*The China Review*, Vol. 3, No. 2 (Fall 2003), 73–93

# *Migration As Marketization: What Can We Learn from China's 2000 Census Data?*

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***Abstract***

Based on the 2000 census data and other relevant data, this paper investigates the spatial pattern and determinants of large-scale migration in China. The *hukou* system segregates rural and urban labour market and makes rural-to-urban migration a unique process in China's economic transition. The empirical results show that the differences in expected income and in extent of marketization between regions are important factors directing the flow of migration. The employment opportunities and availability in urban areas also plays a role in migration decision. The policy implication is that the abolition of the various institutional

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* The authors thank Kam Wing Chan and two anonymous referees for valuable comments and suggestions, but are responsible for all remaining errors.

obstacles that hinder the development of a labour market will not only gain a significant efficiency in resource reallocation, but also normalize migration flows in a rational way.

## Introduction

The massive population flow from rural to urban areas in post-reform China is the result of both institutional changes and structural changes caused by economic growth. In the pre-reform period, the planning system was well established and served as a vehicle for implementing heavy industry-oriented strategy. Capital-intensive heavy industry in a capital-scarce economy could not be built through market forces; instead, a planned mechanism was required, to allocate resources among the various sectors in accordance with government priorities. Therefore it was not necessary, nor was it permitted, for capital, labour and other factors of production to move freely in response to market signals. As this strategy was adopted in the 1950s, capital and labour were firmly restricted by a host of institutions, and could not transfer among sectors, regions or ownerships. Any mobility of factors of production was deemed to be in contravention of the planning system. These restricting institutions include the household registration (or *hukou*) system which divided rural and urban population into separate groups, urban employment policy and urban welfare policy which excluded rural residents from entitlement, the urban rationing system for food and necessities, and an urban-biased social security system. Under the planned system, it was impossible for rural residents to move to the cities without official approval; labour mobility across sectors was planned by departments of labour and personnel, and the existence of a labour market was not permitted.

The HRS (household responsibility system), initiated in the late 1970s, made farm households the residual claimants of their marginal efforts, thus solving the long-standing incentive problems which had been associated with the egalitarian compensation rules of the commune system.[1] At the same time, the price system of agricultural products was reformed, which stimulated an increase in farm productivity, thus releasing surplus labourers from agriculture. The higher returns to labour in non-agricultural sectors motivated farmers to migrate out of agriculture.[2] As the result of labour mobility from agricultural to non-agricultural sectors and from rural to urban areas, labour markets began to develop.

In the early 1980s, when various institutional barriers deterring labour mobility were still in place, the government encouraged rural labourers to "leave the land without leaving the village." Labour mobility was only to mean a movement from farming to employment in township and village enterprises (TVEs). However, having encountered strong competition from state-owned enterprises, joint ventures, and private enterprises since the late 1980s, TVEs were forced to improve the technologies they used, and the quality of their products, by investing more capital rather than employing more labour. As a result, the absorption of labour by TVEs slowed down, pushing rural labourers to migrate across regions. Meanwhile, other non-state sectors, such as foreign and overseas Chinese-invested enterprises, private enterprises and shareholding companies, began to expand in coastal provinces, raising the demand for labour and becoming a driving force to abolish those institutional obstacles deterring labour mobility.

In 1983, observing the reducing capacity of the rural sectors to absorb surplus labour, the government began allowing farmers to engage in long-distance transport and marketing of their products beyond local market places. This was the first time that Chinese farmers had the legitimate right to do business outside their hometowns. In 1984, regulations were further relaxed and farmers were encouraged by the state to work in nearby small towns where emerging TVEs demanded labour. A major policy reform took place in 1984, when the central government allowed farmers to work in enterprises and/or run their own businesses in cities, under the condition of "self-sufficient staples."[3] Since the 1990s, both central and local governments have adopted various measures to encourage labour mobility between rural and urban areas and among regions, gradually relaxing the *hukou* system. For example, cities of various sizes have issued blue-stamp *hukou* identities to those who have migrated there and paid a certain amount of money (or invested in local business or bought an expensive house in the city). Policy changes such as this were a kind of progress, because they maintained a constant population and controlled selective migration, while providing some room for a labour market to develop. In 1998, the Ministry of Public Security issued new regulations loosening control over *hukou* registration. That is, those who join their parents, spouses and children in cities can be registered with an urban *hukou*.[4] The reforms in urban welfare provision have created a necessary institutional climate for rural-to-urban migration. Such reforms include the removal of rationing, the expansion of urban non-state sectors, the housing

distribution system, and changes to employment policies and the social security system. These reforms have made it more feasible for rural labour migrants to make a living in the cities.

