

Globalization, labour market and internal migration: Evidence from China

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Abstract

The main objective of this paper is to evaluate the impact of globalization on internal migrations using data on Chinese provinces. The opening-up policy launched by Chinese authorities at the end of the 1970s, has resulted in widening regional disparities in terms of income and job opportunities that motivated large movements of workers from depressed areas to those offering more prosperous prospects. Our results, based on migrations flows registered on the 1985-2000 period, emphasize that migration choices in China are driven by spatial job opportunity search: differentials of wage and job opportunities prompt redundant workers to engage into migration. Globalization reinforces the capacity of absorption of workers in a given province so that it reduces their incentives to engage into inter-provincial migration. In addition, once workers decide to move outside of their location of origin, they tend to be attracted to outward-oriented provinces. This phenomenon is however weakened by the degree of labor market fragmentation. Alternatively, diversification into a knowledge based economy reinforces the attractive impact of openness for urban migrants.

JEL Codes: R23, F16, P21.

Keywords: globalization, China, internal migration, labor market.

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1 Introduction

This paper presents a case study of the impact of globalization on internal migrations using data on Chinese provinces.

We choose China as the focus of our study, for several reasons that have been put forward by Wei and Yu (2001) in their work on globalization and inequality and by Wei (2002).

First, the recent history of China offers a quasi-natural experiment on the consequence of embracing globalization. Prior to the implementation of the economic reforms in 1978, China's economy was characterized by an introverted development strategy. The country had relatively little trade with the rest of the world. In 1978, Deng Xiaoping led Chinese government formally adopted "opening-to-the-outside-world" as a national economic policy. Since then, the trade-to-GDP ratio increased almost fourfold, from 12.6% in 1980 to 29.7% in 1990 and 44.5% in 2000¹.

The opening-up policy first materialized on the South-East coast with the creation of five Special Economic Zones (SEZ). The establishment of SEZ was the centerpiece of the policy. It was rapidly followed by the creation of fourteen Opened Cities and of an open coastal belt. The successful promotion of international opening-up is widely acknowledged. The process of trade liberalization has materialized in the entry of China in the WTO at the end of 2001.

As explained by Wei and Yu (2001), the international opening-up of China did not benefit to the entire country in an homogeneous manner:

"When the central government reduces the policy barriers to trade, which includes policy-induced dis-incentives for exports as well as tariffs and non-tariff barriers to imports, all regions in China benefit. However, due to unequal natural barriers to trade (i.e., distance and access to the major seaports), the actual increase in openness varies widely across the different regions in China."

As argued by the authors, this variation across space provides a good opportunity to study the impact of openness while holding constant the legal system, macroeconomic policies, culture and a host of other factors.

Second, interregional labor mobility is one of the key issues in China's transition to market economy. To move away from its duplicative industrial structure inherited from the planned and autarkic development strategy², China has to real-

¹Trade data are taken from the Chinese customs (National Bureau of Statistics of China, 2001).

²Refer to Young (2000) and World Bank (1994) for evidence of low economic integration within Chinese provinces.

locate its activities. The country has to engage itself in an agglomeration process of industries. The lack of mature and integrated capital markets and the persistence of impediments to interprovincial trade flows make labor mobility even more vital to achieve a successful transition.

The impetus for migration in China is rooted in the simultaneous increasing demand for labor in developing export-oriented activities and excess supply of workers, mostly in rural areas. Employment is unanimously considered by China's experts as the most serious problem the country is confronted to. Even though the economy is growing and international trade is flourishing, rises in productivity, output rationalization and increase in competition have meant that millions of workers have become redundant, in manufacturing industries as well as in agriculture. Conservative estimates regard one third of people working in the countryside on agricultural production are regarded as in surplus. In cities, unemployment has risen in relation with the restructuration of State-Owned-Enterprises and the public sector. According to official statistics, it reached 4.2% at the beginning of 2003.

Third, as already argued in Wei (2002), China's geography also turns out to be convenient for the type of statistical analysis that this paper aims at carrying. An important issue in this research is that openness may be endogenous. In the literature, Frankel and Romer (1999) pioneered the technique of using geography as an instrument for openness: Geography is an important determinant of trade, and is arguably exogenous with respect to economic growth, income inequality and therefore incentives for inter-provincial migrations.

The geography-based heterogeneity of Chinese provinces' engagement in globalization provides a suitable case to apply the Frankel-Romer technique.

China is semi-landlocked. It has a coast on the East and Southeast sides, but is surrounded on other sides by tall mountains, deserts, or foreign territories that are minor participants in international trade. We argue that the differences across Chinese provinces in terms of participation in international trade are, to a large degree, due to their varying distance from the nearest access to the international waters and to China's major seaports. Moreover, we consider that the international integration of Chinese provinces is directly related to the existence of common land borders with international partners with which they share common features. These specificities allow us to construct an instrumental variable for a province's openness based on its distance to the nearest seaport, its access to two major trade oriented provinces, namely Shanghai and Guangdong as well as to its sharing of international land borders.

Section 2 presents stylized facts about globalization and internal migrations in China. Section 3 develops the multi-regional model we rely on to estimate the

impact of globalization on inter-provincial migrations in China. Section 4 presents the data and the construction of the key variables used in the empirical estimations. Section 5 presents the results of the econometric regressions. Section 6 concludes.

