The Impact of Fiscal Public Service Expenditure on Labor Supply -- Taking Guangdong Province as an Example

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Abstract

This article analyzes the impact of Guangdong Province's fiscal basic public service expenditures on labor supply, divides Guangdong Province into three major regions, and explores the impact of fiscal investment in basic public services on the quantity and quality of labor force, using the 2007-2018 data of 21 prefecture-level cities in Guangdong Province. The empirical results show that the fiscal basic public service expenditures in Guangdong Province, the East and West Wings and the Northern region have a positive effect on labor supply, while the Pearl River Delta region fiscal basic public service expenditures have no significant effect on labor supply. It is recommended to: increase financial investment in basic public services and improve the overall quality level of public services; promote the equalization of basic public services and promote the rational distribution of population and labor between regions in the province; break the household registration restrictions and include the floating population in the scope of basic public service guarantees; improve public services, attract more high-quality talents, increase investment in education, and improve the quality of the stock labor force; introduce market mechanisms to attract private capital through public finances.

Keywords

Fiscal basic public service expenditure; Labor quantity; Labor quality.

1. INTRODUCTION

Labor is the main input factor for social production and economic growth. As a populous province and the pioneer of reform and opening up, Guangdong province has benefited a lot from this special demographic dividend, with rapid economic and social development. However, with the development of social economy and the increasing degree of aging, Guangdong Province is facing the dual challenge of labor force quantity and labor quality. From a quantitative point of view, although the overall labor force is large, there is still a slowdown in growth rate and uneven distribution among regions. In terms of quality, the education level of the labor force in Guangdong Province is relatively low, and there is a shortage of highly educated and highly skilled personnel, so the quality of the labor force needs to be improved urgently. At present, people, especially high-quality labor, have an increasingly strong demand for social security, education, medical and other public services in the place of employment. Public services have become an important factor affecting labor settlement. In addition, education investment is an important part of human capital investment. The government promotes the accumulation of human capital by providing public services such as education, so that improves the skill level of the labor force, and promotes the improvement of labor quality. Based on this, by analyzing the impact of fiscal public service expenditures on labor supply, this article explores whether fiscal investment in public services will increase the quantity and

quality of labor, in order to provide ideas for the population and economic and social development of Guangdong Province.

2. LITERATURE REVIEW

Current researches mostly study the relationship between public services and labor supply from the perspectives of education investment, social security, and public services for the floating population. Under the current social background of increasing population aging, government investment in education has a guarantee effect on labor employment, which can effectively offset the negative impact of the aging population structure (Liu and Qin, 2016) [1]. Guo et al. (2018) [2] used surplus rural labor as a perspective and pointed out that there are regional differences in the impact of lag period education expenditure on the non-agricultural employment of rural labor. Wang et al. (2019) [3] evaluated the "National Compulsory Education Project in China's Poor Areas" in the mid-1990s and pointed out that the project significantly improved the education level of beneficiary children, but on the whole it failed to effectively increase the income level of beneficiary groups.

Cheng (2014) [4] believes that the old-age security system significantly promotes the supply of labor, and the impact on rural labor supply is more significant. Qu (2014) [5] pointed out that the pension insurance system has an impact on labor supply, so it is necessary to improve the corresponding mechanism of pension insurance funds to promote the improvement of labor supply. Gao et al. (2015) [6] believes that the allocation of state-owned capital for endowment insurance will increase personal welfare and shift parents from focusing on the number of children to focusing on the quality of children, thereby promoting the improvement of human capital. Zhou et al. (2017) [7] analyzed the behavior of middle-aged and elderly labor supply from the perspective of the new rural insurance, and believed that there was no significant relationship between the two. Ai et al. (2019) [8] analyzed the impact of the choice of the pension insurance system on the quality of labor supply under the aging of the population. Research shows that the fund accumulation system and the nominal account system will increase the proportion of skilled labor, and the income-related pay-as-you-go system It will further increase the human capital of skilled workers and improve the quality of labor supply.

