The Influence of Labor Interprovincial Migration on Regional Economic Development Gap

Xuemei Zhang [1,a,*]

[1]Shanghai Academy, Shanghai University, Chengzhong Road, Shanghai, China

[a] xuemei951107@163.com

[*]corresponding author

Keywords: Net Migration Rate; Theil Index; Regional Economic Development Gap

Abstract: Based on the panel data analysis, this paper makes an empirical analysis on the influence of labor interprovincial migration on regional economic development gap in mainland China from 2000 to 2011. After the reform and opening up, China carried out the reform of the household registration system, began to allow free movement of people. From then on, more and more labour force flows across provinces. In the meantime, China's economy is booming, the economic gap between different regions began to emerge. This paper holds that labor force interprovincial migration has a positive effect on regional economic development, and labor migration increases the economic development gap between the place of entry and place of exit.

1. Introduction

Since the reform and opening up, China's economy has developed rapidly and has become the second largest economy in the world. At the same time of economic growth, the problem of regional economic development gap cannot be ignored. At the beginning of the reform, Deng Xiaoping put forward the strategy of "East Takes the Lead in Development", which aimed to "allow some people get rich, the rich drive late, and the last to achieve common prosperity". The eastern coastal region has realized the rapid economic growth with its superior geographical location. The Western Development proposed in 2000 has also played a certain role in promoting the development of the western region. In 2004, China put forward Rise of Central China. Although the three policies cover the eastern, central and western regions, there are still gaps in the development of different regions. This paper mainly from the perspective of labor force, explore how the cross-provincial labor flow affects regional development gap.

During the period of the planned economy, China implemented a relatively strict household registration system. Labour force cannot flow freely, resulting in a large number of rural surplus labour. The labour market is seriously out of balance. In the 1990s, China began to gradually relax its household registration system. In 2003, laws governing detention and repatriation were repealed, and labor mobility has been completely unrestricted ever since. As a result, more and more workers are moving to cities with higher incomes. The net migration rate of the provinces with more developed economy is positive, while that of the provinces with less developed economy is negative. We can speculate that labor mobility has widened the economic development gap between these cities.

In order to explore whether labor mobility will increase regional economic development gap, we selected inter-provincial panel data for analysis, and added material capital and human capital which related to economic development as control variables. The significance of this paper is to find out the influence of labor flow on regional economic development gap, so as to analyze the measures to reduce regional economic development gap. The structure of this paper is as follows. The second part is a review of the previous literature. The third part introduces the data used in this paper and the model of panel data regression. The fourth part is the analysis of regional gap and the regression of panel data. The fifth part is the conclusion and policy suggestion.

2. Literature Review

Some studies have found that labour mobility widens regional economic development gaps. Liang Hui (2011) believes that in the long run, the flow of labour force widens the economic gap among the three regions in China. Zhou Guangxia and Lin Lefen (2018) analysed it from the perspective of agglomeration economy, believing that the local market effect of rural labour mobility widened the per capita income gap between cities, while the level of human capital it carried narrowed the regional gap. However, on the whole, the migration of labour from rural to urban areas ultimately widened the income gap between cities. Li Daoqing and Chen En (2009) believe that the unbalanced spatial distribution of migrant labour forces exacerbates the gap in regional economic growth in Guangdong province. Fan Shide and Jiang Debo (2011) pointed out that labour flow accelerated the convergence rate of economic growth in developed regions of China, while reduced the convergence rate of economic growth in less developed regions, thus widening the regional gap. Guo Jiang and Tan Mei (2018) argue that labour mobility promotes the economic development of the eastern region, inhibits the economic development of the central and western regions, and widens the regional gap between the eastern and western regions.

Other studies have found that labour mobility narrows regional economic development gaps. Cui Donghua (2015) pointed out that inter-provincial labour flow helps narrow regional economic gap, and the government can promote balanced regional economic development through reasonable and orderly labour flow. Ma Jiao (2013) believed that the net outflow of labour delayed the overall economic development of Hubei province, but this flow pattern narrowed the gap between regions. Liu Huizheng and Wang Lina (2016) believe that labour mobility has promoted economic growth in the Beijing-Tianjin-Hebei region and narrowed the regional gap in per capita consumption, but the gap in per capita GDP has not been significantly improved.

