Labor Migration as A New Determinant of Income Growth in Rural China

1. Introduction

In the pursuit of economic growth and modernization in China in the 1990s, the poverty-riddled interior was largely ignored in favor of the rapidly growing coastal regions. Only the magnified burdens on farmers captured the media's attention. Rural income growth has recently become the top priority in China for one simple reason: the goal of modernization can hardly be achieved without *substantially* raising the living standard of the hundreds of millions of people residing in rural areas. The task is daunting, however, given the size of the rural population and the unimaginable levels of poverty in the interior and remote regions. The slowdown of the two growth engines for the rural sector has made the task even more difficult. Farm production, which was the main contributor to growth in the early 1980s, has reached its highest levels. Township and Village Enterprises (TVEs), which were booming and absorbed one hundred and twenty surplus rural workers in the late 1980s and early 1990s, are striving to survive because of the fierce competition.

By contrast, migration from the rural areas to the coastal areas has been rising from a few million in the mid-1980s to an unprecedented level of **100 million** recently. The remittances from the migrants amount to trillions of Yuan annually. This rise and the impressive magnitude of migration in China have stimulated increasing research efforts in recent years, particularly on the trends of migration (Chan and Hu, 2003; Liang and Ma, 2004), gender and migration (Fan, 2003; Roberts, 2002), and return migration (Ma, 2001, 2002; Murphy, 1999, 2000; Zhao, 2002).

At the community level, the common perception, however, has been generally pessimistic about the significance of migration on the development of source communities. The loss-of-labor effect of migration is termed as "the army of the seniors, women and children"left in the home villages (*993861 bi dui*). Consequently, migration has been blamed for land left unfarmed and the reduction of farm production. Remittances to the source communities are often conceived as a means for weddings and housing construction. Some researchers even argue that migration creates a state of dependency on labor income and hence undermines the prospects for local economic development. In a recent study on migration and income in the source communities in Hebei and Liaoning in China, Taylor et al. (2003) looked at the effects of labor migration and remittances on household farm production and income. They found that remittances can partially compensate for the loss-of-labor effect and that they enhanced household income in general.

Focusing on the community level, this paper moves one-step forward in understanding labor migration in China by studying the impact of labor migration on the income growth of rural communities in a multivariate framework. The main questions to be answered include whether labor migration depletes local human resources, reduces local agricultural production and hence retards local development, or has it become a new mechanism of poverty relief, a determinant of rural income, and hence a new growth point in the rural economy. Using various theoretical perspectives, we evaluate the impact of labor migration on rural income growth in Section 2 and introduce the data and methodology in Section 3. The main results are presented in Section 4 and the main findings are discussed in Section 5.

2. Theoretical Perspectives the Impact of Migration on Source Communities

The conventional framework of migration assumes that the individual is the unit of migration and focuses on the labor effects of migration; including the loss-of-labor effect and the selectivity of migration. In Lewis' classical model of economic growth (1954), labor migration by surplus rural laborers to the urban sector has no effect on the total farm production. Once the surplus labor is exhausted, however, the impact turns to negative. In the neoclassical world, rural out-migration reduces the local supply of labor and shifts wages upward. Excessive rural-to-urban migration in response to expected urban income has dual negative effects on urban unemployment and farm production (Todaro, 1969). Labor migration not only reduces quantity but it also lowers the quality of the labor force. Viewing migration as an investment in human capital, neoclassical theory posits that migration is selective of the young and educated whose return to migration is relatively high. The severe loss of human capital or the brain drain may lead to the worst scenario, termed cumulative causation (Myrdal, 1954): the departure of the young (male) and educated reduces the overall attractiveness of the local economy and hence induces further rounds of migration. In general, the conventional framework, which focuses on the labor effects of migration, predicts an increasingly negative impact of labor migration.

A new theory of labor migration, which assumes the incompleteness of markets and the family as the decision unit of migration in developing countries, views migration as a familial strategy to spread the risks between the urban and rural sectors and focuses on the functions of remittances in smoothing family consumption and financing

household investments (Stark, 1990; Taylor et al., 1996). The loss-of-labor effect can be partially compensated for through purchasing seeds and fertilizer, hiring part-time labor, and/or using mechanical power. Once the risk and capital constraints are overcome, the family will change its mode of production by specializing in farm production (i.e., raising livestock) or forming their own businesses. Migrants may return to set up businesses, using their local social capital (Ma, 2002).

The prediction of the positive impact of migration on farm production and income growth in the source communities is in sharp contrast with the pessimistic view from the conventional framework. Because of the productive use of remittances, a sharp reduction in farm production is unlikely in migrant communities. Commercial farm production with higher returns is likely to grow faster in migrant communities. Labor migration can facilitate rural income growth through remittances and productive investments.

3. Data and Methodology

One of the main advantages of using Chinese data for the study is the distinction made between **permanent migration**, which includes an official change of household registration (*hukou*) to the destination, and **temporary migration**, which does not include this official change. In China's 2000 census, temporary migrants are defined as those who left their place of household registration (street/town/township) for six months or more. Permanent and temporary migration are different mechanisms of population redistribution in China. Permanent migration mostly relates to formal employment and family relocation, while a vast majority of temporary migration has been for labor migration from rural to urban areas.

