The Impact of Inter-regional Labor Migration on Economic Growth and Regional Disparity

(draft)

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Based on the China Regional Input-Output tables 2002 and other data from various sources, a 30 regions recursive dynamic computable general equilibrium model (CGE) was constructed to study the effect of inter-regional labor migration in China. This model has taken into account of many characteristics of migration in China, such as wage gap between migration and local workers, population migration lagged behind labor migration, large amount of cash transfer and so on. The simulation results show that inter-regional labor migration has little effect on the evolution of regional disparity of per capita GDP mainly due to the effect of "capital-chasing-labor". However, we do find that regional disparity of per capita consumption decreased with the increasing number of interreginal migration. We can show that this is mainly due to the special migration characteristics of large scale of cash transfer between emigration and immigration regions. This result is different much from many empirical studies of China's labor migration, most of which argue that inter-region migration in China will contribute much to the convergence of regional economy, but it do consistent with some theory models and consistent with the evolution of China regional disparity.

Key words: Labor migration, CGE, Convergence, Regional disparity

I. Introduction

China's economy has been growing rapidly since 1990s, but the gradual widening of China's urban-rural gap and regional disparity has attracted millions of rural laborers migrating from rural to urban areas and from less developed to developed areas, which is called the phenomenon of "floating population". It's estimated that the number of rural labor employed by local TVEs hit about 80 million, and the number of rural out-migrants approximately 120 million in 2004, among which about 60 million people migrate across provinces. The number of China's rural migrants has been increasing by 6 million to 8 million annually since 2000. [②] The large scale of labor migration can have important implications for China's economic and social development. This paper will discuss the

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② See *Survey Report on China Rural Migrants* (Research Division of the State Council, 2006).

impact of inter-regional labor migration on regional disparity.

In terms of international experiences, no common conclusions have been reached by scholars concerning the impact of inter-regional labor migration on regional disparity. The neoclassical economic growth model by Braun (1993) deems that labor migration can reduce the growth rate of population in less developed regions and thus accelerate the economic development of those less developed regions, favoring the reduction of regional disparity. Some other models (such as Taylor and Williamson, 1997) also think that labor migration can help reduce the difference in factor returns among regions and thus narrow regional disparity. The above conclusions are consistent with general economic intuition and thus have been widely recognized. But the empirical research on seven countries including US, Germany, Italy, Spain, France, Japan and UK by Barro and Sala-i-Martin (1995) shows that labor migration has promoted regional economic convergence in some nations while it has widened regional disparity in some other nations, and thus it's uncertain whether labor migration can promote regional economic convergence as a whole. The paradox of theoretical and empirical studies is called "Migration Puzzle" (Shioji, 2001). Scholars (Taylor and Williamson, 1997; Shioji, 2001; Rappaport, 2005) have provided their own explanations for this puzzle, but have not reached any consensus on it.

Most studies maintain that China's inter-regional labor migration can help reduce regional disparity. Fan Gang (1995) shows that by increasing the population of destination regions and reducing that of sending regions, inter-regional labor migration can decrease regional disparity in terms of per capita GDP. Although his method is very illustrative, he doesn't account for the full impact of inter-regional labor migration on the output of labor exporting and sending regions. Yao Zhizhong and Zhou Sufang (2003) employ a partial equilibrium model to show that inter-regional labor migration can equalize factor returns and reduce differences in factor endowment across regions and thus diminish regional disparity. Lin, et al (2004) have conducted a empirical study on the relationship between China's labor migration and regional disparity, and the results show that labor migration is an effective way of reducing regional disparity. Wang Xiaolu and Fan Gang (2004) discover that labor productivity in China's central and western regions will go up with the declining number of laborers due to migration and labor migration can also bring back a large amount of remittances. Their conclusion is that labor migration can help reduce regional disparity. Cai Fang (2005) deems that the relatively small scale of labor migration is the main reason why labor migration cannot reduce urban-rural gap. Liu Chuanjiang and Duan Pingzhong (2005) utilize the annual growth rate of net regional in-migration population and other factors to explain provincial economic growth rates (per capita GDP growth rate) during the period 1978-2003. Their results show that the in-migration of population has statistically significant impact on regional economic development and thus population migration can help reduce regional disparity. Wang Fei (2004) employs a multi-regional CGE model to investigate the impacts of labor migration and show similar

results.