Other studies suggest that labour mobility has different effects on regional economic development gap in different regions or different periods. Zhang Wei (2007) pointed out that the inflow of labour in the eastern region contributed to the regional economic development, but the inflow of labour factors in the central and western regions delayed the regional economic development, which may be related to the difference in the quality of migrant labour. Wen Huili (2017) pointed out that in the eastern and central regions, labour mobility has narrowed the regional economic gap, while in the western and north-eastern regions, labour mobility has widened the regional economic gap. Huang Dunping (2015) pointed out that from 1995 to 2000, labour flow did not converge on regional economy, and labour flow would widen the economic gap between regions. However, from 2005 to 2010, labour flow played a converging role, and labour flow would narrow the regional economic gap.

These literatures are based on panel data or spatial measurement ways to analyze the impact of labour flow on regional economic development gap. Based on previous literatures, this paper expands the data, but based on the availability of data, it expands the data to 2017 when analyzing the regional development gap, and only extends the data to 2000-2011 when conducting panel data regression. In the selection of control variables, material capital and human capital are added.

3. Model and Data

3.1. Model

In order to better describe the impact of cross-provincial labour flow on regional economic gap, our model is set as shown in (1)

$$y_{it} = \alpha + \beta_1 mobility_{it} + \beta_2 capital_{it} + \beta_3 edu_{it} + \varepsilon_{it} \quad (1)$$

Where y_{it} represents the real GDP per capita of province i in year t, $mobility_{it}$ represents the net migration rate of labour force in province i in year t, $capital_{it}$ represents the physical capital (fixed asset investment) of province i in year t, and edu_{it} represents the human capital (education

level) of province i in year t. To eliminate heteroscedasticity, we take the natural logarithm of GDP per capita.

3.2. Data Introduction

The regional economic development in this paper is represented by the real GDP per capita of provinces. Net mobility is used to measure labour mobility across provinces. Among them, the net migration rate is equal to the ratio of the difference (that is, the net migration population) between the population moving in and out and the total population of the province. The control variable is capital, including physical capital and human capital. Among them, the physical capital is represented by fixed assets investment, and the human capital is represented by education, that is, the number of students in universities. Based on data availability, this paper analyzes the regional economic development gap from 2000 to 2017, and carries out panel data regression on the impact of labour flow on regional economic gap from 2000 to 2011.

4. Empirical Analysis

4.1. Regional Gap Analysis

In order to depict China's regional economic development gap, we use the indicators listed in table 1 for analysis. It can be seen that the regional gap in China's economic development is narrowing. According to the Theil index proposed by Shorrocks and the method of decomposition by subgroup, the Theil index of China's per capita GDP from 2000 to 2017 was calculated and decomposed according to the three regions of east and west, respectively calculating the intra-region differences and inter-region differences. The calculated results are shown in table 1. On the whole, China's regional gap shows a decreasing trend. It decreased from 0.0821 in 2000 to 0.0437 in 2017. Between 2000 and 2004, the regional gap narrowed more slowly. Since 2005, the regional gap has narrowed at a relatively rapid pace. But between 2012 and 2017, the regional gap narrowed slightly.

Table 1 The measurement of regional economic development gap.

Year	Gini coefficient	σcoefficient	coefficient of standard deviation	intra-regional Theil index	Inter-regional Theil index	Theil index
2000	0.32315	0.543732	0.702544	0.031388	0.050727	0.082115
2001	0.316085	0.533991	0.682135	0.030014	0.048251	0.078265
2002	0.316351	0.535816	0.677363	0.029462	0.048402	0.077864
2003	0.317453	0.539633	0.671328	0.028799	0.048652	0.077451
2004	0.318711	0.543284	0.667852	0.028639	0.048722	0.07736
2005	0.315229	0.539008	0.650513	0.027475	0.047155	0.074629
2006	0.310491	0.53265	0.632582	0.025955	0.045685	0.07164
2007	0.306135	0.526551	0.617046	0.024941	0.044039	0.06898
2008	0.298278	0.516423	0.590909	0.023693	0.040893	0.064586
2009	0.290669	0.506023	0.568242	0.022585	0.038195	0.060781
2010	0.281626	0.492511	0.543989	0.02117	0.035368	0.056538
2011	0.271191	0.475434	0.518911	0.020184	0.031888	0.052072
2012	0.263766	0.462864	0.502091	0.019609	0.029488	0.049096
2013	0.258624	0.453713	0.490798	0.018906	0.028205	0.047111
2014	0.255198	0.44755	0.482929	0.018458	0.02731	0.045768
2015	0.253531	0.443711	0.479754	0.01845	0.026701	0.045151
2016	0.252331	0.439741	0.478745	0.01886	0.025891	0.044751
2017	0.249834	0.43487	0.472833	0.018357	0.025376	0.043733