Such a distinction allows us to exclude permanent migration and focus on the impact of labor migration on the rural source communities. To conduct a systematic study of the impact, we select the following data at the county level: (1) census information on the gender and the number of temporary migrants who have left the current *hukou* place, population size by gender and age, and distribution of the labor force by industry, which allow us to compute the total population and rate of out-migration, the gender ratio of the labor force, the dependents ratio, and the labor force share in the secondary and tertiary industries; and (2) published rural county statistics, such as cultivatable land area and time-series statistics on farm production, per capita income/saving, and the proportion of middle-school students, which allow us to compute the growth rates of farm production, per capita income and savings, and the number of people with middle-school education in the 1990s.

Temporary labor migration has increased rapidly since the mid-1980s and has become the main mechanism of population redistribution in China. In the 1990s, cross-county temporary migration nearly quadrupled from slightly over twenty million in 1990 to 78 million in 2000, according to the 1990 and 2000 censuses. In Figure 1, we map the distribution of migrants by county. This map shows that temporary migration has become prevalent in many regions: the minority regions in the north part of China including Neimong, Xinjiang, and Ninxia, rapidly developed coastal regions including Guangdong, Fujian, and Zhejiang, and the interior provinces including Sichuan, Chongqing, Hubei, Henan, Anhui, Hunan, Jiangxi, Hainan and Guangxi. In these regions, it is not surprising to find counties with a rate of temporary migration exceeding ten or even fifteen percent of the total population. There are two main regional differences. In terms of types of

migration, *labor* is the principal reason for migration for a vast majority of temporary migrants originating from the interior, whereas the reasons for migration are more diversified in the nomadic and coastal regions. In terms of distance, the majority of migrants originating from the interior crossed provincial boundaries and headed to the coastal regions, while migrants originating from the minority and coastal regions largely moved within their own provinces, either to another county (city) or to another town (township or street in large cities) in the same county (city). In terms of sending inter-provincial migrants, the top four provinces were the following provinces: Sichuan (6.94 million), Anhui (4.33 million), Hunan (4.31 million), Jiangxi (3.68 million). They are all large agricultural provinces in shortage of land and have relatively long histories of migration starting from the mid-1980s. Thus, the lagged effects of migration can be more revealing in these four provinces than in others. In our analysis, we make a clear distinction between the study region, provinces other than the study region and the country as a whole.

4. Demographic vs. Economic Impacts of Temporary Migration

4.1 Demographic Impact

In general, labor migration in China remained highly selective in the 1990s. The age selectivity of migration was as strong as it was in the early periods, selecting primarily young and middle-aged adults. The age distribution in 2000 was as the follows: 9.3 percent were young dependents (age<15), 57.2 percent were young adults (15-29), 25.0 percent were middle-aged adults (30-44), 6.0 percent were older adults (aged 45-59), and 2.5 percent were older dependents. Consequently, as shown in Figure 2.1, the share

of elderly dependents in the total population increased from 4.7% to around 7.5% as the migration rate increased from less than two percent to around fifteen percent. In some migration communities, this share exceeded 8.5 percent. Figure 2.2 shows that the average size of the family is reduced as the young member(s) move away. Family size declined initially from 4.4 to 3.6 as the migration rate increased to around five percent but leveled off thereafter. Correspondingly, the share of three-generation families declined from 27 to 23 percent initially and leveled off.

The education selectivity of migration has become increasingly strong, as the primary objectives of migration have shifted from "earning income for marriage and housing" (*zhen qian*) in the later 1980s to "broadening experience" (*jian shi mian*) and "learning skills" (*xue ben shi*). A vast majority of temporary migrants had education levels of middle or high school. Among the inter-county temporary migrants, the level of education was distributed as follows: primary school or below (25.8%), middle school (51.5%), high school (17.3%), and college/university (5.4%). The distribution in 1990 was 42.7%, 43.3%, 11.7%, and 2.36%, correspondingly. In general, male migrants were been more educated than their female counterparts. The consequences are not as serious as those of a classic brain drain. Financed by remittances, children's education improved in source communities than in communities with little or no out-migration. Our data shows that the ratio of middle or high school students was higher in migration communities. Return migration (Ma, 2000, 2002) can bring back new skills and ideas from the cities.

However, migration has become less selective of males, partly because of the increasing share of migration by young married couples and partly because of the

increasing demand for young female laborers in the destinations (e.g., Guangdong). Figure 2.3 shows that the ratio of male migrants declines as the rate of migration increases. The ratio of male to female migrants in 2000 was around 115 in the study region, other provinces and the county as a whole. In Anhui, it declined from over 230 in the mid-1990s to 135 in 2000. As a result, the share of male migrants dropped from over 70 to 57.4 percent. Equal shares of male and female migrants were found in the sending provinces of Hunan and Southeast Jiangxi as well as in the destination province of Guangdong. The gender ratio varied by age in Guangdong, at 67.2 males to females among young adult migrants aged between 15 and 24 but 136.9 males to females among those aged 25 to 64.

In general, in addition to the rising rate, temporary migration in China became less selective of males than earlier periods, remained highly selective of the young and middle-aged adults, and became more selective of those with a good education. While the departure of the young member(s) reduced household size, it increased the share of (old) dependents; which might in turn affect local economic growth. Because of the remittances, however, we do observe considerable improvement in children's education, housing and hygiene conditions in source communities. Our data show that the average floor space and the share of households with kitchens, bath facilities, and lavatories increased with an increase in migration.

4.2. Impact on Farm Production

Figure 2.4 shows clearly that the importance of the agricultural labor force declined as the rate of migration increased in the study region. However, farm production

was unaffected or even grew there (Figure 3). First, total grain production neither grew nor declined in the 1990s. Its annual growth rate in general was not affected by migration. The grain production per farmer increased considerably with migration, indicating that productivity increased with migration. In migration communities, young and middle-aged females and old-aged adults are now the primary labor force for farming, helped by teenage children and the young elderly. With remittances, households can share labor, rent land out, hire part-time labor, and/or pay for the use of mechanical equipment.