Compared to reforms in other fields, migration policies remain little changed, seriously impeding population migration across regions. The *hukou* system is the origin of this, and gives legitimacy to discriminatory policies and regulations against migrants. Two changed conditions motivate the urban governments to reform their migration policies. First, urban *hukou* status no longer contains any explicit or implicit benefits — that is, local governments do not guarantee employment and do not provide any social benefits simply by identifying a person's *hukou* status. In this way, an urban population expansion will not place any extra burden on the government budget. Secondly, urban planners recognize that labour mobility not only brings about resource reallocation, but it also becomes a more important source of urban financing than redistribution. In terms of the above conditions, cities with different levels of marketization have different motives for reforming their *hukou* policies. Those regions which have enjoyed prosperity from international trade expansion and foreign direct investment (FDI) tend to welcome cheaper and more disciplined migrant workers and have gone further in eliminating policies against migration, whereas those regions which have suffered losses from having a heavy share of state-owned enterprises (SOEs), do not.

In short, labour mobility arising from reform of those institutions which deter migration, is not only an important component of economic development, but also a product of the economic transition towards market forces. This transition has been preconditioned by the reforms in a wider sphere. As a result of reform in those areas, the allocation of labour across sectors and among regions is becoming more and more based on market forces. The characteristics of migration in transitional China reflect the characteristics of marketization as a whole. This paper intends to empirically examine the relationship between rural-to-urban migration and overall marketization by using the 2000 census data. Section 2 summarizes theories on migration and their application to the case of China's internal migration. Section 3 maps the regional pattern of migration, picturing its changes over the previous years as markets have matured. Section 4 explains variables used in our empirical work. Section 5 tests our hypothesis on the relationship between migration and marketization against empirical evidence from the 2000 census, and other sources. Section 6 presents our conclusion.

## Migration in Transition: A Theoretical Explanation

Migration is virtually a process which tends towards labour market equilibrium among regions. In the course of economic development, all countries inevitably experience a process of industrialization-cum-urbanization, which requires population migration from rural to urban areas and labour mobility from the lower productivity agricultural sector to the high productivity industrial sector. In Lewis's model there are no institutional hindrances deterring free migration between rural and urban sectors.[5] The difference in wages between agricultural and manufacturing sectors is the driving force and the only determinant of rural to urban migration. According to Todaro's two-sector analysis,[6] however, it is the differentials in real incomes and employment probabilities together which determine the decision to migrate. When expected income in the urban sectors equal the wages in agriculture, then the distribution of labour in rural and urban areas simultaneously reaches equilibrium.

Because of the co-existence of formal and informal sectors in urban economies, rural migrants enter the informal sector at first and, while working in this sector, seek opportunities to enter the formal sector. The more jobs that are created in the urban formal sector, the more labourers are drawn from the urban informal to the formal sector, and the wider the income gap becomes between the rural and urban sectors, the larger the flow of migrants induced to leave the rural for the urban informal sector. Such a flow of labour would lead to overstaffing in the urban informal sector. Because the number of jobs created in the urban formal sector depends on the growth rate of industrial output and the rate of increase in labour productivity in the modern sector, any growth of urban industry will expand employment opportunities in the urban formal sector. However, enhanced employment opportunities in the urban formal sector might be cancelled out by greater flows of rural migrants motivated by wage increases in the urban sectors.

Fields criticizes the two-sector model of migration by pointing out that it fails to take into account the job search behaviour of rural migrants in the urban formal sector.[7] Because the probability of workers in the informal sector finding work in the formal sector is lower than that of their counterparts already in the formal sector, most rural migrants stay in the informal sector. Because they are hoping in the long run to find a job in the formal sector, with the compensation of a higher income, migrants are willing to accept wages even lower than in the agricultural sector. As an extension of

the Harris-Todaro model, Fields, by introducing job-searching behaviour, reveals the impact of rigid urban wages and the relative probability of employment on the process of migration.[8] He argues that significant underemployment in the urban informal sector would ensure a lower equilibrium unemployment rate than predicted by the Harris-Todaro model. The massive reservoir of underemployment in the informal sector keeps urban unemployment at lower levels than Todaro expects.

In a homogeneous labour market, the unemployment rate in the destination is one of the key variables influencing in-migration rate. By using the US census data, Topel shows that between 1970 and 1980 the average unemployment rate in the eastern, northern and central states rose by 23% relative to the national average, while corresponding sharp declines in unemployment rates were registered in the southwestern and western states.[9] During the same period, migration occurred in tandem with differences in relative employment growth rates in the different regions, with the southeastern and western states being destinations and the northern, central and northern states being the origins.