However, most studies mentioned above have almost neglected one important fact – capital is highly mobile within one country. When labor migration happens, marginal output of capital in developed regions is raised and thus capital in less developed regions will also flood into developed regions with the labor flow. Therefore, the economic growth rate of developed regions will be further accelerated. If labor cannot move freely, labor migration will not reduce regional disparity. Actually, if there exists capital externality or people with much higher quality have outmigrated, it is possible that labor migration even widens regional disparity in output. Therefore, it's necessary to further study the relationship between inter-regional labor migration and economic development and regional disparity.

This paper will adopt a China CGE model with 30 regions to investigate the impacts of inter-regional labor migration on regional disparity. The paper proceeds as follows. The second section will introduce equations of the CGE model, including equations concerning labor migration; the third section will illustrate the design of simulation scenarios of the CGE model; the fourth section reports simulation results; the fifth section presents the results of sensitivity analysis and the final section concludes.

II. Description of CGE Model

The CGE model employed in this paper is built on the DRC-CGE model originally developed and maintained by the Development Research Center of the State Council. We add equations concerning inter-regional trade, capital and labor flows into the original model. DRC-CGE models have been used for simulations of China's mid- and long-term economic development and the trend of structural change (Zhai Fan, et al, 1999), analysis of the impact of the entry into WTO on China's economic development (Li Shantong and He Jianwu, 2007), regional economic growth and industrial structural change (Duan Zhigang and Li Shantong, 2004), financial and tax policies (Duan Zhigang, et al, 2005) and the impact of infrastructure construction on poverty reduction (Gao Ying and Li Shantong, 2006).

Main model assumptions

The CGE model in this paper include 30 regions except Tibet in mainland China, which form a unified domestic market by means of inter-regional trade, capital and labor flows, and "Rest of the world" which reflects China's foreign trade.

The production activities are divided into nine sectors, including agriculture, mining, manufacturing, construction, traffic & transport & storage & post, finance & real estate, business & restaurant, social service, government and public organization. [①]Therefore, there are nine products (services) in the economy for each region.

[①] Here the division of sectors is made mainly in terms of the sectoral distribution of China's rural migrants.

The model differentiates two types of capital: new and old. New capital can flow freely and thus has the same yielding rate across the nation (we will account for the uncompletely free capital movement in sensitivity analysis). Old capital is simply assumed to be completely immobile. The annual depreciation rate of old capital is 4% and the current new capital will be turned into old capital in the next year. By differentiating new and old capital, the model can reflect the nonreversibility of investment in some industries in real economy.

There are two types of households – rural and urban households in each region and accordingly labor is divided into agricultural and non-agricultural labor. It's assumed that non-agricultural sectors are all located in cities and thus rural households in rural areas only provide agricultural labor while those migrating to cities provide non-agricultural labor, whose wages are lower than local urban citizens.

There is one local governemt account and one central government account in each region to reflect their income, consumption, saving and inter-government transfer payment. The tax income comes from added value tax, sales tax, other production tax, enterprise profit tax, and household income tax. The tax rates in each region are calculated in terms of the data in 2002 and are assumed to be fixed in the model.

Labor is assumed to be not freely mobile in the model. When there exists certain income gap between two regions, labor migration will happen, but the scale is relatively smaller than in the condition where labor can move freely and thus the wage gap between two regions is eliminated. For the sake of simplicity, here we don't consider labor migration within agricultural sectors.