The transfer of labor across regions is an important way of labor supply. Many scholars study the relationship between public services and labor supply based on the perspective of labor mobility. Xia et al. (2015) [9] believe that people will move to places with better public services, and promoting the equalization of public services can alleviate the uneven distribution of urban population, but the effect is limited. Liu et al. (2017) [10] pointed out that migrants with higher human capital, large cities with household registration, and small family burdens are more likely to obtain public services and have a stronger desire to live. Lin et al. (2019) [11] believe that the willingness of the migrant population to settle is directly proportional to the degree of public service access, and this effect becomes more significant as the scale of the city expands. Hou (2016) [12] divided public services into industrial citizenship public services and social citizenship public services, and concluded that both public services are attractive to population inflows. Yang (2017) [13] found through research that the quality of public services promotes population mobility, but there are differences between different public service types and different city sizes. Dong et al. (2021) [14] used city scale as a threshold variable and analyzed the CMDS micro-data of 244 cities to find that when when the city reaches a certain scale, increasing the basic public services can effectively encourage more high-quality labor inflow.

In summary, it can be found that the research on the financial public service expenditure on the labor supply is less divided into two aspects of labor quantity and quality for specific research. In addition, research is mostly concentrated at the provincial level, and the research at the prefecture and city level mostly adopts a micro perspective. Based on this, this article

uses the macro data of 21 cities in Guangdong Province to divide the labor supply into labor force quantity and labor quality, and specifically analyzes the impact of fiscal public service expenditure on labor supply.

3. EMPIRICAL RESEARCH

3.1. Assumption

According to above discussion, the empirical analysis of this article mainly discusses the impact of fiscal basic public service expenditure on labor supply. Han et al. (2010) [15] pointed out that basic public services provide the people with the most basic public services closely related to the people's livelihood within the scope that the government may provide, which means the scope and level of public services provided by the government directly affect the residents' Welfare level and specific living conditions. In the current stage of social development, when laborers choose places of employment, they often choose places that can provide better quality basic public services. Financial investment in basic public services has increasingly become an important factor affecting labor supply (Fang and Yang, 2013; Tong and Wang, 2015) [16][17].

Further analysis, with the continuous development of the social economy, the internal differentiation of the floating population is increasing, the irreplaceability of high-quality labor in the job market is stronger, and the income level is higher. The difference in income affects the lifestyle, needs and habits of different labor groups (Chen and Liang, 2014) [18], so compared to low-quality labor, high-quality labor pays more attention to public services that help improve the quality of life. He (2020) [19] pointed out that the higher level of public service expenditure in the inflow places is conducive to the inflow of labor with high education levels. In addition, high-quality labor is more likely to obtain basic public services in the place of employment. Liu, Yu and Zhao (2017) [10] take the Yangtze River Delta as an example to study the impact of urban public service acquisition characteristics on the willingness of migrants to stay, and point out that groups with higher human capital are more likely to obtain urban public services and stay in the inflow area.

This article takes Guangdong Province as an example, combines the characteristics of Guangdong Province's labor supply, and takes 21 prefecture-level cities in Guangdong Province as the research object to explore the role of financial basic public service expenditures on labor supply. Summarizing and referring to relevant literature research, the following hypotheses are proposed for the subsequent analysis of this article:

(1) Financial investment in basic public services is an important factor affecting the labor quantity, that is, fiscal basic public service expenditures promote the increase in the number of laborers.

(2) Fiscal basic public service expenditures have a positive effect on the quality of labor supply, which is conducive to optimizing the structure of labor supply quality.

3.2. Model Setting

Aiming at the hypothesis, this article constructs a fixed-effect model. Since this article divides the labor supply into two aspects: labor quantity and labor quality, two models are constructed as follows:

$$LI_{it} = \beta_0 + \beta_1 * FPS_{it} + \beta_2 * Z_{it} + \xi_{it} \tag{1}$$

$$QL_{it} = \beta_0 + \beta_1 * FPS_{it} + \beta_2 * Z_{it} + \xi_{it} \tag{2}$$

Among them, i represents the cross-section (the dimension of prefecture-level cities in Guangdong Province); t represents the time dimension (year). LI refers to the labor quantity, QL refers to the quality of labor, and FPS refers to expenditures on basic public services, including education expenditures, social security and employment expenditures, and medical health and family planning expenditure. Z represents other control variables added to the model, and specific indicators are described later.