4.2. Regression Analysis

4.2.1. Unit Root Test and Co-integration Test

In order to perform the regression better, we first perform the unit root test and the co-integration test. The null hypothesis of the unit root test is that there is no unit root. As can be seen from table 2, only education is stable, while other variables are unstable, and unit root exists. Differential processing is needed to make the data smooth. After testing, we need to make a first-order difference for GDP per capita and net migration, and a second-order difference for fixed asset investment. The results after the difference are shown in table 3.

Table 2 The unit root test.

Unit root test	y	mobility	capital	edu
LLS	2.94755(0.9984)	-3.55400(0.0002)	18.3083(1.0000)	-10.9186(0.0000)
IPS	10.9450(1.0000)	-0.91526(0.1800)	19.6252(1.0000)	-4.07264(0.0000)
ADF	46.5211(0.9285)	70.7291(0.2092)	39.2990(0.9892)	131.321(0.0000)
PP	10.0892(1.0000)	70.6686(0.2107)	0.73275(1.0000)	164.603(0.0000)
Hadri	12.9354(0.0000)	8.09779(0.0000)	12.0148(0.0000)	12.4775(0.0000)

Table 3 The unit root test after the difference.

Unit root test	Y(first difference)	Mobility(first difference)	Capital(second order difference)
LLS	-7.39908(0.0000)	-14.8299(0.0000)	-5.41493(0.0000)
IPS	-3.21901(0.0006)	-10.3579(0.0000)	-5.00044(0.0000)
ADF	96.6066(0.0032)	213.034(0.0000)	151.620(0.0000)
PP	137.897(0.0000)	265.000(0.0000)	140.876(0.0000)

The co-integration test is used for the long-term equilibrium relation, while the error correction model is used for the short-term equilibrium relation. Co-integration implies that there are common random trends. The co-integration test can be used to determine whether the non-stationary sequence has a long-term equilibrium relationship. If there is no co-integration relationship, the regression is a pseudo-regression, and the model needs to be modified. Since the variables after the difference are not integrated of the same order, the co-integration test cannot be carried out.

4.2.2. Regression Result

The results of Hausman test can determine whether it is fixed effect or random effect. The P value obtained by the test was greater than the significance level of 0.05, and the null hypothesis was accepted as a random effect model. According to the regression results of the random effects model, we can see that the goodness of fit of the model is 72%, which is not particularly ideal. As can be seen from table 4, labour mobility is significantly positively correlated with regional economic development, with a coefficient of 0.49, indicating that for every 1% increase in the net labour migration rate, economic development will increase by 0.49%. According to our definition of labour mobility, that is, the net migration rate of labour force in a province, we can conclude that in an area with a positive net migration rate, labour force flow will promote economic development, while in a province with a negative net migration rate, labour force flow will hinder economic development. Therefore, labour mobility will increase the development gap between the place of labour entry and place of exit.

The control variables selected in this paper are physical capital and human capital. It can be seen from the regression results that fixed capital investment can significantly promote economic development, and education can also significantly promote economic development, their coefficients are 0.00004 and 0.007, respectively. Education promotes more than fixed capital investment. This is also the reason why China has made great efforts to develop education in recent years.

Table 4 Panel data regression results.