As the result of more active mobility of labour in developing economies, rural and urban labour markets begin to interact with each other. Any change in the labour market induces a corresponding change in wage rate and job availability, which in turn results in a revision of migrants' expectations. A higher unemployment rate reduces the probability of being employed and the earnings of migrants in urban sectors, thus slowing down migration flows. Internal migration in contemporary China is a product of the reforms and it expands as the economy as a whole moves towards being market-based, accompanying labour market development and the abolition of institutional barriers to labour mobility. Therefore, a direct reference to Todaro's and Fields's ideas is needed in order to expand their theories to fit China's unique case. While China has many similarities with other developing countries as far as the determination of migration is concerned, its feature of being in transition to a market economy makes it a case which stands out in the process of labour mobility from rural to urban areas.

First, not only do the income disparities between rural and urban areas, and among the eastern, central and western regions, motivate population migration, but so also do the differences in extent of marketization between rural and urban areas and among the eastern, central and western regions. The spatial pattern of migration has been formulated accordingly. At the current stage of China's development, labour is abundant relative to

physical capital. The comparative advantage of China thus lies in labour-intensive industries. Prior to the reforms, with the distorted price of capital, the state over-invested in capital intensive industries and depressed development of labour-intensive industries. This brought about an imbalanced industrial structure and led to inefficient resource allocation. Since the reforms, with a changing working environment for markets, more resources have been allocated to labour-intensive sectors and the comparative advantage of China has been better utilized. In short, development of commodities and factors markets has had the effect on the economy of a resource reallocation, and has contributed significantly to the overall economic growth.[10] Because of imbalance between regions in the development of factors markets, it is mainly the coastal provinces that have enjoyed the effect of resource reallocation. This is reflected by the fact that China's outward economy, which seeks to utilize its comparative advantage, is concentrated in the coastal regions. In the year 2000, 92.1% of the total value of imports and exports in China was attributed to the eastern region, and only 4.3% to the central region and 3.6% to the western region. In the same year, 86.5% of foreign direct investment was invested in the eastern region, 8.9% in the central region and 4.6% in the western region. As a result, labour mobility is more active in the coastal regions, and the direction of migration is characterized as being from the central and western to the eastern regions.

Secondly, as has been observed in other countries, the probability of actual internal migration tends to decline as the longer distances increase transportation costs, weakens social networks and therefore job information in destination places, and reduces the benefits a migrant expects to gain. Job insecurity and information uncertainty about the labour market of destination places have made migration a gradual process in which migrants have to take several steps, migrating beyond the home county first, and then beyond the home province. Networks play a dominant role in helping migrants to obtain information about living and jobs in the destination places. Cai finds that 75.8% of intra-provincial and 82.4% of inter-provincial migrants who had already found work in the receiving city of Ji'nan, Shandong province, had done so with the help of their relatives, fellow villagers and friends in the city.[11] Willingness to migrate is reduced by weakened networking, as distance increases, because the migrants have to overcome the increased costs of moving out of their home village, face higher uncertainty in the destination job market, and lower expected earnings to compensate for these costs. As Greenwood suggested, previous

migrants (migration stock) can provide information and other assistance to later migrants, which reduces the latecomers' migration risks and uncertainty in their migration decisions.[12]

Thirdly, while the *hukou* system continues to separate the labour market that deters labour mobility, the merging trend of these two sectors does link migrant workers to employment conditions in the formal urban labour market. As the state sector suffers losses and the non-state sector expands, more and more former employees of state-owned enterprises come to compete with migrants for jobs in the informal sector. On the other hand, under pressure from unemployment in urban areas, local governments enact various policies discriminating against migrants and protecting local workers. Under such circumstances, the decision of migrant workers on the question "Should I stay or should I go?" relies on the situations in both the informal and formal sectors, and is not a permanent but a temporary one. This is neither the same as Harris and Todaro and Fields suggested (that migrant workers engaging in the informal sector are temporary and waiting for acceptance in the formal sector),[13] nor similar to what Sethuraman observed in other developing countries (that most informal sector migrant workers view their situations as permanent).[14] As a widely observed phenomenon, the movement of rural labour to cities and more advanced regions is characterized as seasonal, circular and short. As Solinger points out, the significant increase in urban demand for migrant labour is one necessary condition for a substantial change of the *hukou* system.[15] In regions where the non-state economy, especially foreign direct investment, is expanding fast, market forces play a greater role and migration is encouraged more.

