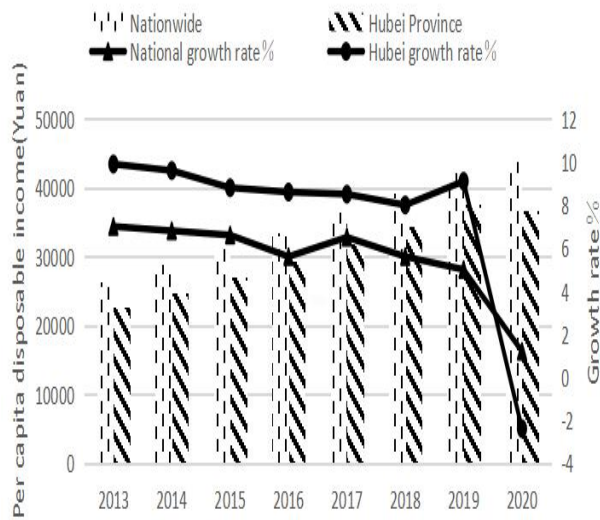


Figure 1: Disposable Income of Urban Residents Nationwide and in Hubei Province 2013-2020

progress of science and technology in the past eight years, the living standards of our people have been continuously improving. As one of the important indicators of national economic development, per capita disposable income of residents can reflect to a certain extent the development level of social productivity and the living standard of the people in a country. In 2013, the per capita disposable income of urban residents nationwide was only 26467 yuan. By 2020, the per capita disposable income of urban residents nationwide had increased by about 166% to 43834 yuan. In Hubei Province, the per capita disposable income of urban residents had increased from 22668 yuan to 36706 yuan, an increase of 162%, both achieving rapid growth.

(2) Changes in per capita disposable income of urban households in Hubei Province and comparison with the national average. From 2013 to 2020 is shown in Figure 1, the absolute growth value of per capita disposable income in the country was 17367 yuan, while the absolute growth value of per capita disposable income in Hubei Province was 14038 yuan, reaching about 81% of the national growth level. Overall, the growth rate of per capita disposable income in China is basically the same as that of Hubei Province over the past eight years. However, based on the growth rate of per capita disposable income over the past eight years, Hubei Province has experienced a higher growth rate than the national level for seven years, and only in 2020, due to the epidemic, was lower than the national average growth rate. Even so, there is

still a large gap between the per capita income of Hubei Province and the national average.

3.3 Analysis of Education Expenditure of Urban Households

Guiding residents to establish a reasonable consumption structure and concept, and reducing education expenditure can improve residents' happiness index to a certain extent. Based on the analysis of household education expenditure of urban residents from 2013 to 2020 is shown in Table 2, it is found that there is an upward trend with the steady increase in per capita income of urban residents. In order to maintain consistency in the data caliber, the data of "Urban Residents' Education, Culture, and Entertainment Service Expenditure" in the Hubei Statistical Yearbook is used as the benchmark data of urban residents' education expenditure.

(1) Changes in national per capita education expenditure

From 2013 to 2020, the quality and level of education in China continued to rise, and the people's pursuit of high-level education continued to rise. the intuitive manifestation is that with the increase in per capita disposable income, education expenditure showed a stable growth trend. In 2013, the national per capita education expenditure was 2294 yuan, by 2019, the national urban residents' education expenditure reached 3328 yuan, and in 2020, due to the impact of the epidemic, it slightly decreased to 2592 yuan, But the growth has basically doubled.

(2) Changes in education expenditure of urban households in Hubei Province

In 2013, the education expenditure of urban residents in Hubei Province was 1922.83 yuan, and by 2019, the education expenditure of urban residents in Hubei Province had nearly doubled to 2967 yuan. Due to the impact of the epidemic in 2020, there were significant changes in the data, which will not be considered temporarily. From the perspective of education expenditure across the country and Hubei Province, education expenditure basically accounts for 6% to 9% of per capita disposable income. However, in absolute terms, before 2013, education expenditure in Hubei was only about 60% of the national level, but after 2014, the absolute value of education expenditure in Hubei gradually increased to between 80% and 90% of the national level.