Second, regardless of the rate of migration, meat production grew rapidly in migration communities at an annual rate above eight percent per year. Regional growth patterns demonstrate that the growth potential was very fast (>15%) in the plateau and low-elevation areas (i.e., Northern Anhui, upper south Hunan), fast (>10%) in hilly areas, but slow in mountainous regions (i.e., West and South of Anhui, most part of Jiangxi). The above findings render support for new theories economics on the labor migration that remittances help to finance production with a relatively high return.

4.3. Impact of Migration on Rural Income Growth

Figure 4 shows clearly that per capita net income and savings grew more rapidly in areas with higher migration rates. In migration regions, labor income grew rapidly, largely because of growing migration and remittances. To study further the effect of migration on rural income growth, we use a multivariate framework, regressing the mean annual growth rate of rural net income on the rate of migration (log) and the provincial growth rate of migration between 1995 and 2000, controlling for other factors such as age

and gender of the population (gender ratio of the labor force and total dependent ratio), initial economic conditions (per capita rural net income in 1992 and poverty levels, farm land per capita and the growth of grain and meat production, and the composition of the labor force in the second and tertiary industries. The results are shown in Table 1. The adjusted R square is 0.37, indicating that the above-mentioned variables explain forty percent of variation of the rural income growth in China.

Our major finding is that migration strongly enhanced rural income growth. The effect is positive and highly significant. The coefficient (log) of the out-migration rate, 4.60636, indicates that 1 percent of migration created 4.6 percent of income growth annually. In addition, the growth variable of migration was also positively significant, indicating that rural income grew faster in provinces with rapid growth of migration. Turning to the control variables, we found that the growth of grain production was negatively related to income growth although the effect was insignificant, partly reflecting the decreasing return to grain products. By contrast, meat production significantly enhanced rural income. The coefficient of the variable, 1.4119, indicates that one percent growth of meat production created 1.4 percent growth of rural net income. The results are helpful in explaining why grain production remained unchanged while meat production grew rapidly in the study region between 1992 and 2000.

By contrast, the effects of the changing demographic composition were either insignificant (in the case of the gender ratio in the labor force) or weak (in the case of the total dependent ratio). Initial conditions were, however, important. Income grew less rapidly in both initially well-off areas and extremely poor counties. The industrial

composition of the labor force was also important: income grew more rapidly in areas with a higher share of the labor force in secondary industries.

4.4 Regional Patterns of Rural Income Growth

Net income in rural areas can be decomposed into major categories: household farming income, household non-farming income, labor wages, and other income. Labor income can be further decomposed into salaries for local cadres and teachers, wages from local TVEs, wages/remittances from migration, and other labor income. The growth pattern of rural income is shown in Figure 5. The main contrast is between the coastal regions, which have spearheaded the country's development and rely on rural industrialization for rural development, and the large interior land, which has increasingly relied on migration income to sustain the growth of rural income.

In the 1990s, the share of labor income in the total rural net income increased rapidly from 20.2 percent in 1990 to 31.2 percent in 2000. The importance of labor income from migration has been growing rapidly since the late 1980s. In 2000, labor income from migration alone accounted for a significant portion of total income in a dozen provinces including: Jianxi (25%), Chongqing and Hunan (all around 20%), Sichuan (17.2%), Anhui (16.2%), Guangxi (14.8%), Hubei (12.1 %), Qinhai (12.3%), Henan (11.5%), Shannxi (11.5%) and Hebei (10.0%). Except in Qinhai, labor income from migration was the major source of labor income in the above-mentioned provinces and much more important than the labor income from TVEs, which accounted for less than twenty percent of the total labor income. Jiangxi is an extreme case in which the share of income from migration in the total labor income was 71.5 percent, in sharp

contrast to only 6.2% from TVEs. By contrast, wages from local TVEs were the major source of labor income in most coastal provinces. Guangdong is the exception in that its share of migration income (53.5%) is greater than that from TVEs (28.4%). Income from migration accounted for significant portion of labor income (20~43%) in three other coastal provinces: Jiangsu, Shandong and Fujian (23.9%), and in a vast majority of remote provinces except for Xingjing and Xizhang.

6. Discussion

What we found in China is quite contrary to the predictions of conventional thinking that migration reduces the quantity and quality of the rural labor force, jeopardizes farm production, and hence undermines local development. Whereas the departure of the educated youth reduced the share of the agricultural labor force and increased the (old) dependent ratio, the loss-of-labor effect on farming was negligible: grain production remained unchanged and meat production grew rapidly in the migration regions in the 1990s.

Our multivariate analysis shows that migration was a significant contributor to rural income growth in source communities. One percent of migration has brought about four percent of income growth annually to these areas. Grain production, which was emphasized by the government as an important stabilizing force in the country, was negatively related to income growth although the effect was insignificant. By contrast, meat production significantly enhanced rural income and hence grew rapidly in migration regions in the 1990s. The growth of farm products is closely linked to their returns. In understanding the stagnant grain production in migration communities in 1990s, the

decreasing return to grain production in the later 1990s is perhaps a more important factor than migration. The above findings render strong support for the new theory of migration, which predicts that migration can enhance rural household income directly through remittances and indirectly through productive use of remittances in farm production and business formation.