2 Openness and migratory flows in China

Over the past twenty years, the Chinese economy has progressively transformed into a market economy. The main manifestation of this transition is the growth of foreign trade. The promotion by the authorities of international openness was motivated by the search for dynamic and static gains resulting from increased competition, the diffusion of technological progress and the determination of production according to comparative advantages.

During this period, the Chinese government progressively abandoned its “egalitarian” and autarkic development strategy for a regional preference policy in favor of the coastal provinces of the South-East (Fan, 1999; Yang, 1997). A strict spatial hierarchy was put in place to favor the development of largest coastal cities. Preferential treatment of the coastal regions beside prompting modernization, efficiency and economic growth, materialized in increasing divergence in income and consumption levels within the country and especially between rural and urban areas (Bhalla, 1990; Chen and Fleisher, 1996).

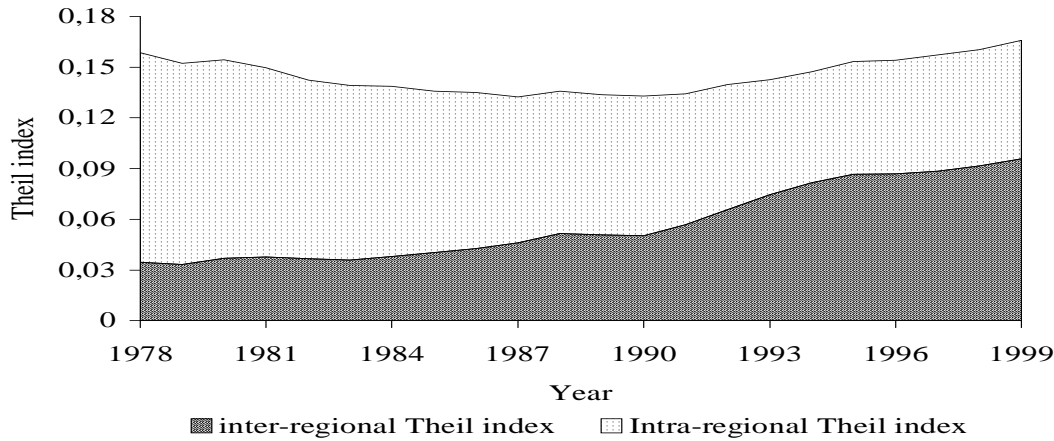
The most striking disparities took place between the coastal and interior regions.

The following graph presents the evolution and the decomposition between interior and coastal areas of the Theil index, computed based on the share of provinces’s real GDP and population.

Inter-provincial differences in terms of GDP per head decreased over the 1980 before going up again in the 1990s. The decomposition of the Theil index clearly indicates that the decline in disparities that occurred over the period 1978-1989 resulted essentially from the reduction of the gap between coastal and interior provinces. On the opposite, the surge in total disparity over the 1990s is rooted in the widening disparity between provinces. In other words, over the past decade, income levels have diverged between coastal and interior provinces of China, while income homogeneity has improved within provinces.

Increasing income disparities between the most internationally integrated regions and the least opened provinces in China logically encouraged workers to leave their rural areas and seek better job opportunities in cities. Classical theories of development economics describe migration choices of workers as essentially driven by spatial job opportunity search, or more precisely by obtaining higher income.

Evolution of Theil index in China



These spontaneous movements of population progressively eased existing constraints on migration.

Before the 1980s, interprovincial migrations were strongly restricted by Chinese authorities (Liang and White, 1996). Spatial displacement of population, especially that of rural workers, was heavily controlled. The government resorted to two complementary measures. First, a high opportunity cost is imposed to those who leave rural areas through a link between personal income and participation in the daily work in the collective farm. Second, a system of civil status registration (*hukou*) is put in application. As described in Chan (1994), the *hukou* system in China is similar to an domestic passport system. It establishes a tight relation between place of residence and access to consumer goods, employment opportunities and social protection.

A comprehensive description of the migration restrictions, even one focused solely on the evolution with respect to economic reforms is well beyond the scope of the paper. The reader is directed to Liang et al. (1996 and 1997), Li (1997), Chan (1994) and Fan (1999) for well-regarded studies. Au and Henderson (2002) explain in detail how a person's local "citizenship" and residence are initially defined for a child as a birth right, traditionally by the mother's place of legal residence.

Permanently leaving a village is therefore costly as it means abandoning ownership claims without compensation to long-detained agricultural land and to the profits of local rural industries which are distributed in-kind, such as township housing. Temporary migrations also involve costs. Other restrictions encompass hurdles to getting the compulsory permit in order to be a legal immigrant (necessary permission from the home location, proof of guaranteed job and specific housing.), job

restrictions and various additional expenses.

Finally, migrants can be required to pay diverse fees, in the city of destination, such as for city management, for “being a foreign worker”, for crime fighting, for city construction... Au and Henderson (2002) argue that although most of these fees were officially abolished in 2001, unofficially a number persist. All these restrictions sharply reduce the benefits and raise the costs of migration, particularly in large cities, where authorities continue to control migration by various direct and indirect measures because infrastructure can not sustain a massive exodus.

Despite restrictions, the combination of increased freedom of movement and widening provincial income differences has led to the amplification of migration flows. In particular, the implementation and generalization of the Household Responsibility system (*HRS*) in rural areas, at the end of the 1970s, brought back greater freedom to rural workers for them to choose their occupation. Increasing differentials of wage and job opportunities prompted redundant workers to engage into migration.