Table 2: Family Education Expenditure of Urban Residents in Hubei Province from 2013 to 2020 (Yuan)

A particular year	National urban residents				Urban residents of Hubei Province			
	Per capita disposable income	Family education expenditure	Expenditure on household education grew up	The proportion of education expenditure	Per capita disposable income	Family education expenditure	Expenditure on household education grew up	The proportion of education expenditure
In 2013	26467	2294	12.78%	8.67%	22906	1922.83	16.40%	8.39
In 2014	28844	2142	-6.63%	7.43%	24852.3	1894.84	-1.46%	7.62
In 2015	31195	2383	11.25%	7.64%	27051	1972.2	4.08%	7.29
In 2016	33616	2638	10.70%	7.85%	29386	2228.38	12.99%	7.58
In 2017	36396	2847	7.92%	7.82%	31889.4	2420.9	8.64%	7.59
In 2018	39251	2974	4.46%	7.58%	34454.63	2694.6	11.31%	7.82
In 2019	42359	3328	11.90%	7.86%	37601.36	2967	10.11%	7.89
In 2020	43834	2592	-22.12%	5.91%	36706	2040.8	-31.22%	5.56

Data source: 2013-2021 China Statistical Yearbook and Hubei Provincial Statistical Yearbook

4. Data Calculation and Analysis

4.1 Income Elasticity

Elasticity is a commonly used analytical method in economic and social research and statistical analysis, which reflects or measures the degree of response or influence between two economic variables. According to the theory of elasticity, income elasticity of household education expenditure is the degree of reflection of household education expenditure to changes in household income, indicating the magnitude of the impact of changes in household income on household education expenditure. The study defined per capita disposable income of urban residents as the independent variable and household education expenditure as the dependent variable to calculate the elasticity value. Assuming a function $Y=f(x)$, when $x \rightarrow x + \Delta x$, $y \rightarrow y + \Delta y$, the elasticity coefficient is [15]: $E = (\Delta Y/Y) / (\Delta X/X) =$. Where E is the elasticity coefficient of household education expenditure, Y is urban residents' household education expenditure, ΔY is the change in urban residents' household education expenditure, X is per capita disposable income of urban residents, and ΔX is the change in per capita disposable income of urban residents. As household education (services) belongs to normal goods, household education expenditure income elasticity belongs to income elasticity. According to the theory of income elasticity, household education expenditure income elasticity is always greater than 0, indicating a positive correlation between household education expenditure and household income. However, due to differences in income levels, household education expenditure elasticity values may be less than 1 or greater than 1.

Generally speaking, when household income is very low (poor, not reaching the level of subsistence), household education expenditure elasticity values are less than 1. When household income is relatively low (after subsistence, moderate prosperity), household education expenditure elasticity values will be greater than 1 in civilized societies. When household income reaches a high level (rich), its elasticity value will be less than 1. Therefore, before the household reaches high income, the elasticity value of household education expenditure usually shows an increasing trend.

4.2 Results and Analysis Basis

The elasticity of household education expenditure calculated based on the per capita disposable income of urban households and household education expenditure of urban residents in Hubei Province from 2013 to 2020 is shown in Figure 2 (excluding the abnormal data in 2020)

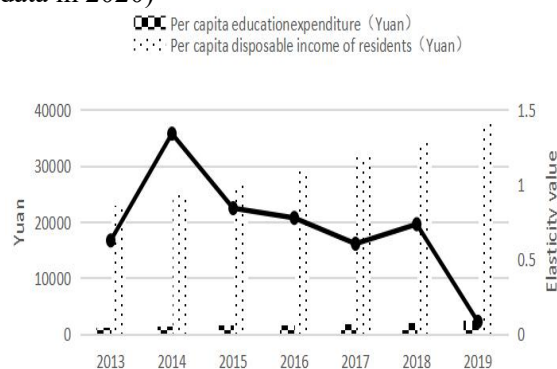


Figure 2: Elasticity of Household Education Expenditure of Urban Residents in Hubei Province 2013-2020

According to the elasticity of household education expenditure in Hubei Province, it can be seen that from 2015 to 2019, the income elasticity of household education expenditure in

Hubei Province was between 0 and 1, which showed a lack of elasticity, indicating that the income level of residents at this stage was relatively low. Although the expenditure on education would also increase when the income increased, more of the increased income may be used to improve living expenses. Only in 2014, the elasticity of household education expenditure in Hubei Province was greater than 1, showing a rich elasticity, reflecting to some extent the changes in the affluence of urban residents in Hubei Province with the improvement of the economy. As can be seen from the figure, the overall education expenditure in Hubei Province lacks elasticity. On the one hand, the economy in Hubei Province lacks vitality, and on the other hand, the public education funds in Hubei Province are relatively sufficient. Considering various factors comprehensively, as a result, the elasticity of household education expenditure among urban residents in Hubei is relatively low. With the implementation of the dual reduction policy, households need to focus on non-monetary expenditure on education.