According to the results of other studies, there are many determinants of labor migration, including social and economic factors, such as income gap, unemployment rate, migration cost and migrant network, and individual demographic factors, such as gender, age and education. Because our goal is not accurately predicting the number of migrants, but studying the impact of the exogenously changed speed of labor migration on economic growth and regional disparity, we don't accurately estimate the number of migrants in the model. For the sake of convenience, we simplify the behaviors of migrants to some degree in the model.

We assume that the number of labor migration from one region to another is determined by: (1) migration cost, (2) expected wage level in the destination region (i.e. urban wage level multiplied by a labor efficiency factor), (3) the number of labor migrating between two regions in the previous period. The migration equation employed in the model is as follows. [①]

[①] The equation is actually a simplification of classical migration equation by Todaro (1969, 1970).

$$Migr_{dr,rg} = \phi_{bm}\psi_{dr,rg}\left(\frac{(\phi_{alsl}-\phi_c)W_{rg,urb}}{W_{dr,rur}}\right)^{\omega^m}\cdot L_{dr,rur}^{s-1} \qquad (1)$$

where $Migr_{dr,rg}$ is the total number of rural migrants from region *dr* to urban region *rg*, $W_{rg,urb}$ is the average wage of non-agricultural labor in region *rg*, $W_{dr,rur}$ is the average wage of agricultural labor in region *dr*, ϕ_{alsl} represents the skill difference between rural migrants and local urban citizens, which is related to the wage gap between them, ϕ_c is related to migration cost, which is proportional to the urban wage, $\psi_{dr,rg}$ is the intensity coefficient of labor migration from region *dr* to region *rg*, which reflects the actual flows of inter-regional labor migration in 2002, $L_{dr,rur}^{s-1}$ is the total number of agricultural labor in region *dr* in the previous period, ω^m is the elasticity concerning the speed of labor migration, ϕ_{bm} is a binary coefficient, with 1 for the condition where net income from migration is greater than income obtained at home, and 0 for otherwise.

The values of ϕ_{alsl} and ϕ_c are specified according to empirical results. Many survey results show that the wage level of rural migrants is only about one half that of local urban labor. [①] Therefore, we assume $\phi_{alsl} = 0.7$ and $\phi_{bmc} = 0.2$. ω^m measures the sensitivity of labor migration speed to wage difference and is assumed to be 0.8. $\psi_{dr,rg}$ is calculated in terms of the actual number of migrants and wage gap.

We divide rural migrants into different sectors in terms of the survey results in 2004[②] and take into account the possibility that non-agricultural labor can move between sectors to some degree.

There still exists surplus labor force in China's rural areas and certain skill difference exists between rural and urban labor. Therefore, in the model we further take into consideration the number of efficient labor. For non-agricultural sectors, one local urban labor is equivalent to one efficient labor while one rural migrant is equivalent to ϕ_{alsl} efficient non-agricultural labor. For agricultural sectors, when the scale of labor migration is relatively small, the number of efficient agricultural labor changes little due to the existence of surplus labor; when the scale of labor migration is relatively large, the number of efficient agricultural labor can be greatly reduced.

Finally, the equilibrium in labor market is determined by the total demand and supply of efficient labor in each region.[③]

1) Population movement

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① For example, *Survey Report on China Rural Migrants* (pp. 12) states that actual work time of rural migrants is more than 1.5 times that of local urban citizens while their monthly wage level is less than 60% of that of their urban counterparts. Their actual wage per hour is only equivalent to one quarter of that of local urban citizens.

② See *Survey Report on China Rural Migrants*, pp. 104.

③ It's assumed that labor supply is unelastic and unemployment is not considered in the model.

One prominent characteristic of China's labor migration is that population movement lags behind labor migration. Some young rural labor migrates out, leaving most of their old parents and children at home. Although the movement of those non-labor population doesn't exert any impact on production in each region, but influences consumption and thus the number of per capita GDP calculated in terms of the total population. According to the survey results, the ratio of family migration has gone up somewhat recently, with that of 20.9% in 2004.[①] Because there is not exact statistic concerning the ratio in 2002 as far as our knowledge goes, we just simply assume it to be 20% in 2002. In addition, the ratio of China's total population to total labor is 1.7045 (1,284.53 million divided by 753.60 million), and we use this ratio to calculate the number of non-labor population movement (0.2*1.7 + 0.8*1 = 1.14, i.e. there is 0.14 non-labor going with one migrating labor).