Chan and Zhang (1998) argue that the new reality of reforms has reduced the state capacity of controlling migrations. On the one hand, there has not been any substantial modification of the nature of the *hukou* system. Changes over the 1980s and the 1990s essentially consisted in a relaxation of the regulation to convert an rural *hukou* into an urban one.

This process, called *nongzhuanfei*, remains however subject to quotas. The classification of the registration system into agricultural/non-agricultural persists. The socio-economic integration of a person is still closely related to its *hukou*. Reforms since the end of the 1970s have however modified the global structure of economic control within which the *hukou* system is integrated. As the state withdrew from the allocation of jobs and distribution of consumer goods, its capacity to monitor and keep watch on the population’s movement faded significantly.

As a result of “opening-to-the-outside-world” policy, coastal provinces experienced an impressive economic development notably through the massive inflow of foreign capital and the introduction of market mechanisms. In coastal provinces of South-East China, successful international opening, rapid economic development and massive inflow of foreign investment prompted urbanization and migration (Sit and Yang, 1997; Li 1997). Particularly, Special Economic Zones were created to grant special treatment to foreign investors and industrial enterprises. The coast, characterized by an ever increasing international engagement shows an economic growth that exceeds by far the national average. Activities in these zones are dominated by foreign-oriented sectors. These labour-intensive activities greatly raised employment demand and provoked an increase in wages, thus attracting even more

workers from other regions.

As put forward by Au and Henderson (2002), it becomes easier for a person to be hired as a “contract worker”, either in industry or services for a term of three years. A rural person may get permission to work temporarily in another local area in activities such as construction, food services or domestic services. People may also decide to move illegally, without registering in the new location, to work in the informal sector. They are however destined to get very low pay and to live under poor conditions while always being in danger of deportation.

Despite these possibilities and some recent relaxations of migration restrictions in particular provinces, the authors argue that impediments to workers’ mobility remain tight in China. Opposition to freedom of movement for rural workers relates to the issue of unemployment in urban areas in a context of restructuring of state-owned enterprises. Moreover, urban residents balk at sharing their relatively higher living standards with newcomers from rural areas. As in the case of international migrations, interprovincial migration restrictions reflect the policy stance of authorities in receiving provinces. Immigration is considered to aggravate employment and wage conditions of unskilled labour and to threaten security.

The following maps describe the thirty most important inter-provincial migratory flows over the three periods 1985-1990, 1990-1995 and 1995-2000.

Table 1 provides the raw data taken from the population surveys.

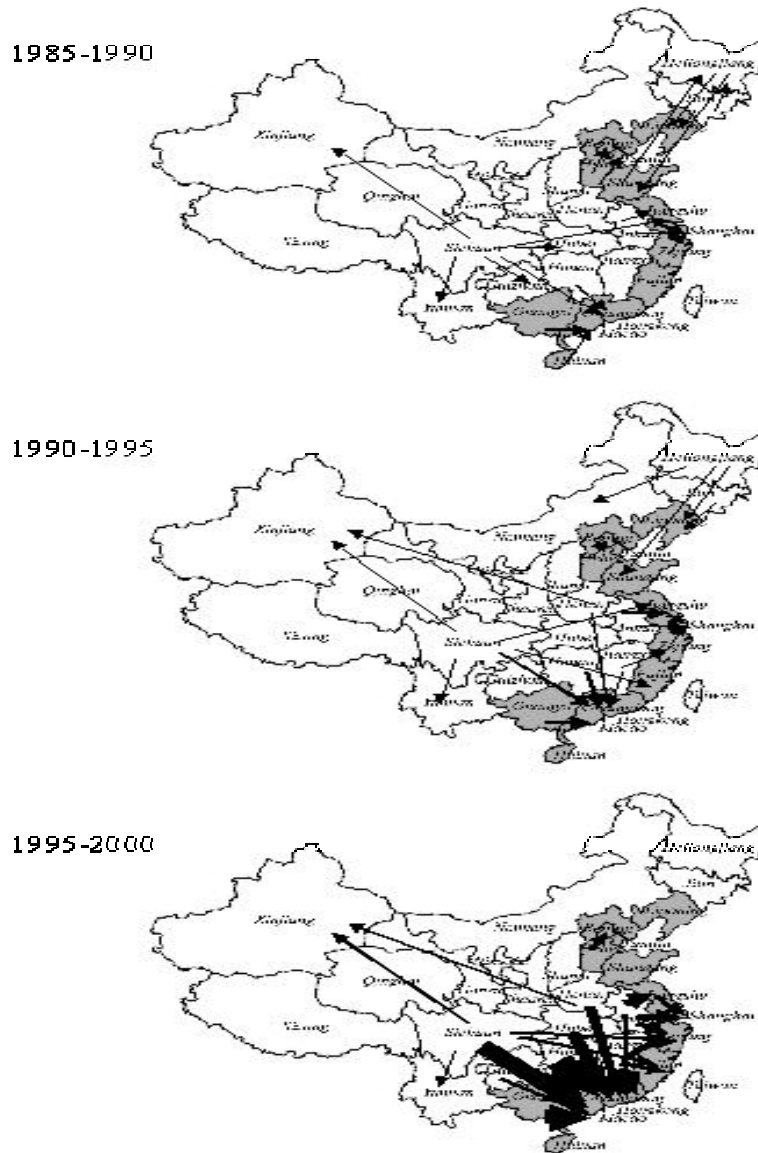
It appears that the major migratory flows take place from interior to coastal provinces. In the three periods of study, the Pearl River Delta centered on Guangdong, the Yangtse delta centered on Shanghai, the largest city in China, as well and the Bohai gulf region centered on Beijing (China’s capital city) are the three main destinations where migrants converge.