## Spatial Patterns of Migration

Since 1990, when regional disparity in income began once more to widen and, at the same time, factors markets became more important forces in the allocation of capital and labour, the booming coastal regions have attracted massive flows of labour. Benefiting from the early openness of their economies, the coastal provinces have been leading in the development of factors markets. This eliminates the institutional obstacles which prevent factors of production from moving across regions, and they become major destinations of labour flows. The labour inflows in turn provide an important source of economic growth in these regions and improve their efficiency of labour allocation.[16] By summarizing data from a population

survey, and the 1900 and 2000 national censuses, Table 1 shows the changes in spatial patterns of migration. In the period 1987 to 2000, intra-regional (mainly intra-provincial) migration dominated, with some changes occurring as time went by. First of all, the share of inter-provincial migration within the eastern region increased, while the shares of inter-

**Table 1: Regional Distribution of Migrants (%)**

| | Origin | | | |
|---|---|---|---|---|
| Destination | East | Central | West | National |
| East | | | | |
| 1987 | 91.0 | 13.6 | 9.7 | 40.5 |
| 1990 | 87.0 | 18.6 | 18.1 | 43.2 |
| 1995 | 92.6 | 30.5 | 22.7 | 54.1 |
| 2000 | 95.4 | 32.0 | 22.5 | 54.5 |
| Central | | | | |
| 1987 | 5.6 | 82.7 | 4.7 | 30.3 |
| 1990 | 8.4 | 75.8 | 7.5 | 29.9 |
| 1995 | 4.1 | 62.9 | 4.9 | 21.6 |
| 2000 | 2.5 | 65.1 | 2.6 | 22.7 |
| West | | | | |
| 1987 | 3.4 | 3.7 | 85.6 | 29.2 |
| 1990 | 4.6 | 5.5 | 74.4 | 26.9 |
| 1995 | 3.3 | 6.6 | 72.4 | 24.3 |
| 2000 | 2.0 | 3.3 | 74.9 | 22.8 |

Notes: (1) Migrants in 1987 refer to those who migrated between cities, towns and counties and stayed at destinations for six months or longer; migrants in 1990 refer to those who migrated between cities and counties and stayed at destinations for one year or longer; migrants in 1995 refer to those who migrated between counties, districts and counties and stayed at destinations for six months or longer; migrants in 2000 refer to those who migrated between townships, towns (*zhen*) and communities (*jiedao*), and stayed at destinations for six months or longer. (2) Although the statistical criteria of migration timing and space units are different in various years, the results in Table 1 can be used as a reference to compare changes in migration directions.

Sources: National Bureau of Statistics, *Tabulation on the 1987 1 Percent Sampling Population Survey of China* (Beijing: China Statistics Publishing House, 1988). National Bureau of Statistics; *Tabulation on the 1995 1 Percent Sampling Population Survey of China* (Beijing: China Statistics Publishing House, 1997); National Bureau of Statistics, *Tabulation on the 1990 Census of the People's Republic of China* (Beijing: China Statistics Publishing House, 1993); National Bureau of Statistics, *Tabulation on the 2000 Census of the People's Republic of China* (Beijing: China Statistics Publishing House, 2002).

provincial migration within central and western regions tended to decline. Secondly, the shares of migrations between central and western regions decreased, while inter-regional migration from the central and western regions to the eastern regions was constantly increasing (see Table 1).

Based on the long form of the 2000 census, 124.6 million internal migrants, 73.4% of whom were inter-provincial migrants, were counted. When we consider only inter-provincial migration, it is more obvious that the eastern region is the prime destination for migrants. From Table 2, we can see the spatial distribution of inter-provincial migrants. In 2000, 65% of the inter-provincial migration in the eastern region happened within this region, while 84% of inter-provincial migrants from the central region and 68% from the western region moved to the eastern region. In terms of the time trend, the share of inter-provincial migration within the eastern region increased by nearly 15%, and the share of migration from central and western to eastern regions increased by nearly 24%.