2) Dynamic link

The model has a recursive dynamic structure, which is reflected by the growth of production factors (labor and capital) and the improvement of TFP. The technological progress is assumed to be Hicks neutral. It's assumed that the production function takes the form of $Y(t) = F\left[ND_t, \lambda_{lt}L(t), \lambda_{kt}K(t)\right]$ in the model, where *ND* is the total intermediate input, λ_{lt} and λ_{kt} are technological progress rates for labor and capital, respectively. But most empirical studies concerning China's economic growth only discuss TFP, and few focuses are laid on technological progress rates for labor and capital.[②] In the model, we simply choose the estimates of Sun Linlin and Ren Ruoen (2005), i.e. $\lambda_{lt} = \lambda_{kt} = 2.53\%$.

3) Macro closure

Macro closure is one important issue in CGE models, which reflects the understanding of CGE models about economic theories and economic structure and involves the choice of exogenous variables in the model. We adopts the principle of neoclassical closure, that is to say, total investment is endogenously determined by the sum of savings of all accounts. The model is savings-driven and all savings are turned into new fixed assets investment in the next period. As for government accounts, the tax rate and expenditure, which is proportional to income, are exogenously determined and the saving is endogenously adjusted. Regarding the macro closure of balance of payments, the inflow of foreign capital is exogenously fixed and the actual exchange rate is endogenously adjusted.

III. Design of simulation scenarios

Compared with comparative static analysis in theoretical models and regression techniques in econometric models, we often design several scenarios in CGE models in accordance with different polices and compare economic results under different scenarios,

① See *Survey Report on China Rural Migrants*, pp. 77.

② For example, Guo Qingwang and Jia Junxue (2005), Guo Qingwang, et al (2005), Yue Shujing and Liu Chaoming (2006), Sun Linlin and Ren Ruoen (2005).

thus knowing the impact of policy changes (or other exogenous shocks) on the economy. The main scenarios in the paper are as follows.

BAU (Business as Usual). The total number of migrants is calculated in terms of actual speed of labor migration in 2002 (See Equation (9)), and new added capital move freely across different regions.

S12. Capital can move freely and the speed of inter-regional labor migration is higher than in BAU. It's assumed that migration cost across regions is somewhat reduced in the next year after the base year, i.e. the coefficient ϕ_c in Equation (9) is changed from 0.2 in the base year to 0 in the following years. Therefore, other things being equal, the number of labor migrating across regions will be larger than in the baseline scenario if the wage difference between two regions remains the same. That is to say, the speed of inter-regional labor migration is quicker than in the baseline scenario.

Actually, the government behaviors can exert great impacts on the scale and speed of labor migration. For example, the government can provide professional skill training programs for rural labor to enhance their skills and thus improve their opportunities of finding jobs in citis and increase their wage levels, all contributing to the acceleration of labor migration. On the other side, the government in destination regions can provide services in lodgings, children education, and law help for rural migrants to reduce their migration cost or enhance their migration benefits, thus promoting labor movement. In the model, we assume that the government takes some measures to decrease labor migration cost and thus the scale of inter-regional migration is relatively larger than in the baseline scenario.

S10. Alternatively, we design this scenario to reflect the slow down of inter-regional labor migration. Under this scenario, it's assumed that the government takes some measures to forbid the new arrival of inter-regional migrants and only permits rural-urban migration within the region, resulting in no new inter-regional migrants.

S2. To account for the impact of labor migration on sending regions, we assume that the speed of labor exporting in Anhui Province is higher than in the baseline scenario while other conditions remain the same as in the baseline scenario.