The conventional wisdom, which predicts that migration increases the dependent ratio and hence slows down local development, does not seem to apply to contemporary China. The effect of the dependent ratio on rural income growth was negative but barely significant, while the effect of the gender ratio in the labor force was insignificant. Migration has become less selective of males in China, partly because of rising demand for young female laborers and partly because of the formed migrant networks. Migrants' expectation of staying in the cities for an extended period of time is also an important reason why migration now increasingly involves couples and even entire nucleus families. This trend is likely to increase when cities become even more hospitable to migrants in the future. With the departure of the young people, elderly care in migration regions becomes an interesting topic of future study.

In our model, rural industrialization remains an important contributor to rural income growth. In our regional analysis of rural income, we evaluate and make comparisons between the contributions of migration and rural industries. As the main sources of labor income, income from migration is primary and more important than income from rural industries in the interior regions, whereas the opposite is true in the coastal regions. Thus, the model of "leaving the farmland without leaving the

countryside", which has been effective in developed coastal regions, is less applicable to the vast interior area and remote regions.

Our conclusion is that labor migration has become a new growth point in China, contributing greatly to income growth in the interior and hence to the reduction of regional inequalities. It is groundless to blame labor migration for causing reductions in farm production. Our findings have important policy implications. Migration is an effective means of poverty relief and rural transformation. As a temporary solution to rural development, migration is perhaps more effective than rural industrialization in less developed regions. Future studies should focus on how to sustain rural development in migration regions.

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Table 1. Determinants of Rural Net Income Growth, 92-2000

	Intercept	137.81961	***
Temporary Migration			
	Out-migration rate (log)	**4.60636**	****
	Growth rate (2000/1995)	6.02915	**
Age/Sex Composition			
	Sex ratio of labor force	0.02955	
	Total dependent ratio	-0.18091	*
Initial Economic Condition			
	Net income in 1992 (log)	-19.71502	***
	Poverty county (87)	-5.23801	***
Farm Production			
	Per capita arable land	52.89654	***
	Growth of grain (%/yr)	**-1.23578**	
	Growth of meat (%/yr)	**1.41188**	**
Labor Force Share			
	2nd industry (incl. TVEs)	**0.85563**	****
	3rd industry	-0.71504	**
adj R-square=0.3655			

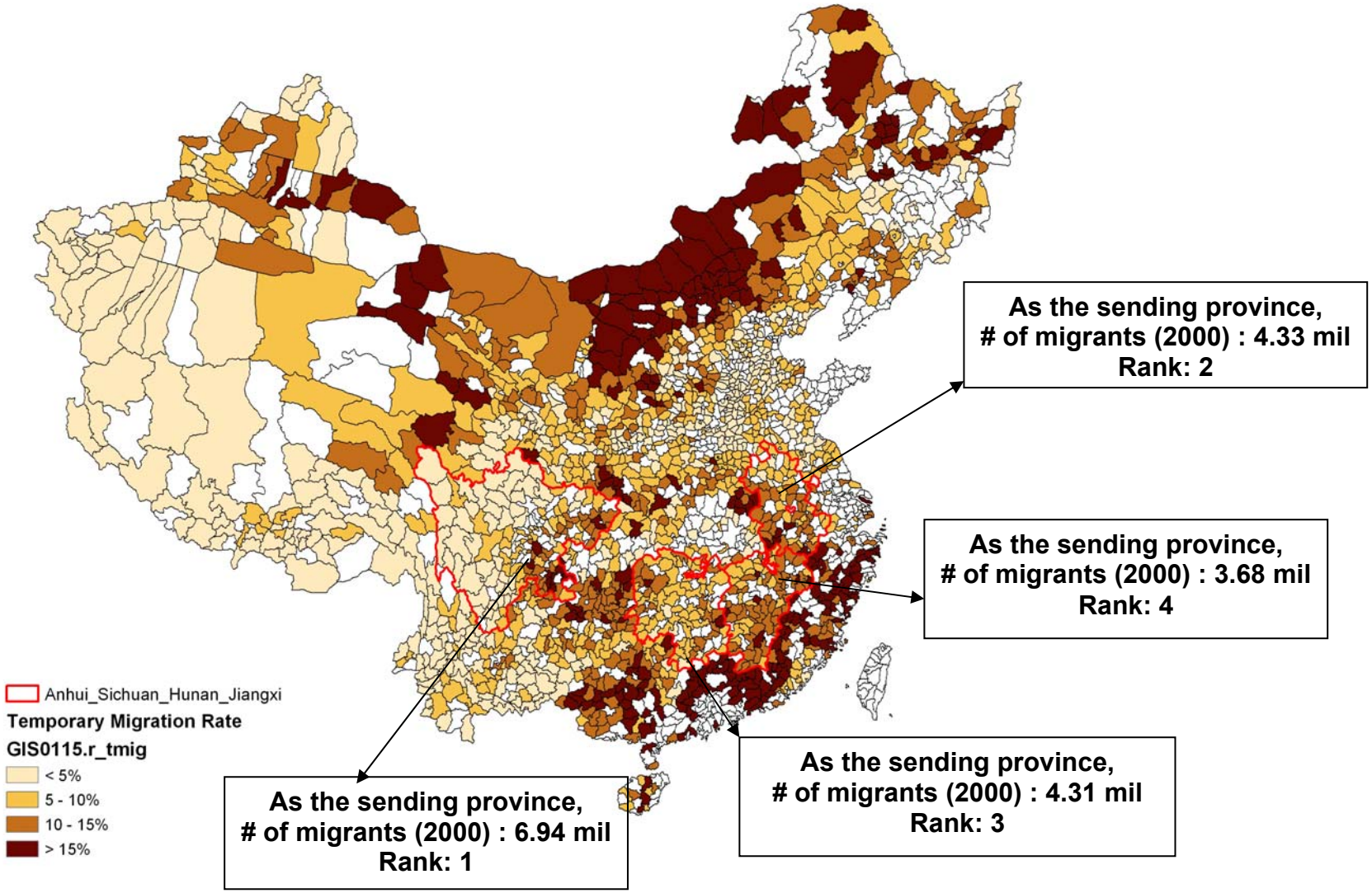


Figure 1. Temporary Migration Rate by County of Origin, China, 2000 (Source: NBS 2000 Census)