3.3. Variable Selection

3.3.1 Explained variables

The explained variable in this article is labor supply, which is mainly divided into labor quantity and labor quality. Regarding labor supply, most of the literature chooses to measure the scale of labor supply (Li, 2014; Cai, Zhou and CHOW, 2018) [20] [21], and some studies use labor quantity, labor quality, and labor structure (Yang, Gong and Han, 2017; Song and Zuo, 2019) [22] [23] or labor quantity, quality and cost (Yang, Zhao, Gong and Yang, 2018) [24] define labor supply. In addition, Liu (2017) [25] measured labor supply by working hours of laborers, and Yang et al. (2019) [26] analyzed labor supply into labor force quantity, quality, age structure, and labor productivity efficiency. In view of the large scale of labor supply in Guangdong Province, but the quality of labor is lower than that of other economically developed regions, this article adds the variable of labor quality, and chooses the quantity and quality of labor supply as the research scope of labor supply.

The labor quantity (LI) refers to the size of the labor force. The labor force in this article refers to the labor force who is willing and able to provide labor in the labor market. Regarding the division of the labor force, the international common standards and the Chinese statistics department all define the 15-64 year-old population as the working-age population, and based on whether they have the willingness to find employment and the ability to work, the working-age population is further divided into "labor population" and "non-labor population". In fact, the working-age population and the labor force population are cross-relationships. Not all the working-age population is at the working-age stage. Some people over working age continue to participate in social labor activities. Employment groups exceeding the upper working age should also be included in the labor force. Therefore, this article uses the number of employees to measure the labor force, and refers to Cai et al. (2018) [21] to express the labor force as the proportion of the number of employed persons at the year-end in the permanent population.

The labor quality (QL) focuses more on the comprehensive quality and knowledge level of the labor force, as well as the competence to adapt to the new economic development model and economic development needs. Its essence is the level of human capital stock contained in the labor force (Jiang and Wang, 2019) [27]. Regarding the measurement of labor quality, it is mainly based on the number of years of education (Zhang, Leng and Zeng, 2020) [28], the proportion of college students (Xia and Lu, 2019; Qin, Zhang and Liu, 2019) [29] [30] and the number of R&D employees (Li and Jiang, 2020) [31] method. This article expresses labor quality by the number of people in institutions of higher education per 10,000 people.

3.3.2 explanatory variables

The explanatory variable of this article is fiscal basic public service expenditure (FPS). The concept of public service originated from Adam Smith, and later Buchanan (1950) [32] and others redefine basic public service from the perspective of public goods. Most literature defines fiscal education expenditure, social security and employment expenditure, and medical health and family planning expenditure as fiscal basic public service expenditures (Ji and Bao, 2019; Wang, Yu and Huang, 2019) [33] [34]. In addition, Zeng et al. (2019) [35] defined basic public services as five aspects: basic public education, basic public medical care, basic social insurance, basic public culture, and infrastructure. Zhu et al. (2020) [36] is divided into five

dimensions: compulsory education, medical and health, social security, infrastructure and culture. Based on the existing research, this article expresses the expenditure on basic public services of finance to meet the basic living needs of the people in education expenditure, social security and employment expenditure and medical health and family planning expenditure.

3.3.3 Control variables

With reference to existing research, this paper selects other factors affecting labor supply as control variables to adjust and modify the regression model. In terms of the model of the relationship between fiscal basic public service expenditure and labor force quantity, five variables of city size (CS), economic development level (GDP), fixed asset investment (PAI), industrial structure (IS) and wage level (SAR) are selected as control variables. In terms of the model of the relationship between fiscal basic public service expenditure and labor quality, the economic development level (GDP), wage level (SAR), industrial structure (IS) and housing price (HP) are selected as control variables.

3.4. Data Description and Sample Description

Based on the status quo of labor supply in Guangdong Province, this paper studies the impact of financial basic public service expenditures on labor supply, so 21 prefecture-level cities in Guangdong Province are selected as the research objects. Since 2007, fiscal revenues and expenditures have used new classification subjects, the fiscal budget subjects and statistical calibers around 2007 are quite different, and some data in 2019 are missing, so the relevant data from 2007 to 2018 is selected. The data includes data on labor, fiscal basic public service expenditures and city characteristics, and take the logarithm of the data.