Table 1 The scenarios design for labor migration

Experiement	Description
	Base conditions for all Scenarios 1. Population growth and composition are exogenous, the growth rate is 1% one year 2. The household and Government saving rate is exogenous 3. The tax rate is fixed equal to the base year

	4. the change of input ratio is exogenous 5. The intra-regional migration parameter,including migration cost and wage elasticity is fixed
BAU	The migration cost and wage elasticity is fixed to the base year
S10	The inter-regional migration is set to zero
S12	The inter-regional migration cost and wage elasticity is increased
S2	The inter-regional migration cost and wage elasticity for Anhui province is increased while that in other regions is fixed as BAU

4. Simulation Result

After the CGE model was constructed and the base data set of Social Accounting Matrix was completed, we can use the model to simulate the economic growth and regional disparity index in every scenario. By comparing these results in different scenarios, we can find the effect of labor migration on economic growth and regional disparity.

Table 2 The migration number in the base case scenariio （units：million person）

	Simulation year						
	1	2	3	6	8	11	13
Inter-province accumulated migration	395	763	1111	2081	2695	3592	4179
Intra-Province accumulated migration	465	907	1332	2537	3316	4476	5277
Total migration	860	1669	2443	4618	6011	8067	9456
Added migration in current year (including the intra-province migration)	860	809	774	698	702	679	695

Data source: results from the CGE model

Table 2 shows the main result in the base case scenario[①]。It can be fiound that the number of new added labor migration decrease year after year. In the first year the added labor is 860 million (include the intra-province 465 million migrants). It decreased to 774 million in the third year. The slow down of migration is caused by two factors. First, the surplus labor in the rural region decreased as the rural labor migration to the city continuously. Second, the wage difference between rural and urban regions will be narrowed.

① The poluation growth rate is set to 1% one year，and the ratio of population and labor is assumed fixed in the simulation period.

Figure 1 shows the evolution of per capita GDP and per capita consumption in the base scenario. It can be clearly seen that the regional disparity of per capita GDP doesn't decrease as the number of labor migration increase. This is due to the effect of "capital chasing labor"(Taylor and Williamson，1997), that is to say, as the labor migrate from less developed regions to developed regions, the marginal product of capital in the net immigration regions will be increased because the per capita capital will decrease as a result of increasing labor force, and the marginal product in the net emigration regions will be decreased. As a result, the capital will also migrate from poor regions to rich regions. So this simulation results show that if there is no convergence of production technology, the labor migration alone can not reduce regional disparity.

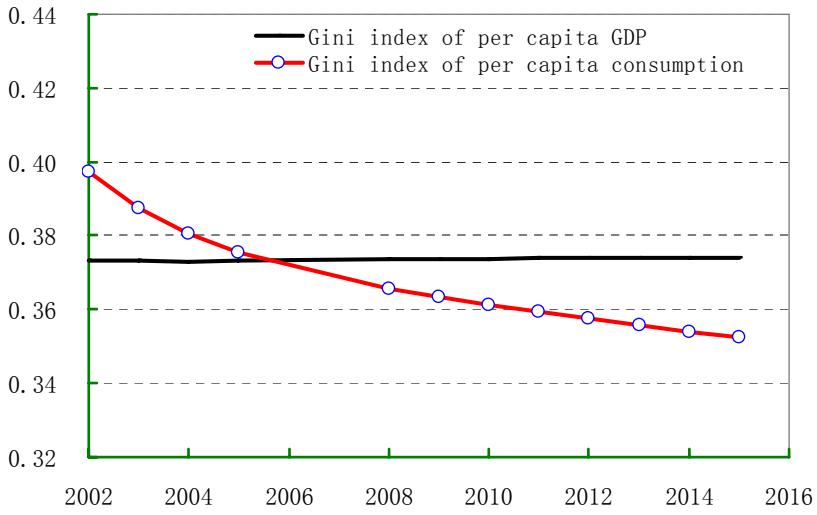

Figure 1 the Gini index of per capita GDP and household consumption in the base scenario①

But the regional disparity of household consumption do reduced significantly as the number of labor migration increased. This is due to the fact that large sum of income transfer from immigration regions to the exmigration regions. In China, Most of rural labor migrate to the cities and find work there, but they can not permantly living in the cities because of many factors, such as low income, no city registration permission, as well as many other restrictions. In fact, the labor migration is not paralleled with population migration in China. In many case the young people migrate to the city but leave their old parents and young childen in the rural place, as a result, many migrate labors will set back most of their earning to the original living rural place. As the income was transferred from rich regions to the poor regions, the per capita income in the rich regions will be lowered while in poor regions will be increased, so labor migration do can reduce the regional disparity of household income and consumption.