To understand the features of the origins and destinations of migration, it is useful to divide migration flows into four categories: (1) urban-to-urban migration, (2) urban-to-rural migration, (3) rural-to-urban migration, and (4) rural-to-rural migration. The two main forms of migration in China

**Table 2: Regional Distribution of Inter-provincial Migrants (%)**

| | Origin | | | |
|---|---|---|---|---|
| Destination | East | Central | West | National |
| East | | | | |
| 1987 | 49.7 | 61.7 | 44.2 | 52.0 |
| 1990 | 56.0 | 59.0 | 49.3 | 54.6 |
| 1995 | 63.5 | 71.8 | 56.5 | 63.1 |
| 2000 | 64.4 | 84.3 | 68.3 | 75.0 |
| Central | | | | |
| 1987 | 31.3 | 21.8 | 21.2 | 24.6 |
| 1990 | 28.4 | 23.5 | 20.4 | 24.0 |
| 1995 | 20.5 | 12.7 | 13.4 | 18.8 |
| 2000 | 19.7 | 7.1 | 7.9 | 9.8 |
| West | | | | |
| 1987 | 18.9 | 16.6 | 34.6 | 23.3 |
| 1990 | 15.6 | 17.5 | 30.3 | 21.4 |
| 1995 | 16.1 | 15.5 | 30.2 | 18.1 |
| 2000 | 15.9 | 8.6 | 23.9 | 15.3 |

Source: Same as for Table 1.

during this period of transition are rural-to-urban migration (40.7% of the total) and urban-to-urban migration (37.2%). Rural-to-rural migration makes up 18.2% of total migration, and urban-to-rural migration only 4% of the total. The proportion of urban-to-urban migration has increased over time, whereas the proportion of rural-to-urban migration has declined. This implies that the migration flows not only reflect structural changes in industry, but are also a product of labour mobility across regions and sectors.

## Determinants of China's Migration: An Empirical Framework

In empirical studies on migration, the early model of gross migration combined the gravity-based and employment-based approaches, and the modelled migration was a function of wages, unemployment rates, population size, and distances.[17] Generally, the following double logarithmic migration model is adopted to identify the impacts of determinants on migration:

$$M_{ij} = f(\ln X_i, \ln X_j, \ln D_{ij})$$

Where $M$ are the rates of migration, $X$ are the variables that affect migration, $D$ are migration distances, and $i$, $j$ represent receiving and sending places respectively.

Schultz argues that the variable of population in the gross migration model has no behavioural implications because it only captures the effects of other socioeconomic variables that affect migration but are not included.[18] Migration is a part of population growth. Incorporating the variable of population will cause simultaneous estimation bias.[19] Moreover, migration stock is a part of the current population. There will be a severe multi-co-linearity problem if one incorporates the variables of both population and migration stock into the gross migration model. Therefore, the variable of population is usually not introduced in the empirical model.

As for choosing functional form, Fields suggests that the migration decision is inherently a choice between a finite number of mutually exclusive discrete alternatives, and the asymmetric specification of the double logarithmic model substantially outperforms a symmetric specification based on ratios of labour market conditions in the origin and destination.[20] In addition, the log-log estimation is helpful to reduce the effects of outlier and heteroscedasticity on estimation efficiency, to satisfy the theoretical

requirement of the product between employment opportunities and wages, and enhance the goodness of fit. He introduced the lagged explanatory variables to overcome the problem of endogeneity. Following his method, this paper uses all the independent variables dated 1995.

Data on migration, migration stock and unemployment rates are from the long form of the 2000 census, 1 per cent sampling data of the long form of the 2000 census (hereafter simplified as 2000 census micro-data), and 1 per cent sampling population survey data in 1995. Data on wages comes from NBS.[21] Because the published census data does not provide information on the number of inter-provincial rural-to-urban migrants and their unemployment rates, we calculate those figures based on the 2000 census micro-data. A statistical summary of variables in the regressions is reported in Table 3.

Following Greenwood's method,[22] the rate of migration is calculated as the ratio of the numbers of persons who had resided in province *i* on 31 October 1995 and later, through migration, were residing in province *j* on 31 October 2000, to the total number of persons who resided in province *i* on 31 October 1995. Migration rates from long form data of the 2000 census capture four types of persons: rural to urban, rural to rural, urban to urban, and urban to rural migrants. Because the migration of rural labour is one of our central concerns in this paper, we also calculate migration rates for inter-provincial rural-to-urban migrants aged 15–64 by using the 2000 census micro-data. None of the migration rates calculated is high (See Table 3).