Figure 2.1

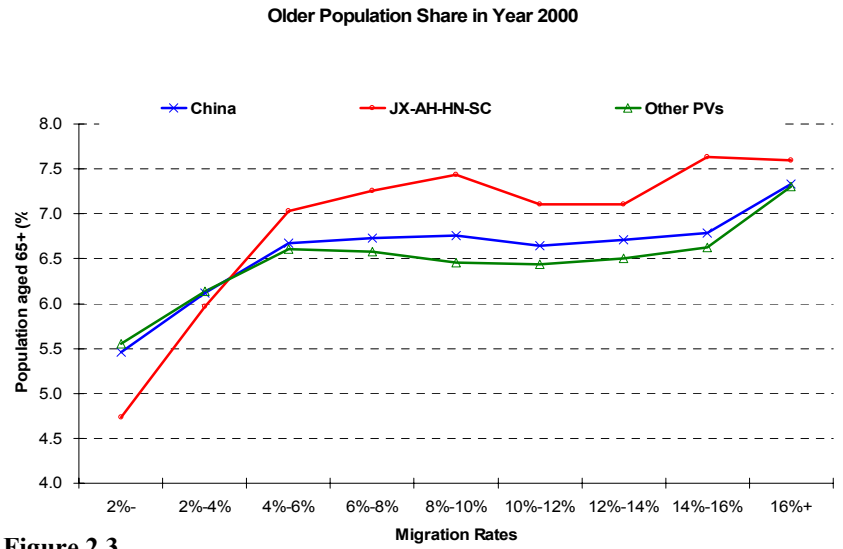
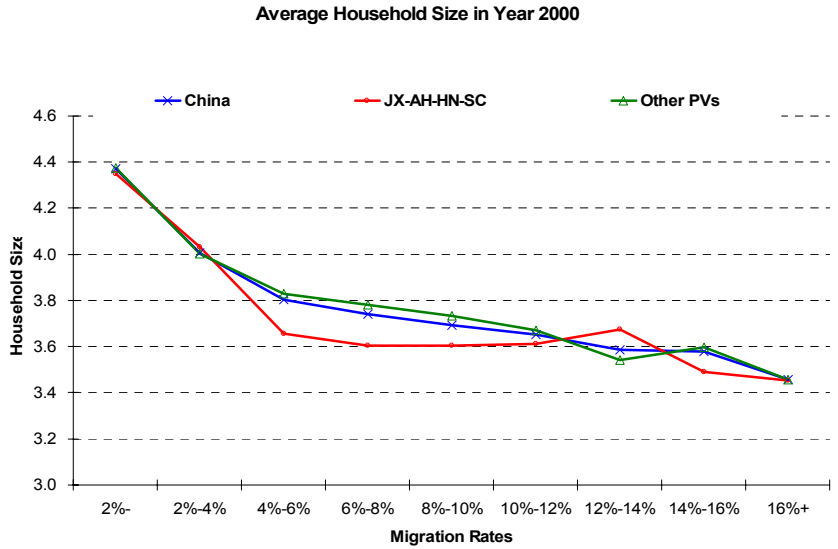


Figure 2.2



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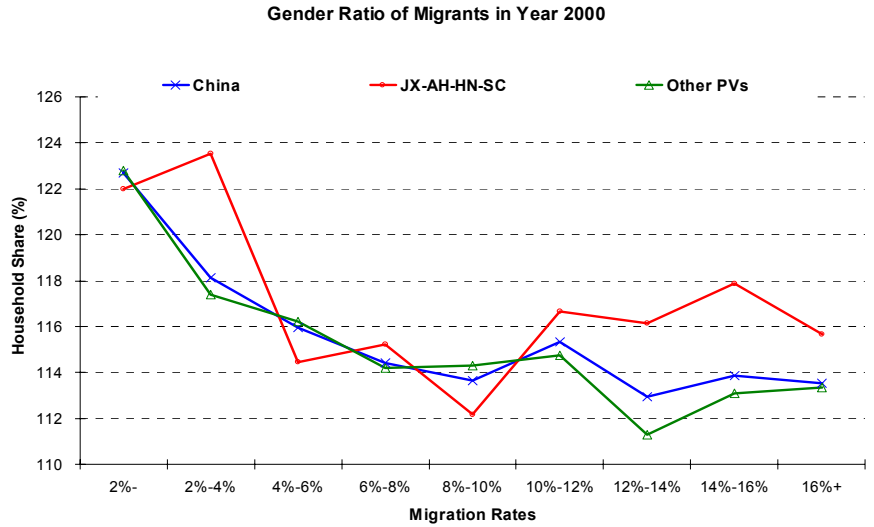