The “opening-to-the-outside-world” policy was first experimented in Guangdong. This province therefore benefited from the most favorable external conditions (in relation to its strategic location across Hong Kong island) and preferential policies. The outward-oriented activities stimulated the demand for labor and induced a wage surge that attracted numerous workers from the rest of the country.

The attraction power of South-East provinces has strengthen over time, reflecting the reality of the deepening of the reforms and of the globalization process in the 1990s.

Another characteristic of inter-provincial migrations consists in the “proximity effect”. Migrations between neighboring provinces are far more intense than between further apart locations.

Map: Destination of major inter-provincial migratory flows in China



The thickness of the arrows approximately stands for the intensity of the corresponding migratory flow

Source: (1) Population Census Office under the State Council (1991), *10 Percent Sampling Tabulation on the 1990 Population Census of the People's Republic of China*, Beijing, China Statistical Publishing House. (2) National Bureau of Statistics of China (1997), *Figure of 1% Population Sample Survey in 1995*, Beijing, China Statistics Press. (3) National Bureau of Statistics of China (2002), *Figures on 2000 Population Census of China (CD-ROM)*, Beijing, China Statistics Press.

Table 1: Major inter-provincial migration flows in China

1985-1990			1990-1995			1995-2000		
Province of origin	Province of destination	Number of migrants thousand	Province of origin	Province of destination	Number of migrants thousand	Province of origin	Province of destination	Number of migrants thousand
Guangxi	Guangdong	30	Hunan	Guangdong	443.3	Hunan	Guangdong	2488.2
Hebei	Beijing	224.5	Guangxi	Guangdong	439.5	Sichuan	Guangdong	1740.2
Hunan	Guangdong	207.9	Sichuan	Guangdong	35.7	Guangxi	Guangdong	1628.5
Jiangsu	Shanghai	189.8	Anhui	Jiangsu	266.8	Jiangxi	Guangdong	1628.5
Anhui	Jiangsu	151.3	Jiangxi	Guangdong	194.5	Hubei	Guangdong	1149.1
Heilongjiang	Liaoning	147.2	Sichuan	Xinjiang	166.5	Henan	Guangdong	808.8
Heilongjiang	Shandong	13.9	Hebei	Beijing	164.6	Anhui	Jiangsu	752.5
Sichuan	Yunnan	124.1	Jiangsu	Shanghai	16	Anhui	Shanghai	686.4
Anhui	Shanghai	13.7	Henan	Xinjiang	16	Jiangxi	Zhejiang	613.0
Sichuan	Guangdong	119.4	Anhui	Shanghai	160.4	Anhui	Zhejiang	560.7
Sichuan	Xinjiang	13.5	Heilongjiang	Shandong	13.2	Jiangsu	Shanghai	474.4
Sichuan	Guizhou	106.8	Heilongjiang	Liaoning	119.2	Guizhou	Guangdong	453.9
Hebei	Tianjin	106.0	Sichuan	Yunnan	110	Jiangxi	Fujian	420.3
Sichuan	Jiangsu	96.6	Henan	Guangdong	99.2	Hebei	Beijing	373.8
Zhejiang	Shanghai	96.5	Zhejiang	Shanghai	97.5	Sichuan	Zhejiang	355.3
Sichuan	Hebei	29	Sichuan	Fujian	96.6	Anhui	Guangdong	285.7
Hainan	Guangdong	84.4	Heilongjiang	Inner Mongolia	96.3	Sichuan	Xinjiang	277.3
Jilin	Liaoning	2.8	Sichuan	Jiangsu	94.6	Sichuan	Fujian	20
Shandong	Heilongjiang	78.8	Jilin	Liaoning	85.4	Henan	Xinjiang	246.7
Jilin	Heilongjiang	78.0	Jiangxi	Zhejiang	84.9	Sichuan	Yunnan	235.8

Source : Population Census Office under the State Council, 1991;
National Bureau of Statistics of China, 1997; National Bureau of Statistics of China, 2002.

The major migratory flows take place between provinces that share a common border. It reflects the extra-cost of moving particularly far from the departure location that relates to the issue of networks and socio-cultural similarities.

The specific case of the three provincial-level cities is worth noticing. Beijing, Tianjin and Shanghai are important harbors and privileged exchange places (stock exchange in Shanghai). It is furthermore necessary to understand that the borders of these provincial-level cities are artificial in the sense that these cities are separated administratively from their periphery (Hebei province for Beijing and Tianjin and Jiangsu and Zhejiang for Shanghai).

The natural influence zone of these cities, which are important industrial and consumption centers, go well further than their administrative borders. As a matter of fact, the area covering the south of Jiangsu, the north of Zhejiang and the city of Shanghai constitutes a coherent economic zone that corresponds to the Yangtze delta. It is logical to observe large migration flows from the periphery to the center of these economic regions.

3 The Model

We follow the model developed by Aroca and Hewings (2002) to study migration processes in Chile. Our model mainly rests on the logic that workers move in order to obtain greater incomes³. We argue that in the Chinese context of increasing liberalization, workers focus mainly on salaries and the labor market conditions in each of the regions in the process of making the migration decision. We moreover take into account other variables that affect migration such as the probability of finding a job and the role of amenities.