Migration distance is denoted by railway kilometres between the capital cities of province *i* and province *j*. In China, railway transportation is the major means of inter-provincial migration. Periodical congestion in railway transportation caused by returning migrants during the Chinese New Year period is proof of this. Migration distances represent the direct costs of migration transportation as well as the psychological costs. As migration distance increases, uncertainties and risks from migration also go up, and then the probability of migration decreases.[23]

There is some discussion about the comparison between rural and urban incomes, since a great part of the real income of urban residents cannot be covered by their nominal income, as income sources widened during the reform period.[24] O'Neill suggests that consumption may serve as a better explanation of migration than income variables.[25] In our analysis of migration, the average value of rural and urban per capita consumption expenditure in 1995, weighted by rural and urban population, is used as the

**Table 3: Statistical Summary of Variables in the Regressions**

| Variables | Observations | Mean | Standard deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Rates of migration from long form data (‰) | 756 | 0.92 | 2.94 | 0.00 | 41.22 |
| Migration distances (kilometres) | 756 | 1908.70 | 1011.76 | 137.00 | 6313.00 |
| Consumption expenditures in 1995 (RMB) | 756 | 2032.69 | 883.85 | 1212.74 | 5144.27 |
| Total unemployment rates in 1995 (%) | 756 | 2.71 | 1.55 | 0.80 | 6.40 |
| Migration stock from long form data (person) | 756 | 797446 | 414931 | 103604 | 1633757 |
| Total unemployment rates in 2000 (%) | 756 | 4.22 | 2.40 | 1.30 | 9.60 |
| Foreign direct investment in 1995 (million USD) | 756 | 1374.21 | 2198.11 | 0.60 | 10669.67 |
| Rates of rural-to-urban migration from micro-data (‰) | 506 | 1.38 | 4.58 | 0.02 | 52.42 |
| Unemployment rates of rural-to-urban migrants in 2000 from micro-data (%) | 506 | 4.83 | 2.41 | 1.87 | 10.34 |
| Unemployment rates of urban labour forces in 2000 from micro-data (%) | 506 | 9.17 | 3.19 | 4.01 | 17.68 |
| Migration stocks from micro-data (person) | 506 | 7260 | 3410 | 1214 | 13514 |

proxy variable of wage rates in the place of origin and the destination. We expect that consumption expenditure in receiving places has a positive impact on migration, and in sending places a negative impact.

Both the 1995 sampling survey and the 2000 census contain some information on the employment status of rural and urban labour forces. In the 1995 questionnaires there are three items indicating whether a person is unemployed in a time-period of a week just before the survey was carried out. A person is viewed as being unemployed if that person never worked before but is now looking for a job, or loses his job and is looking for a new job, or is from an enterprise which is ceasing production and is waiting for a new job. The unemployment statistics in the 2000 census incorporate these three categories into the first two. Rural and urban unemployment rates in 1995 are 2.2% and 3.6%, respectively. Based on the aggregate data on the

economically active population by city, town and county (rural areas) in the 2000 census, unemployment rates in city, town and county are 9.4%, 6.2% and 1.2%, respectively. According to the 2000 micro-data, the calculated unemployment rates for urban residents, urban-to-urban migrants, and rural-to-urban migrants are respectively 9.1%, 7.9% and 3.6%.

If migration stock were excluded from an empirical model, an over-estimation of the effects of other explanatory variables on migration would occur.[26] Following Greenwood, we use the number of persons born in other provinces and living in province *j* before 1 November 1995 as migration stock in our regression. The long form data of the 2000 census provides this information, and micro-data of the 2000 census provides the number of persons aged 15–64 born in other provinces and living in province *j* before 1 November 1995. We expect migration stock to have a positive impact on migration.

Apart from the suggestion of Chan et al. in their paper that FDI firms are mostly labour-intensive and thus attractive to labour migration,[27] we choose amount of FDI as the proxy variable of marketization for two reasons. First of all, whether or not, and how much, FDI flows into a certain region is the independent choice of foreign investors, which makes it an exogenous variable. Secondly, FDI inflow reflects the overall results of marketization, including the function of the commodity market and the factors markets, transparency of government policy, and other policy environment. Although FDI inflow in all provinces has increased since the reforms, it differs between eastern, central and western regions, and the gap has widened. A deep international division of labour brings about a higher degree of market-oriented allocation of factors of production. The concentration of migration flow in the eastern regions has a close relationship with their openness and participation in the international market.