① Gini index is calculated by the equation as $G_u = (1/2\bar{y}_u)\cdot 1/[n(n-1)]\sum_{i=1}^{n}\sum_{j=1}^{n}|y_i - y_j|$， where y_i is region *I's percapita* GDP， $\bar{y}_u$ indicates the national average percapita GDP（Simple average, not consider the population weight），*n is the number of region, see* Shankar (2003)。

2．The effect of labor migration to economic growth and regional disparity

Similar to the comparative static analysis in the general economics, we can find the effect of labor migration to regional disparity by comparing the simulation results of base ccenario (BAU) and two other scenario S10 and S12. It can be seen from part 3 that the different within these 3 scenarios lies only in the migration speed and all the other parameters and exogeneous specification are the same. So we can think that the difference of economic growth and regional disparity are mainly because of difference in labor migration.

Table 3 shows change of migration number in the two scenarios and Table 4 gives the economic growth rates in each scenarios. Figure 2 and Figure 3 depicts the change of regional disparity for per capita GDP and per capita consumption. Some results can be seen from these table and figures.

1) Inter-regional labor migration can help to speed up the national economic growth rate.

The GDP growth rate for the total 30 regions is 9.68% in the first year. It will slowed down year by year until 8.21% at the end of simulation year; In the scenario of no inter-regional labor migration (S10), the national economic growth rate will be 9.02% and 7.93% in the first and thirteen year respectively, 0.28 to 0.66 per cent lower compared to that in the base scenario. In the other case, the national GDP growth rate in scenario S12, in which the migration cost was small and migration rate was high, is higher than that in the base scenario. Compared with BAU, The number of labor migration in scenario S12 was 116 million larger and the national GDP growth rate was raised by 0.19 per cent（from 9.68% to 9.87%）。It can be saided from this result that labor migration help to speed up the economic growth rate.

Table 3　Changes of labor migration in comparative scenarios (compared with the base scenario)

scenario	Indices	Simulation years					
		1	3	6	8	11	13
S10	Inter-regional labor migration	0	0	0	0	0	0
S12	Inter-regional labor migration	+116 million（29.3%）	+92.6 million（26.6%）	+75.4 million（24.0%）	+69.6 million（22.9%）	+62.9 million（21.2%）	+59.6 million（20.3%）

Data source: the simulation results from the CGE model

There are two effects which help to accelerate the economic growth rate when the labor migration speeds up. First, the effective labor force will be increase as the labor was reallocated in the whole economy. It was generally believed that it need only 180 million labor in china rural place for plant the land and other agriculture sector, while in fcact there

are more than 340 million labor, so the labor productivity in rural place in very low. When the agriculture labor migrate to non-agriculture sectors, the negative effects on the production of agriculture goods is little but it really increased the ouput of non-agriculture sector. Second, the labor migration will help to increase the urbanization rate, which is generally thought to be helpful to ghe economic growth as the agglomeration of capial and human resource in the city has some externality effect.