The model is drawing on classical consumer theory. A worker's migration decision is represented by the following utility maximization problem over potential locations j :

$$\text{Max}_{X_j, T_j} U_j(X_j, T_j, Z_j) \tag{1}$$

subject to a budget constraint:

$$I_j = P_x X_j + P_{T_j} T_j$$

³Our intention is not to identify the various determinants of migrations as in traditional micro-economic studies of migration flows. Refer to Fan (1999), Liang and White (1996, 1997), Ma et al. (1997), Ma and Liaw (1997) and Zhu (2003) for specific micro-economic studies of inter-provincial migrations in China.

According to Aroca and Hewings (2002), X_j is a composite good other than transportation that the migrant demands in location j , T_j is equal to one if transportation is necessary to move from the origin to region j and zero otherwise, Z_j is the set of other characteristics of region j that are taken into account by the worker, I_j is the income of the worker at region j , and P_x and PT_j are the prices of goods and transportation respectively. It is assumed that PT_j changes as a function of the distance and that it is increasing at a decreasing rate.

The model relies on the hypothesis that the prices of goods are invariant across regions. The indirect utility function for a worker that considers migrating from its region of origin, i , to region j is:

$$V_j = V_j(P_x, P_{T_j}, I_j, Z_j) + \epsilon_j \quad (2)$$

where, ϵ_j is a stochastic error (Ben-Akiva and Lerman, 1985). The worker compares the utility that he can derive from each possible destination region (including the origin region) and he chooses the region that maximizes his utility. As argued by Aroca and Hewings (2002), this utility maximizing selection can be cast as a random utility process subject to a stochastic error. A logit specification is derived if a generalized extreme value distribution is assumed. The probability of a worker moving from region i to region j is equal to:

$$P_{ij} = \frac{e^{V_j}}{\sum_{k=1}^K e^{V_k}} \quad (3)$$

where K is the number of alternative regions, j , to which the worker can move, including the origin region.

Unfortunately, access is available only to aggregate data. We consider Kanaroglou and Ferguson (1996)'s statement that "because choice models are firmly rooted in behavioural theory, aggregation must result in models consistent with theory". Thus, some additional derivations are necessary to derive an estimable equation with aggregate data. Following Berkson's method (see Berkson 1944; Ben-Akiva and Lerman 1985; Gourieroux 2000 for a generalization), imposing the constraint that $\sum_{j=1}^K P_{ij} = 1$ and normalizing by the probability of staying in the current region P_{ii} , expression (3) can be modified to the following form:

$$\ln \frac{P_{ij}}{P_{ii}} = \ln V_j - \ln V_i = \alpha_0 + \alpha_1 \ln P_{T_j} + \alpha_2 \ln \frac{I_j}{I_i} + \alpha_3 \frac{Z_j}{Z_i} \quad (4)$$

where the α 's are coefficients or vector of coefficients associated with the variables that determine the indirect utility function which is assumed logarithmic in

the variables.

4 Empirical estimation

4.1 The Data

Migration data

We use data from the “10 Percent Sampling Tabulation on the 1990 Population Census of the People’s Republic of China” (Population Census Office under the State Council, 1991: pp. 484-675), the “Figure of 1% Population Sample Survey in 1995” (National Bureau of Statistics of China, 1997: pp. 558-617), as well as the “Figures on 2000 Population Census of China (CD-Rom)” (National Bureau of Statistics of China, 2002).

The data report the place of residence at the time of the survey (1990, 1995 and 2000 respectively) as well as the answer of the respondents to the question “What was your place of residence at the 1st of July 1985, 1990 and 1995 respectively (that is five years before the survey)?”. We consider those who change their place of residence (even within the same province) to be migrants.

The datasets provide information on the origin of the migrants. They distinguish between urban and rural departure locations. As a consequence, we first will look at the aggregate migratory flows. In a move to better understand the relation between globalization and inter-provincial migrations and analyse the specific impact of globalization depending on the labor market conditions, we will then run separate estimations of the model depending on the subsample of the migrants of urban origin.

By urban migrants, we mean individuals who, within the previous 5 years of the survey, left an urban district or a small town.

We obtained complete matrices of aggregated migrations between and within Chinese provinces over the three periods 1985-1990, 1990-1995 and 1995-2000.

The dataset has four shortcomings.

First, Xizang (Tibet) province was not covered in the 1990 census, so that we only know the number of migrants from Xizang that live in other provinces in 1990 but not the number of migrants from other provinces that moved to Xizang. In the same manner, we do not have information on migration within Xizang. As a consequence, Xizang intra-provincial migrations and Xizang inflows are not taken into consideration in the empirical estimations for the first sub-period 1985-1990.

Second, we know from which province the migrants come from but do not have

precise indications on the exact location. As such we will consider the distance between departure and arrival locations to be the distance between the capital cities of the respective provinces for inter-provincial migrations.

Third, no data are available on when the migration exactly took place: it may have occurred any time within the five year-periods. We argue that potential migrants do not react immediately to provincial wage differentials and need time to compare job opportunities and take their decision. We use average of determinants of relative expected utility over the five year-periods preceding the survey: that is over 1985-1989 for migration flows which occurred between 1985 and 1990, over 1990-1994 for migration flows which occurred between 1990 and 1995 and over over 1995-1999 for migration flows which occurred between 1995 and 2000.