## Regression Results and Discussions

The regression results are reported in Table 4. The regression equations (1) to (3) are based on long form data in the 2000 census, equations (4) and (5) are based on micro-data in the 2000 census. Because Hainan and Tibet are not connected to other cities directly by rail, and Chongqing was not previously a capital city, the distances connecting those three provinces to others are not available, so we exclude those three provinces from our regression. The final observations are 756 regressions using long form data. In analysing the micro-data, some rates of migration, and the numbers

**Table 4: Regression Results of Migration**

| | Rates of inter-provincial migrants | | | Rates of inter-provincial rural-to-urban migrants | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Distances | –1.136 | –1.081 | –1.099 | –0.758 | –0.772 |
| | (19.08)** | (19.19)** | (19.64)** | (10.08)** | (10.27)** |
| Consumption level at origin | –0.797 | –0.518 | –0.366 | 0.150 | 0.057 |
| | (6.35)** | (4.13)** | (2.31) | (0.95) | (0.35) |
| Consumption level at destination | 1.499 | 1.964 | 1.453 | 1.266 | 1.504 |
| | (10.79)** | (14.45)** | (8.26)** | (8.48)** | (9.62)** |
| Unemployment rates at origin 1995 | 0.439 | | | | |
| | (5.69)** | | | | |
| Unemployment rates at destination 1995 | –0.195 | | | | |
| | (2.07)* | | | | |
| Unemployment rates at origin 2000 | | 0.184 | 0.153 | | |
| | | (2.11)* | (1.65) | | |
| Unemployment rates at destination 2000 | | –0.643 | –0.645 | | |
| | | (7.31)** | (6.93)** | | |
| Unemployment rates of migrants at Origin | | | | 0.060 | |
| | | | | (0.70) | |
| Unemployment rates of migrants at Destination | | | | –0.292 | |
| | | | | (3.35)** | |
| Unemployment rates of urban residents at origin | | | | | 0.347 |
| | | | | | (2.38)* |
| Unemployment rates of urban residents at destination | | | | | –0.509 |
| | | | | | (3.37)** |
| Migration stock at destination | 0.737 | 0.719 | 0.304 | 0.330 | 0.301 |
| | (11.69)** | (12.66)** | (2.93)** | (3.31)** | (2.86)** |
| FDI at origin | | | –0.039 | | |
| | | | (1.86) | | |
| FDI at destination | | | 0.185 | | |
| | | | (4.68)** | | |
| Intercepts | –8.247 | –13.241 | –5.661 | –8.794 | –9.451 |
| | (4.82)** | (8.10)** | (2.33)** | (4.38)** | (4.64)** |
| Observations | 756 | 756 | 756 | 506 | 506 |
| $R^2$ | 0.56 | 0.56 | 0.58 | 0.32 | 0.32 |

Notes: (a) Based on the method of Breusch-Pagan / Cook-Weisberg, the values of $\chi^2$ in the regression equations are 7.85, 1.54, 1.38, 2.80 and 4.85, respectively. We employed robust estimation in regression equations (1) and (5) to overcome problems of heteroscedasticity. (b) Those in parentheses in equations (1) and (5) are the absolute values of robust t-statistics, and t-statistics in equations (2) through (4); * represents significant at 5%, and ** significant at 1%.

of rural-to-urban migration, in some provinces are zero, their logarithmic transformations are left out, and therefore the final number of observations is 506.

According to the results in Table 4, regression equations from long form data explain up to three-fifths of the variance in inter-provincial migration rates of all migrants, those from micro-data explain about one-third of the variance of inter-provincial rural-to-urban migration rates. The results of asymmetric specification of the log-log migration model also support the proposition that the impacts of economic conditions in the destination out-perform those in the origin.

In regression equations (1) and (5), the coefficients of explanatory variables — migration distances, per capita consumption expenditures, unemployment rates, and migration stock levels are mostly significant at 1% or 5%, and their signs are consistent with theoretical assumptions.

The difference between regression equations (1) and (2) is that the former uses unemployment rates in 1995, while the latter uses unemployment rates in 2000. Inclusion of the variable of unemployment rate in 1995 overcomes the endogenuity problem, but the magnitude of coefficient of unemployment rate at the origin surpasses that in the destination in regression equation (1), which is inconsistent with the reality.

In the period from 1995 to 2000, the employment environment in urban China changed dramatically. As the reforms of SOEs and the social security system bit deeper in the second half of the 1990s, a large number of redundant workers were laid off from SOEs, causing an increase in the urban unemployment rate. In order to secure local residents' jobs, urban governments tend to protect the local labour market through a variety of policies discriminating against migrant workers. Being rational players, who frequently calculate risk and costs in their decisions about migration, migrants choose not to migrate if the urban labour market becomes more protected and there are fewer opportunities for job-hunters. The fact that the unemployment rate in 2000 can at closer range reflect the changed employment environment gives us a better reason to analyse the impacts of various factors on migration based on regression equation (2).