Table 4 national economic growth rate in different scenarios (%)

Scenarios	Simulation years					
	1	3	6	8	11	13
S10 (migration equal 0)	9.02	8.75	8.43	8.26	8.04	7.93
BAU(base scenario)	9.68	9.26	8.83	8.62	8.35	8.21
S12 (Migration speed up)	9.87	9.38	8.90	8.66	8.40	8.25

Data source: the simulation results from the CGE model

2) The effect of inter-regional labor migration on regional disparity (measured by gini index of per capita GDP) is little

It can be seen from Figure 2 that inter-regional labor migration has only very small effect of convergence. Although the regional disparity was smaller in the S10 Scenario compared with BAU, the same is compared with S12 and BAU, the change of regional disparity is very small. For example， the number of labor migration in S12 in the first year is 29.3% higher than in BAU, but the gini index reduced only 0.2% (from 0.373 to 0.372. In fact the Gini index increased from 0.277 to 0.349 during the time of 1990 to 2004，with a average increasing rate of 1.6% per year. This is much larger than the change of gini index in scenario S12. So it can be said the labor migration has little effect on regional disparity.

3) In the specific migration pattern of China, inter-regional labor migration can reduce the regional disparity of household consumption.

Per capita GDP can not actually reflect the relatively change of household income and consumptiondue to income transfer and different saving rate and some other facts. So the change of regional disparity of household consumption, which is closely linked to household welfare level, is also very important. It can be seen from Figure 3 that labor migration can be greatly reduced the regional household consumption disparity. For example, in the first year, the gini index of consumption reduced by 2.45% from last year in scenario BAU. Compared with BAU, the labor migration increased 29.3% in S12, and the gini index lowered by 0.64%。

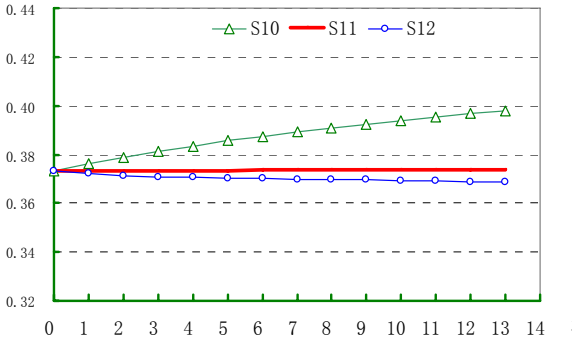

Figure 2 Gini index of per capita GDP

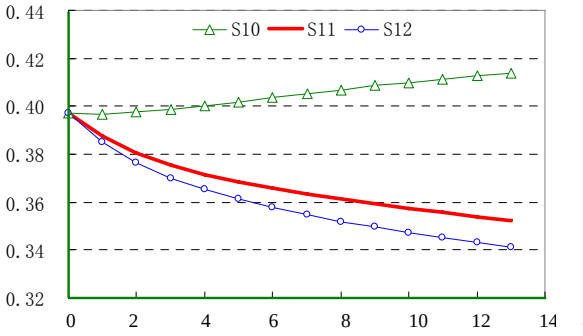

Figure 3 Gini index of per capita consumption

3. The effect of labor migration on the net emigration regions

To see the effect of labor migration on the regional economic growth in net emigration regions, we simulated the results by the example of Anhui Province, which has a lot of surplus rural labor. S2 scenario defines a situation where the Anhui province take a positive plicy to encourage the labor emigration while the other regions remain the migration speed unchanged, this equals to a scenario that the regions compete for labor migration. Table 5 shows the results for Anhui province when the labor emigration rate speeds up.

It can be seen from Table 5 that labor emigration can speed up or slown down the economic growth rate depend on other conditions. Compared by S2 with BAU，the labor emigration increased significantly and the economic growth for Ahui province raised first but decreased later, but the extent is small. This is due to the fact that in the first year there are many surplus rural labor in the rural region of Anhui province, so the negative effect is small and the positive effect dominate the overall effect. As the labor continuously emigrated the total employment in Anhui agriculture sector decreased and the negative effects on the output of agriculture sector become much stronger.