The definition of migration in the 2000 population has evolved from that in the two previous surveys. In the 1990 population census and the Population survey of 1995, migrations within counties or within municipalities are not taken into consideration. In general, the capital city of the county is the urban center that is the closer for the rural workers. Short-distance migrations within each county are much more frequent than those to the outside of the county. In China, the county (or municipality) is an administrative unit relatively independent and autonomous with its specific complete administrative system. Migrations outside of the county correspond to more formal and more permanent mobility of workers. In the 2000 population census, migration is defined as a change of residence even between townships, urban districts or small towns. As such the number of migrants covered by the 2000 Census is magnified, as it appeared in table 1.

Distances

Bilateral distances between provinces are measured on the basis of real distance by road in kilometers between their capital cities following the quickest route based on very detailed maps. This measure which takes into consideration the reality of geographical space (mountains, lakes, density and quality of road infrastructures) is surely a better proxy than Great Circle distance that is generally used in economic geography or trade studies.

Other determinants of expected utility

Labor market conditions are apprehended through indicators of job opportunities, size, degree of fragmentation and diversification into a knowledge based economy.

We will take into account the influence of provincial labor market fragmentation based on an indicator of the proportion of temporary workers. We also test the

impact the development of the services industry through a measure of the GDP share that derives from the tertiary sector.

Provincial population, wage, GDP and unemployment figures are extracted from *China Statistical Yearbooks* published by the National Bureau of Statistics. Data on the number of temporary inhabitants are taken from the Population census and survey of 1990, 1995 and 2000.

We compute average of these determinants over the five years preceding the survey: that is over 1985-1989 for migration flows which occurred between 1985 and 1990, over 1990-1994 for migration flows which occurred between 1990 and 1995 and over over 1995-1999 for migration flows which occurred between 1995 and 2000.

When we focus on the specific behaviour of migrants of urban origin, we use urban nominal incomes to proxy for their wage.

Correcting for possible endogeneity of the openness measure

A province's trade-to-GDP ratio may be endogenous. As argued by Wei and Yu (2001), the ratio may go up as a result of, rather than as a cause for a province's economic growth or developing labor force (in part fueled by immigration).

To deal with this problem, we adopt a technique that was pioneered by Frankel and Romer (1999), and has subsequently been employed by Irwin and Tervio (2000), Wei (2000) and Wei and Yu (2001). The basic idea is that a country's volume of trade is related to its geography (e.g. proximity to other major trading nations in the world), but its geography is unlikely to be influenced by its income or its labor force dynamism. In our study, we take advantage of the special geographic features of the Chinese territory to construct an instrumental variable for a province engagement in international trade. As argued earlier, in China, provincial heterogeneity in terms of openness largely derives from their specific access to major seaports and their strategic position with respect to their international partners.

We therefore rely on four indicators as instrumental variables for openness of a province. We use the distances from the province's capital city to the closest seaport as well as to the biggest ports for international trade in China (Shanghai and Guangzhou). The last indicator is the existence of a common land border with an international partner.

4.2 Results

We ensure that equation (4) is estimated correctly and verify that no problem of multicollinearity exists. High correlation between some or all right hand side

variables does not prevent estimators from being BLUE but induce high variances and therefore low t-ratios. We compute Variance Inflation Factor (VIF) for the independent variables specified in the fitted model. A commonly used rule of thumb is to treat any VIF in excess of 10 as evidence of multicollinearity. All VIF fall behind 2⁴. This result tends not to refute the reliability of our estimates.

Regressions results are reported in table 2 in Appendix. Estimations are run separately for each datasubset: 1985-1990, 1990-1995 and 1995-2000.

We estimate equation (4) by Instrumental variables (2SLS) regression. The Huber/White/Sandwich estimator of variance is used to correct potential heteroskedasticity. The usual practice in applied statistical work is to employ all the regressors in the main regression other than openness as instrumental variables alongside the dedicated structural instruments. As, we ought to be concerned that some of those regressors (especially those reflecting labor market conditions) are themselves susceptible to be endogenous with respect to observed openness, we conducted 2SLS with geography variables as the only regressors in the first-stage regression. In any case, the results following the traditional method (not reported to save space) are broadly similar to those in table 2.

The first column proceeds to the estimation of equation (4) on the entire dataset, using a panel regression with fixed effects by period. The three following columns report the basic estimations for the three sub-periods. They consider the impact of openness beside that of labor market conditions like wage and unemployment. The next three columns test the robustness of the results and investigate the potential differential impact of openness depending on the fragmentation of the labor market, apprehended through the proportion of temporary inhabitants. The last column investigate the impact of openness as it interacts with the degree of diversification of economy.

The explanatory power of our estimations is quite high as R^2 almost reaches 30% in the yearly fixed effects estimations and lies above the figure of 40% for the regressions on the individual periods.

The coefficient on the differential of population between the departure and arrival provinces is positive and significant. It underlines that migrants rather move towards more populous provinces. This aspect corresponds to an “agglomeration effect” as more population largely reflects more market potential and therefore constitutes an indicator of market dynamism.

⁴The variance inflation factor associated with the i^{th} variable is equal to $\frac{1}{1-R_i^2}$ where R_i^2 is the R-squared from the regression of the i^{th} explanatory variable on all of the other explanatory variables.

Our estimations apprehend the costs of migration through two indicators. The variable of distance reflects the costs that are proportional to the distance between the locations of origin and arrival while the dummy of common border captures the extra-cost of moving further away from the departure province than to neighboring provinces.