Keeping distance constant, a 1% increase in migration distance will lead to a 1.08% decline in migration rate. In reality, dominant numbers of migrants in 2000 were intra-provincial, accounting for over 70% of total migrants. Although distance is given spatially, a more convenient transportation environment and more reasonable charges of transportation can help reduce costs of migration, promoting labour mobility across regions.

The results of regression equation (2) are consistent with what the Todaro model predicted by estimating right signs and significant coefficients of per capita consumption and unemployment rate at both origin and destination. The effects of both per capita consumption and unemployment rate at the destinations are much greater than those at the places of origin, with magnitudes of coefficients of per capita consumption and of unemployment rate at destination places being nearly 3 times and over 2 times higher than that at the places of origin. The greater marginal effects of the unemployment rate on migration decisions are caused by the alternative options facing migrants. To would-be-migrants, the labour market situation at the place of origin is something they have no choice but to view as given, while they have many alternative destinations to migrate to. Therefore, the migration decision is more sensitive to the unemployment situation and income level at the destination.

The importance of information provision on employment is evidenced by the correct sign and significance of the coefficient of migration stock at destination places. The policy implication is that although networks play an important role in providing information on destination places through informal channels, it is desirable to strengthen the public infrastructure of the information service in order to meet the needs of labour market development.

Incorporating the variable of FDI flows into regression, we get regression equation (3). The introduction of this new variable does not change the coefficients and significance of explanatory variables of migration distances, migration stocks, unemployment rates and per capita consumption expenditures too much. In absolute values, the coefficient of per capita consumption expenditures in regression equation (3) is smaller than that in regression equation (2). The coefficients of per capita consumption expenditures in sending and receiving places become less significant in regression equation (3), mainly because there is a correlation between FDI inflow and per capita consumption (income).[28] The concentration of inter-provincial migrants in coastal areas also has something to do with the FDI concentration.[29] With the introduction of the variable of FDI, the magnitude of regression coefficient of migration stock dropped by 50%.

To examine more closely the impacts of the urban labour market on the decision-making of migrants, in regression equations (4) and (5), we incorporate the variables of unemployment rates of rural-to-urban migrants and urban labour calculated from micro-data, into a rural-to-urban migration model. Their signs are consistent with theoretical assumptions and their

coefficients are reasonably significant, characterized as a greater magnitude of the unemployment rate of urban workers. This implies that the improvement of the urban employment environment is of great importance in helping promote labour mobility. Although the coefficient signs of consumption level at origin in regression equations (4) and (5) are opposite to the results in regression equations (1) to (3), they are statistically insignificant. The signs and significance of consumption level at destination are consistent, and also support the empirical findings that the variables at destination have larger impacts on migration.

## Concluding Remarks

The migration which has emerged in China since the 1980s is characterized not only by the economic transformation from an agriculture-dominated economy to an industrial one, a common phenomenon in developing countries, but also by the fact that China is undergoing a unique economic transition from a planned economy to a market economy. Taking both processes into consideration not only sheds light on the unique institutional phenomenon impacting on migration in contemporary China, but also allows us to extend the application of general theories on migration to China's case.

In the double logarithmic migration model, unemployment rates and FDI — a proxy indicator of marketization — are employed for our empirical analysis. Our findings show that the differences in expected income and in extent of marketization between regions are overwhelming factors shaping the general direction of migration — that is, flows of migration are mainly from rural to urban areas and from the central and western to eastern regions. Moreover, the impact of the variables at destination outperform those at origin. With changes in the urban employment environment, the employment opportunities and availability in urban areas become more important factors in determining which migration decision is made. The results from the variables such as migration distance and migration stock are also significant, which implies that reducing migration costs by improving transportation and employment information services is the way to promote labour mobility.

Since further economic growth in China will to a large extent rely on an improvement of resource allocative efficiency gained from the mobility of production factors, especially of labour,[30] it is very important to create an environment in which the labour market functions, especially in central

and western regions. Abolition of the various institutional obstacles that hinder the development of a labour market will not only normalize migration flows in a rational way, but also gain a significant efficiency in resource reallocation. The increased outward economic development stimulated by foreign direct investment and international trade serves to kill two birds with one stone — that is, it requires the same development climate as labour mobility does, and while creating job opportunities, it creates the conditions required for *hukou* reform.

## Notes

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transfers could annually contribute as much as 2 or 3 percentage points to annual economic growth. (D. Gale Johnson, “Agricultural Adjustment in China: The Taiwan Experience and Its Implications,” Office of Agricultural Economics Research, The University of Chicago, 1999).