Figure 2.4

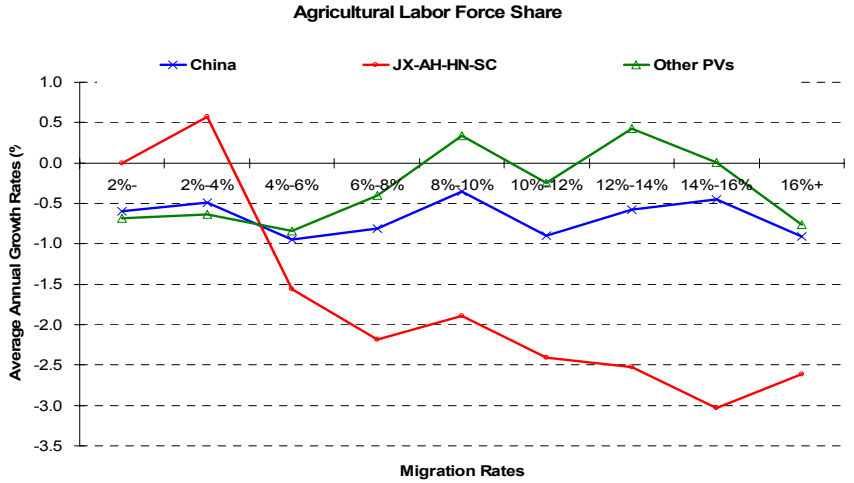
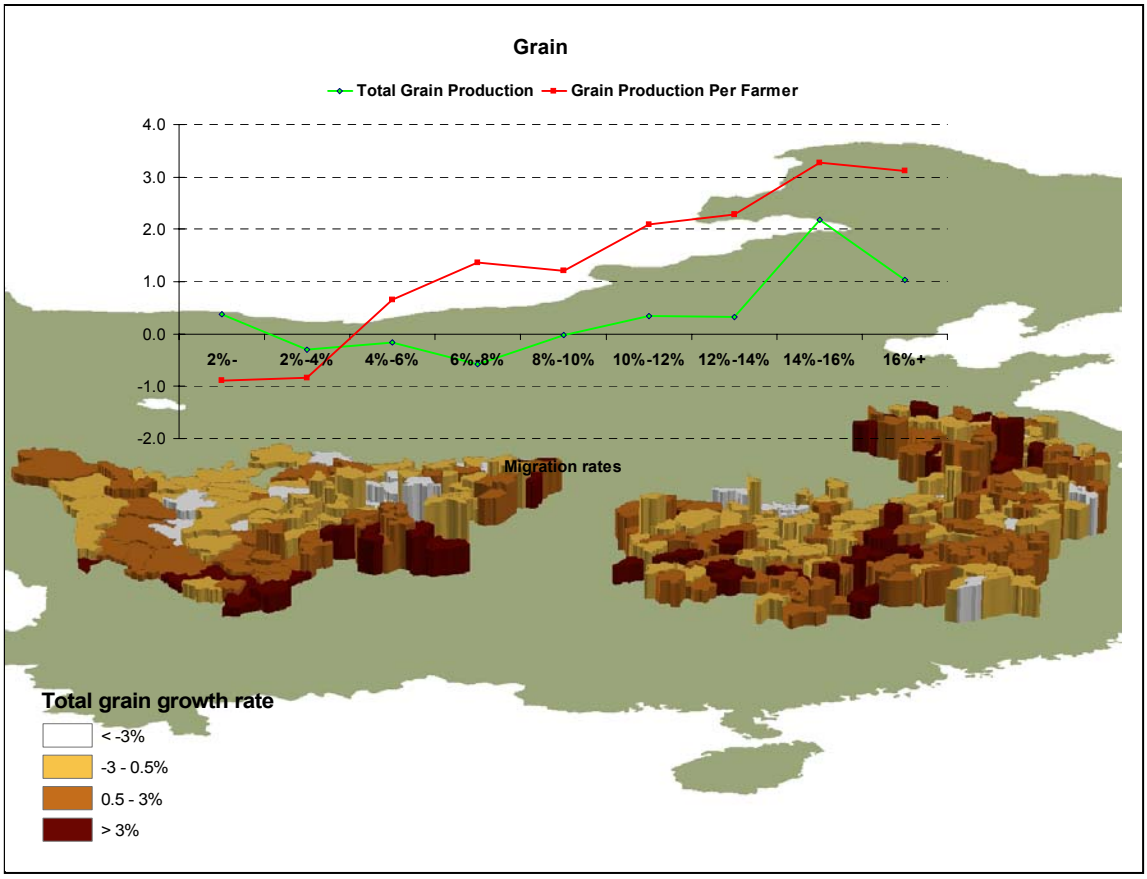


Figure 2. Selectivity of Temporary Migration and its demographic impact on the source communities, China, 2000.