At the same time, Guangdong Province is divided into three regions, namely the Pearl River Delta (Guangzhou, Shenzhen, Dongguan, Zhuhai, Foshan, Zhongshan, Jiangmen, Huizhou, and Zhaoqing), and the East and West Wings (Shantou, Shanwei, Chaozhou, Maoming, Jieyang, Yangjiang and Zhanjiang) and the Northern region (Yunfu, Shaoguan, Meizhou, Qingyuan and Heyuan).

The data in this article comes from the National Bureau of Statistics of China, the Statistics Bureau of Guangdong Province and Guangdong cities, "China City Statistical Yearbook", "China Statistical Yearbook for Regional Economy", "China Labor Statistics Yearbook", "Guangdong Statistical Yearbook", Statistical Yearbooks" and "Statistical Communiqué of National Economic and Social Development" of 21 prefecture-level cities in Guangdong Province.

The descriptive statistics of related variables in this paper are shown in Table 1.

3.5. Empirical Analysis

3.5.1 Empirical analysis of the effect of fiscal basic public service expenditure on labor force

(1) Analysis of the impact of financial basic public service expenditure on labor quantity

From the perspective of the whole Guangdong Province, the impact of fiscal basic public service expenditure on the number of labor force is significantly positive at the level of 1%, which is in line with the hypothesis 1 of this article. It can be seen that there is an obvious positive relationship between the two. Increasing fiscal expenditure on basic public services can effectively increase the number of labor supply in the region.

From a regional perspective, there are regional differences in the impact of fiscal basic public service expenditures on the labor quantity. The impact of fiscal basic public service expenditures on the labor force in the the East and West Wings and the Northern region is significantly positive at the 1% level. Although the coefficient in the Pearl River Delta region is positive, it fails the significance test. This may be due to its large scale of cities and obvious urban advantages, which can better promote the increase in the number of laborers based on the scale effect of the large cities themselves and continue to attract labor inflows.

Table 1. Variable description and descriptive statistics

Variable	Variable description	Mean	Std. Dev.	Min	Max
lnLI	The logarithm of the number of employed persons as a proportion of permanent population at the Year-end	3.9844	0.1732	3.6805	4.4379
lnQL	The logarithm of the number of students in institutions of higher education per 10,000 people	4.1924	1.0273	2.5173	6.7065
lnFPS	The logarithm of the total expenditure of education expenditure, social security and employment expenditure, medical and health and family planning expenditure in the proportion of public budget expenditure	3.7100	0.2311	2.6995	4.1047
lnCS	The logarithm of permanent population	6.0825	0.5207	4.9934	7.3068
lnGDP	The logarithm of GDP per capita	10.6162	0.6819	9.2045	12.1525
lnPAI	The logarithm of fixed asset investment	6.6034	0.8859	4.7944	8.7649
lnSAR	The logarithm of Annual Average Wage of Fully Employed Staff and Workers in Urban Units	10.6377	0.4361	9.6186	11.6248
lnIS	The logarithm of the tertiary industry's regional GDP	3.7284	0.1833	3.3043	4.2732
lnHP	The logarithm of the ratio of the average sales price of commercial housing to the per capita disposable income of residents	-1.4234	0.3163	-2.0077	-0.0611

(2) Analysis of the influence of control variables on the labor quantity

1) City size. In general, the impact of city size on the number of labor forces in Guangdong Province is significantly positive at the 5% level, indicating that the expansion of the population size is conducive to increasing the number of labor forces. The impact of city size on the number of labor force varies greatly in different regions. The Pearl River Delta region and the Northern region are significantly positive at the levels of 1% and 5%, respectively, and the Pearl River Delta region is the most significant. This may be related to the large scale of its own city and its strong attractiveness to labor. The coefficient of the city size in the East and West Wings to the labor quantity is positive, but the significance test is not passed. This may be related to the small population size of the East and West Wings and the serious population loss, which makes it difficult to exert the scale effect of cities.