	FE	RE
α	8.855149***	8.870101***
	（0.0329136）	（0.0648113）
mobility	0.1155258	0.4860848***
	（0.1254868）	（0.1135667）
capital	0.0000391***	0.0000461***
	（6.52e-06）	（6.71e-06）
edu	0.0088115***	0.0073444***
	（0.0010152）	（0.0010195）
R^2	0.7259	0.7173
F	298.30***	815.34***
	（0.0000）	（0.0000）

5. Conclusions and Recommendations

This paper holds that the labour force interprovincial migration can promote regional economic development. By calculating the Theil index and Gini coefficient, we conclude that the regional economic development gap is decreasing, and the panel data regression results show that labour inflow has a significant positive effect on regional economic development. Provinces with a positive net migration rate have faster economic development, while provinces with a negative net migration rate have slower economic development. We believe that labour mobility has widened the economic development gap between the place of entry and place of exit. It can be concluded from the above analysis that although labour flow improves the economic development speed on the whole, it promotes the economic development of the eastern region due to a large number of labour flowing into the eastern region, while the loss of labour in the central and western regions inhibits the economic development of the central and western regions. Based on the influence of labour mobility on different regions, this paper puts forward the following policy suggestions.

First, actively guide the return of labour force. In today's society, the main driver of economic development is the labour force, especially the human capital they carry. Actively guiding the return of labour force can change the current situation of brain drain in the central and western regions and is conducive to promoting the development of local economy.

Second, accelerate the reform of the household registration system and the coordination of urban and rural social welfare. In order to solve the regional economic development gap caused by labour mobility, it is necessary to manage labour mobility better and speed up the reform of the household registration system. In addition, we should continue to promote the reform of the rural homestead system and the construction of the land market, make rational use of rural land, vigorously develop the rural economy, strive for the balance of urban and rural welfare, so that rural areas people enjoy the same employment opportunities, excellent medical and educational resources as big cities, so as to reduce the migration of a large number of rural labour force.

Thirdly, the collaborative mode of industrial transfer and labour return should be established. While actively guiding the return of labour force, we should also actively guide the industrial transfer from the eastern region to the western region, because employment opportunities are an important factor to attract the return of labour force.

Fourth, formulate policies to attract labour. According to our data, Xinjiang is the province with a net inflow of labour. This benefited from the "Western Development" strategy of previous years. Therefore, for the provinces with serious labour loss, in addition to actively guiding the return of labour force, relevant policies can also be formulated to give more favorable conditions to the inflow of labour force from other provinces, such as housing subsidies,so as to achieve the goal of narrowing the regional economic development gap.

References

[1] Liang Hui. (2011) Study on The Relationship Between Labour Mobility and Interregional Economic Gap. China Urban Economy, 11, 69.

[2] Zhou Guangxia, Lin Lefen. (2018) Rural-Urban Migration and China's Income Gap Between Cities: Based on Agglomeration Economy. Journal of Nanjing Agricultural University (Social Sciences Edition), 1, 137-148.

[3] Li Daoqing, Chen En. (2009) Analysis on The Influence of Labor Flow on The Regional Gap of Economic Growth in Guangdong. Journal of Industrial Technological Economics, 12, 126-131.

[4] Fan Shide, Jiang Debo. (2011) Research on Kuznets Effect of Labour Mobility and Regional Economic Growth Gap. Chinese Journal of Population Science, 2, 27-38.

[5] Guo Jiang, Tan Mei. (2018) Research on the Impact of Labor Mobility on Regional Economic Growth Gap. Technology and Innovation Management, 2, 185-189.

[6] Cui Donghua. (2015) Regional Economic Impact Analysis of Inter-provincial Labor Mobility. Tianjin University of Finance and Economics, 1-54.

[7] Ma Jiao. (2013) The Impact of Labor Mobility on Regional Economic Disparity in Hubei Province. Hubei University, 1-56.

[8] Liu Huizheng, Wang Lina. (2016) The Effects of Labor Mobility on Beijing-Tianjin-Hebei Regional Economic Development. Population & Economics, 2, 10-20.

[9] Zhang Wei. (2007)An Experiential and Theoretical Analysis of Labor Migration and Regional Economic Disparity. Xibei University, 1-50.

[10]Wen Huili. (2017) Analysis of Labor Mobility on The Impact of Regional Economic Disparity in China. Xinjiang University, 1-61.

[11]Huang Dunping. (2015)The Empirical Analysis of China’s Labor Flow Impact on The Economic Development Gap. Jilin University, 1-148.