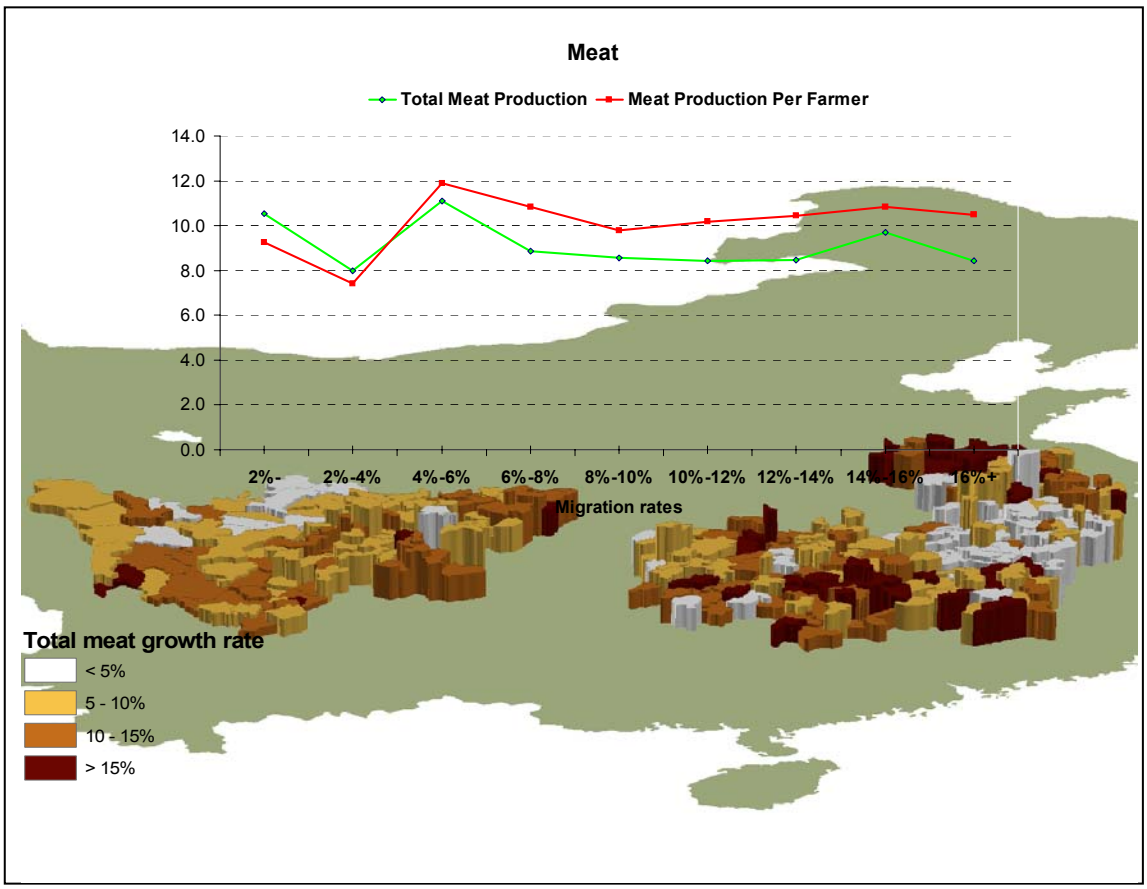


Figure 3. Temporary Migration Impact on Farm Production on source communities, China, 1992-2000.

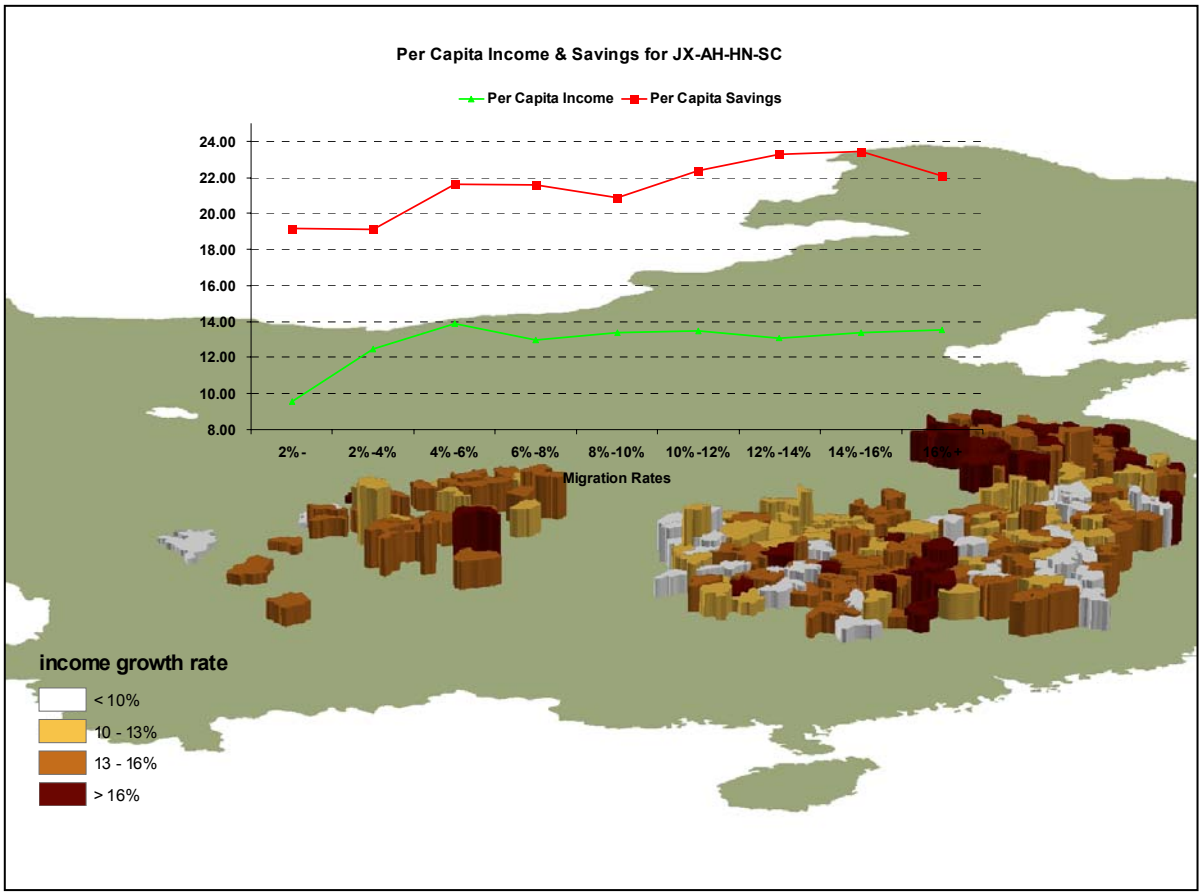


Figure 4. Temporary Migration Impact on Per Capita Income & Saving on source communities, China, 1992-2000.