Coefficients on distance appear with the expected negative sign. Migration flows decrease significantly with the distance of migration. This result is coherent with the literature that emphasizes that increase in distance between the departure and the arrival destination of a migrant induces greater physic costs of moving but also reflects reductions in the quality and amount of information as networks of contacts diminish. The influence of distance is quite high as coefficients are close to one in absolute value. It is moreover directly comparable to the value obtained by Crozet (2002) for international migrations between several European countries. The author finds values ranging between -0.5 (Great Britain) and -0.9 (Netherlands). These results confirm the overall high migration costs and the small degree of mobility of Chinese workers.

Migration costs turn out to be even more important for long distance migrations (*i.e.* for migrations between non-adjacent provinces). Indeed, the dummy variable which takes the value of one for neighboring province enters with a positive sign, underlining that extra-costs apply to migrants who move particularly far from the departure location.

Indicators of migration costs decrease significantly at the 1% confidence level between the two sub-periods 1990-1995 and 1995-2000 (columns 3 and 4), in coherence with the relaxation of migration impediments reviewed in section 2.

Our model estimations confirm that migration choices are driven by spatial job opportunity search. Migrants are attracted to provinces with high expected income. Our results emphasize that everything else equal, migrants tend to favor destinations where they expect to find better job finding probability based on the observation of past values of unemployment. Significant and positive coefficients are found on the destination location's wage. The rate of unemployment in the destination location enters significantly with the expected negative sign.

Looking at the labor market conditions in the origin location, the negative sign found on the unemployment rate and on the wage in the first sub-period 1990-1995 and second sub-period 1995-2000 respectively suggest that migrants suffered from financial constraints. Inhabitants that are confronted to poor living conditions (low income and unemployment) in their province of origin are less in a position to incur migration costs and engage into migration. The appearance of a positive impact of the unemployment rate of the location of origin in the last sub-period 1995-2000

could indicate a relaxation of financial constraints. Low job opportunities in the location of origin do not indicate an inability to bear migration costs anylonger but rather correspond to a higher motivation to move out. This evolution is in line with the deterioration of labor market conditions and the building up of redundant workers in relation with advances of enterprises restructuration.

Our indicator of engagement in international trade enters significantly in our regressions. Globalization has a negative impact on the motivation of workers to move out of their province of residence and a positive impact on the migration flows received by a province of destination. It reflects that openness constitutes an attraction force both for the place of origin and the location of arrival. On the one hand, engagement in international trade lessen the incentives to leave of the local labor force and on the other hand, it attracts migrants from other parts of the country. Our results emphasize that globalization reinforces the capacity of absorption of workers both in their province of origin and in the province of destination if they decide to migrate.

The fact that openness of a province tends to limit the magnitude of migration outflow is coherent with the fact that increased liberalization and openness is associated in China with rural industrialization. Globalization impacts the Chinese rural areas by accelerating the growth of the industrial firms in addition to affecting the agriculture sector directly. Due to the top leadership's concern about possible over-population in the cities, from the very start of the reform, two decades ago, the government implemented the policy of "li tu bu li xiang" that is of "leaving-the-farm-work-but-not-the-farmland". Openness therefore has favored the development of factories in rural townships and villages. The spectacular rise of what are known as the "township-and-village enterprises" (TVEs) produced increased job opportunities for workers that otherwise would have likely engage in interprovincial migration.

The double impact of retention and attraction of openness strengthens over time. Coefficients on the openness of both departure and destination provinces increase in absolute value at the 1% confidence level between the first sub-periods 1985-1990 and the last one 1995-2000.

Columns 5 to 7 investigate the potentiality of a heterogenous response of migration to international openness depending on the fragmentation of the labor market. Interaction terms between openness and the proportion of temporary inhabitants of provinces are introduced for each sub-period. We argue that the higher the share of temporary inhabitants in a province, the more the labor market is fragmented and therefore the higher the competition for jobs.

Results emphasize that the proportion of temporary inhabitants constitutes

an additional motivation for leaving the province of origin that strengthens over time. This characteristic may reflect the increasing competition between redundant rural workers that have left their villages and have crowded the neighboring cities. This greater competition may materialized in higher social tensions between the permanent residents and the migrants who are often accused of threatening security. Higher market fragmentation may also result in the worsening of wage and labor conditions for unskilled labour.

Migrants may therefore decide to engage in further away inter-provincial migrations. On the opposite, the higher our indicator of labor market fragmentation of the destination province in the last period, 1995-2000, the lower the flows of in-migrants received. This feature may correspond to the deterioration the labor market conditions in the provinces that traditionally attract migrants. Issues of unemployment, especially in cities, are more and more acute in coastal provinces. Moreover, distrust is growing vis-a-vis workers coming from other provinces as a result of tensions on the job market and increased insecurity.

The last column investigates the specific interaction between openness and the diversification of the labor market. The percentage that the tertiary sector contributes to the GDP can be interpreted as the move towards a knowledge based economy. Greater development of activities such as retail, culture or finance, signals a job larger potential for white collar jobs as well as better amenities available for migrants. Our results tend to validate these hypotheses as migrants rather move towards more diversified economy. Moreover, the attraction power of globalization is magnified by the availability of services.

As this aspect mostly applies to the context of cities, we push further our investigation in focusing on the subsample of the migrants of urban origin. We argue that these migrants are certainly better qualified workers and that they may consider the quality of amenities beside salaries in each of alternative regions in the process of making the migration decision.