2) The level of economic development. The impact of the level of economic development on the labor quantity in Guangdong Province, the East and West Wings and the Northern region is significantly positive at the level of 1%, indicating that there is a positive relationship between the level of economic development and the labor quantity. The economic development level of the Pearl River Delta region has an insignificant impact on the labor force, which may be related to the crowding-out effect in economically developed regions.

3) Investment in fixed assets. Except for the positive correlation between fixed asset investment and labor quantity in the Pearl River Delta region, the results of Guangdong Province, the East and West Wings and Northern Region are not significant, and the coefficient is negative. According to the explanation of Xia et al. (2015) [37], it may be local government that has given

more incentives to the development of capital-intensive industries, resulting in excessive capital deepening. Cities where investment accounts for a high proportion of GDP often have insufficient job creation capacity, which is not conducive to absorbing migrant labor.

4) Wage level. In terms of the impact of wage levels on the number of labor forces, Guangdong Province and various regions are all significantly negative at the 1% level. It may be explained that the relatively high level of economic development in Guangdong comparing to other regions, and the greater income effect of the labor wage rate than the substitution effect can lead to an inverse relationship between wages and labor supply.

5) Industrial structure. In general, the impact of the industrial structure of Guangdong Province, that is, the proportion of the tertiary industry on the labor force, is significantly positive at 5%. In terms of sub-regions, the Pearl River Delta and the East and West Wings are significantly positive at 5% and 10% respectively, indicating that the increase in the proportion of the tertiary industry is conducive to promoting the increase in the number of labor forces in the region. However, the Northern region failed the significance test, which may be related to the late development of the tertiary industry in the Northern region and insufficient driving force for labor supply.

Table 2. The Impact of fiscal basic public service expenditure on the labor quantity

Variable	Guangdong	the Pearl River Delta	the East and West Wings	the Northern region
lnFPS	0.0716*** (3.45)	0.0416 (1.47)	0.0713*** (2.94)	0.0848*** (3.45)
lnCS	0.1283** (2.29)	0.4117*** (2.60)	0.0477 (0.71)	0.1646** (2.56)
lnGDP	0.0764*** (2.88)	-0.0158 (-0.57)	0.1172*** (3.38)	0.1018*** (3.07)
lnPAI	-0.0009 (-0.10)	0.0188*** (2.70)	-0.0032 (-0.24)	-0.0126 (-0.96)
lnSAR	-0.1041*** (-4.34)	-0.0643*** (-2.81)	-0.1191*** (-3.31)	-0.1127*** (-3.97)
lnIS	0.0680** (2.34)	0.0625** (2.40)	0.0780* (1.82)	0.0502 (1.29)

Note: The results in the table are only obtained by Stata 15. *, **, *** are significant at the levels of 10%, 5%, and 1%, respectively, and the value in parentheses under the coefficient is the t value.

3.5.2 Empirical analysis of the effect of fiscal basic public service expenditure on labor quality

(1) Analysis of the impact of fiscal basic public service expenditure on labor quality

In Guangdong Province, the impact of fiscal basic public service expenditure on labor quality is significantly positive at the 1% level, indicating that the expansion of the proportion of fiscal basic public service expenditure is conducive to improving labor quality, which is aligned with Hypothesis 2. Therefore, it is possible to promote the improvement of labor quality by expanding fiscal expenditures on basic public services.

From a regional perspective, in the East and West Wings and the Northern region, the fiscal basic public service expenditure has a significant effect on labor quality, which is significantly positive at the levels of 1% and 5% respectively. However, the fiscal basic public service expenditure in the Pearl River Delta region does not have a obvious impact on the quality of labor, and the significance test is not passed, and the coefficient is negative. On the one hand, it may be due to the large scale of cities in the Pearl River Delta, and its own city scale effect has

better promoted the entry of high-quality labor, and weakened the impact of fiscal basic public service expenditures. On the other hand, it may be that high-quality labor is more seeking to improve the quality of life, so they have a stronger demand for basic public services. Basic public services are often linked to household registration. In the Pearl River Delta, the conditions for settlement are more stringent. It is difficult for high-quality labor to obtain high-quality basic public services. The increase in financial investment in basic public services for the registered population has squeezed out high-quality migrant labor.