5. Conclusions

First, establish a correct concept of education consumption. With the increase of family income, on the premise of equal educational opportunities, families will achieve inter-generational replacement by increasing education expenditure. With the goal of becoming prominent and glorifying their ancestors, they have focused on exam-oriented education as their investment focus, and extracurricular expansion education has also focused on supplementary courses in disciplines. This is inconsistent with the quality education advocated by the country, and also seriously violates the policy of "Opinions on Further Reducing the homework burden and extracurricular training burden of students in compulsory education" jointly issued by the two offices in 2021. This irrational investment in education, on the one hand, promotes the profit-seeking nature of the social education system, on the other hand, it will increase the educational consumption burden of urban residents' families, and the education that fosters premature growth also destroys the law of education. Therefore, it is necessary to establish a correct concept of education consumption at the social and family levels, comply with the laws of education development, and schools play

a leading role in education. They should pool their efforts to help build a healthy education ecosystem and cultivate qualified talents required for socialist modernization in the new era.

Second, increase government investment to promote education equity. Compared with the growth rate of household education expenditure of urban residents in Hubei Province, the growth rate of household education expenditure in Hubei Province is much higher than that of education expenditure in Hubei Province, reflecting to some extent that the proportion of household education expenditure to per capita disposable income of urban residents in Hubei Province is relatively high and the educational burden is relatively heavy. From the perspective of the national and provincial allocations for compulsory education and high school education, the financial allocations in Hubei Province are higher than the national average in most years. From the perspective of the education expenditures of urban residents in Hubei Province, they have increased year by year, accounting for a high proportion of total expenditures, indicating that urban residents in Hubei Province have a high demand for high-quality education and spend more on expanding education for their children. To some extent, it has also brought a burden to urban households. Therefore, Hubei Province should increase government investment in education.

Third, accelerate the improvement of the per capita income of urban residents in Hubei Province. According to the research, there is a positive correlation between household education expenditure and household income, and the proportion of education expenditure to household expenditure is high. In the long run, it will squeeze the demand of residents for other consumption, and excessive education expenditure for low-income families is more likely to form educational anxiety. In recent years, the growth rate of household per capita income in Hubei Province is slower than the national average, and the growth rate of education expenditure is comparable to the national average, even higher than the national average for a few years. At the same time, it is important to note that the per capita income of urban residents in Hubei Province is lower than the national average. Therefore, the government should try to improve the household income of urban residents, and pay attention to the

inflection point of marginal education expenditure of residents, At the same time, the formulation of education policies and public expenditure policies should be systematically considered to ensure that household education expenditure develops in a reasonable direction.

Fourth, optimize the investment structure of family education. the research shows that the demand of urban residents in Hubei Province to increase household education expenditure objectively exists and is on the rise. However, during the epidemic period, the economic downturn has led to an increasing burden on residents. Whether starting from reducing the burden on parents or from better education, parents should pay attention to the trend of non-monetary investment in the structure of education investment. the research results show that in family education, time investment is directly proportional to children's cognitive ability and academic performance, that is, the positive effect of reasonable parental companionship on children's cognitive ability and academic performance is greater than the positive effect of extracurricular counseling [16] 157-162. It is not advisable to replace energy investment with simple economic investment. the growth of children requires parents' time investment, emotional support and companionship, as well as communication and interaction. [17] 28-29. Therefore, parents should focus on emotional engagement (parental expectations, family atmosphere) and time engagement (parent-child communication, home-school interaction).

Acknowledgements

This work was supported by Development and Application of Agricultural Labor Education Curriculum Resources in Rural Primary Schools - Based on a Survey of Five Rural Primary Schools in Huanggang. Subject Number: 5032023045.

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