Table 5 simulation result for Anhui Province in scenario S2

Index	Scenario	Simulation years						
		1	2	3	6	8	11	13
Added labor migration in current year (ten thousand)	BAU	43.3	41.1	39.5	36.4	35.2	34.2	33.7
	S2	56.3 (+30.1%)	52.9 (+28.6%)	50.2 (+27.2%)	45.1 (+23.7%)	42.9 (+21.8%)	40.8 (+19.6%)	39.9 (+18.3%)
GDPgrowth rate (%)	BAU	8.03	7.84	7.70	7.41	7.28	7.16	7.10
	S2	8.07 (+0.5%)	7.84 (-0.1%)	7.66 (-0.5%)	7.34 (-1.0%)	7.20 (-1.1%)	7.08 (-1.1%)	7.02 (-1.1%)
Growth rate of per capita GDP(%)	BAU	7.80	7.57	7.38	7.01	6.84	6.66	6.54
	S2	8.10 (+3.8%)	7.80 (+3.0%)	7.56 (+2.4%)	7.10 (+1.3%)	6.90 (+0.9%)	6.70 (+0.6%)	6.61 (+0.5%)
Growth rate of	BAU	10.38	9.55	8.95	7.84	7.40	6.95	6.75

per capita household income (%)	S2	11.29 (+8.7%)	10.25 (+7.3%)	9.51 (+6.2%)	8.16 (+4.2%)	7.64 (+3.3%)	7.12 (+2.4%)	6.88 (+1.9%)
Growth rate of	BAU	9.61	8.91	8.41	7.51	7.16	6.82	6.66
per capita consumption(%)	S2	10.41 (+8.3%)	9.52 (+6.9%)	8.90 (+5.8%)	7.79 (+3.7%)	7.37 (+2.8%)	6.96 (+2.0%)	6.76 (+1.6%)

Data source: the simulation results from the CGE model

Labor emigration help to raise the growth rate of per capita GDP due to the decrease of labor and population, improving of indusry structue and raise of total efficiency. It can be seen from Table 5 that the per capita GDP growth rate enhance 3.8% compared with the BAU when the labor emigration from Anhui province increased by 30% (130 thousand, 0.57% of total Anhui rural labor).

Finally, Labor emigration can significantly increase the growth rate of per capita income and per capita consumption. On one side, the emigrant take back much of the non-agriculture earnings, this increase the household income directly. On the other side, the wage in rural areas will increased as the labor emigration and total number of labor engaged in agriculture decreased.

V. Conclusion

In accordance with the above analyses, we can get the conclusions as follows:

For the total country, inter-regional labor migration can great improve the allocative efficiency of labor, so the economic growth rate can be raised and the regional disparity of per capita consumption can be reduced. Also the income of rural farmers can be raised significantly. As a result, the rural-urban income disparity can be reduced. So it is important to release the obstacle of labor migration, to encourage the development of labor market, and encourage inter-regional labor migration.

The simulation results also show that, without convergence of technology, the regional disparity of per capita GDP can not be reduced automatically due to the inter-regional labor migration. It is important to note that labor migration can not solve the problem of regional disparity by itself. The main reason is that in the case of high level of market integration, the capital will move accompany with labor migration. Because this effect of “Capital Chasing Labor”, the economy growth rate in the labor immigration region will higher than the labor emigration region. Another reason is that the emigrant is always the one with highest education and skill, so labor emigration lower down the skill level of the agriculture labor. But in the case of China, where there is still overabundance of agriculture labor and emigrant transfer much of their earnings to original living place, the inter-regional labor

migration can reduce the regional disparity of per capita income and per capita consumption.

For the net emigration regions, the rural farmer's household income and consumption can be greatly improved because of income transfer from the emigrants, so the government should take effective policy to encourage the overabundance agriculture labor to find work in other place. But the simulation results also find that the pure labor emigration can not reduce the disparity of regional per capita output, in fact, it may even have harmful effect on local economy because of emigration of high quality labors. It can be concluded that the less developed regions should pay much attention to the labor emigration as well as improve the investment environment, encouring the emigrants to invest in local regions when they have earned money and get some technology. It is crucial for the less developed regions to take advantage of labor migration and high liquity of information to improve the human capital and technology level, to reduce the disparity with developed regions and realizing the coordinate regional development.

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