Figure 5.1

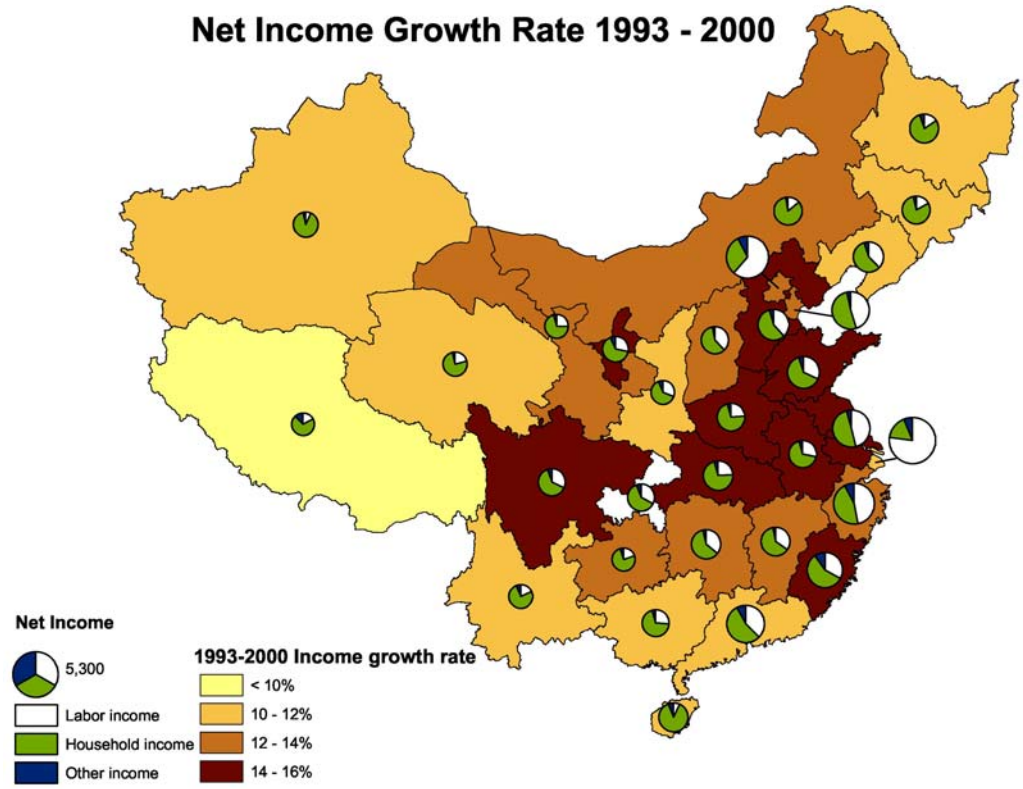


Figure 5.2

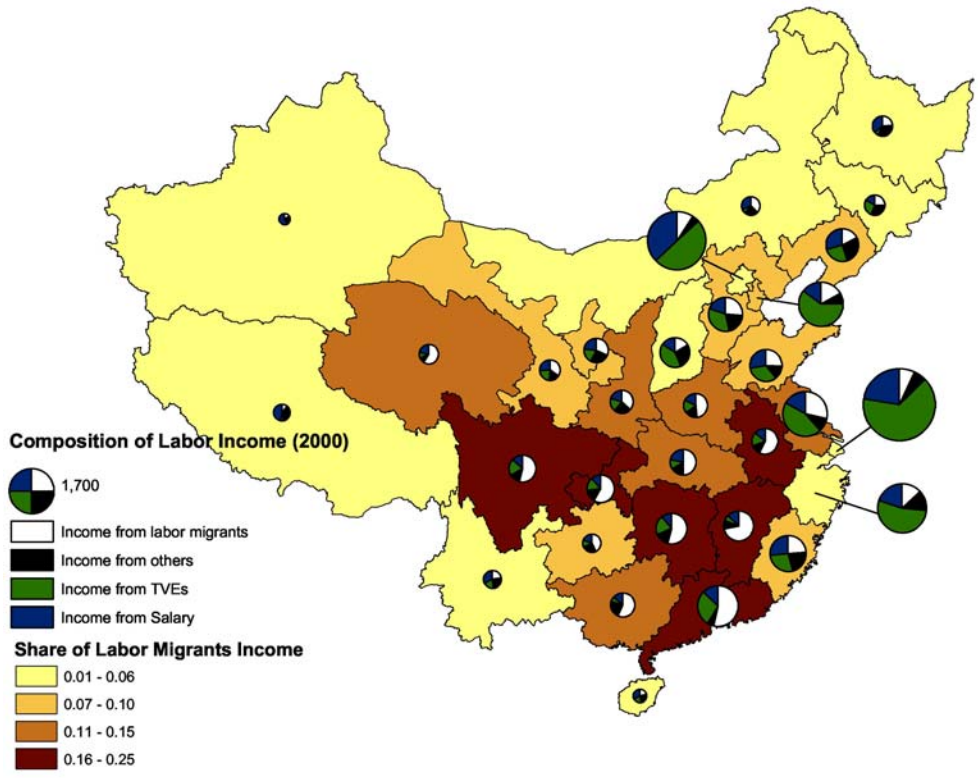


Figure 5. The Importance of Migration in Rural Net Income by province, China, 1993-2000.