(2) Analysis of the influence of control variables on labor quality

1) The level of economic development. The economic development level of Guangdong Province and various regions has a positive impact on labor quality, and it is significant at the level of 1%. This shows that the level of economic development has a significant role in promoting labor quality, and economic factors are still an important factor affecting labor quality.

2) Wage level. The wage level in Guangdong Province and the Pearl River Delta region has an inverse relationship with the improvement of labor quality, and it is significant at the level of 5%. The Northern region is significantly negative at the 10% level, while the East and West Wings fail the significance test.

3) Industrial structure. Regarding the impact of industrial structure on labor quality, Guangdong Province and the Northern region are significantly positive at the levels of 10% and 1%, respectively, while the Pearl River Delta and the East and West Wings have not passed the significance test. This may be due to the fact that the Pearl River Delta and the East and West Wings have more developed manufacturing industries, which attract high-quality and highly-skilled talents in the manufacturing industry. The increase in the proportion of the tertiary industry has weakened the attractive effect of regional industrial advantages on high-quality labor.

Table 3. The Impact of fiscal basic public service expenditure on the labor quality

Variable	Guangdong	the Pearl River Delta	the East and West Wings	the Northern region
lnFPS	0.3723*** (2.75)	-0.1047 (-0.57)	0.5692*** (3.70)	0.3588** (2.31)
lnGDP	0.7745*** (4.67)	0.7590*** (4.45)	0.7964*** (3.66)	0.8034*** (4.17)
lnSAR	-0.3125** (-2.11)	-0.3662** (-2.45)	-0.2013 (-1.02)	-0.3397* (-1.96)
lnIS	0.3101* (1.73)	0.2642 (1.62)	-0.0322 (-0.13)	0.6346*** (2.64)
lnHP	0.1691* (1.72)	0.0940 (0.82)	0.2988** (2.53)	0.1339 (1.16)

Note: The results in the table are only obtained by Stata 15. *, **, *** are significant at the levels of 10%, 5%, and 1%, respectively, and the value in parentheses under the coefficient is the t value.

4) Housing prices. Guangdong Province and the East and West Wings are significantly positive at the levels of 10% and 5%, while the Pearl River Delta and the Northern region failed the significance test. According to the analysis of Zhang (2016) [38], the positive impact of housing prices on labor quality is that high-quality talents tend to have higher incomes and therefore can afford higher housing prices. At the same time, non-economic factors in cities have

a positive effect. It can offset or partially offset the life pressure brought by rising housing prices. However, ordinary laborers have low incomes, and non-economic factors bring them little utility, so they may flow out because of the increase in housing prices. The rise in housing prices is equivalent to setting a threshold, suppressing the inflow of ordinary labor, and squeezing out labor who cannot afford high housing prices in cities. However, rising housing prices hasn't prevented the inflow of high-quality talents. The increase in high-quality talents and the crowding out of ordinary labor have improved the quality of labor.

4. CONCLUSION

By studying the relationship between basic public service expenditures and labor supply in Guangdong Province, comprehensively combining various influencing factors, we can see that, on the whole, fiscal basic public service expenditures have become an important factor affecting labor supply. Increasing financial investment in basic public services can effectively promote the improvement of labor force quantity and labor quality. From a regional perspective, there are differences in the impact of fiscal basic public service expenditures on labor supply. Expanding the scale of basic public service expenditures in the East and West Wings and the Northern region can more effectively increase the level of regional labor supply.

Based on the conclusions from above research, this article draws the following policy implications: Firstly, increase fiscal investment, increase the proportion of fiscal basic public service expenditures, and improve the overall level of public services. Secondly, promote the equalization of basic public services and increase transfer payments to the East and West Wings and the Northern region to optimize the rational distribution of population and labor among regions within the province. The third is to break through the institutional barriers to the movement of labor across regions, and reduce the difference in public services between the registered population and the floating population. It is necessary to include the floating population in the scope of basic public service guarantees, and continuously improve the level of social security for the floating population. The fourth is to improve the quality of the labor force in many ways. By improving public services, attract more high-quality talents, while increasing fiscal investment in education, and improve the quality of the existing labor force by promoting education, especially the development of vocational schools and technical schools. At last, adjust the channels of fiscal public service investment and introduce market mechanisms into public service field, improving the quality of public services.

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