Results on the specific behaviour of migrants coming from urban areas appear in table 3.

The first three columns reproduce the estimations made on the entire sample for the three sub-periods. As in table 2, we consider the impact of openness of migration dynamics beside that of labor market conditions like wage and unemployment. Columns 4 to 6 investigate the potentiality of an heterogenous response of migration flows of urban workers to international openness depending on the diversification of the economy.

We test the potential differential impact of openness depending on the development of the services industry. We argue that the higher the contribution of the

tertiary sector in the provincial GDP, the more advanced the provincial economy.

Results obtained on the dynamics of migrants leaving urban areas are very similar to those obtained on the entire sample. International openness is an important driving force of urban migrants. Openness of a province tends to limit the magnitude of migration outflow while at the same time it amplifies the inflow of urban migrants from outside.

These features are coherent with the fact that increased liberalization and openness is associated in Chinese cities with development of attractive jobs in joint ventures and the generalization of western life style and entertainment.

It seems however that the action of globalization as a retention force has declined over time. Its impact as an attraction force has on the opposite increased between the two sub-periods (1985-1990 and 1990-1995) while it has reduced afterwards. These evolution may be consistent with the degradation of the employment condition in cities. Our results finally confirm that diversification into a knowledge based economy reinforces the attractive impact of openness for urban migrants. The development of services constitutes an attraction force for migrants coming from other cities as it corresponds to greater job opportunities and more developed amenities enjoyable by residents. It also strengthens the impact of globalization. This last effect may relate to the prospective development of high-profile jobs in the tertiary sector with the continuation of international opening. The preliminary development of services in a province induces that globalization does not only correspond to the creation of blue-collar jobs in export-oriented assembling facilities but also rather the development of executive positions in dynamic activities such as banking, insurance, marketing... It reflects the qualitative impact of international opening on the job market in addition to the quantitative one.

The magnification effect of economic diversification on the attraction power of trade openness for migrants strengthens over time as underlined by the significant increase of the coefficients on the interacted term between openness and diversification at the 1% confidence level between the first sub-periods 1985-1990 and the last one 1995-2000.

5 Conclusion

This paper presents a case study of the impact of globalization on internal migrations using data on Chinese provinces.

We rely on a model that mainly rests on the logic that workers move in order to obtain greater incomes. We take into account the potential endogeneity of globalization based on the geography-based instrumentation technique pioneered

by Frankel and Romer (1999).

The opening-up policy launched by Chinese authorities at the end of the 1970s, has resulted in widening regional disparities in terms of income and job opportunities that motivated large movements of workers from depressed areas to those offering more prosperous prospects.

Our results, based on migrations flows registered on the 1985-2000 period, emphasize that migration choices in China are driven by spatial job opportunity search: differentials of wage and job opportunities prompt redundant workers to engage into migration. Globalization reinforces the capacity of absorption of workers in a given province so that it reduces their incentives to engage into inter-provincial migration. In addition, once workers decide to move outside of their location of origin, they tend to be attracted to outward-oriented provinces. This phenomenon is however weakened by the degree of labor market fragmentation. Alternatively, diversification into a knowledge based economy reinforces the attractive impact of openness for urban migrants. This last effect may reflect that globalization does not only correspond to the creation of low-skilled blue-collar jobs in export-oriented assembling facilities but also heralds the development of executive positions in dynamic service activities.

Table 2: Migration dynamics

Dependent Variable: $\ln \frac{migr_{ji}}{migr_{jj}}$								
Instrumental variables (2SLS) regression								
Migration period	1	2	3	4	5	6	7	8
Differential of population size	0.46*** (0.03)	0.56*** (0.05)	0.54*** (0.06)	0.40*** (0.09)	0.60*** (0.06)	0.62*** (0.08)	0.50*** (0.03)	0.56*** (0.03)
Wage of location of origin	-0.94*** (0.14)	-0.07 (0.35)	-3.18*** (0.49)	-0.21 (0.20)	-0.29 (0.37)	-2.78*** (0.48)	0.38** (0.19)	-0.06 (0.19)
Wage of location of destination	1.75*** (0.17)	2.05*** (0.39)	2.20*** (0.45)	1.58*** (0.17)	1.93*** (0.42)	2.52*** (0.47)	1.55*** (0.17)	1.85*** (0.19)
Distance	-1.07*** (0.06)	-0.75*** (0.09)	-1.38*** (0.14)	-0.95*** (0.08)	-0.80*** (0.09)	-1.31*** (0.13)	-0.94*** (0.07)	-1.08*** (0.06)
Common border	0.97*** (0.10)	1.11*** (0.15)	0.96*** (0.19)	0.90*** (0.13)	0.97*** (0.14)	0.97*** (0.18)	0.88*** (0.13)	0.94*** (0.10)
Unemployment rate of location of origin	-0.15** (0.07)	-1.06*** (0.13)	-0.13 (0.15)	0.56*** (0.09)	-0.99*** (0.13)	-0.15 (0.15)	0.08 (0.10)	-0.11* (0.07)
Unemployment rate of location of dest.	-0.59*** (0.07)	-0.55*** (0.11)	-0.49*** (0.14)	-0.68*** (0.09)	-0.47*** (0.10)	-0.47*** (0.14)	-0.58*** (0.09)	-0.62*** (0.07)
Openness rate of location of origin	-0.47*** (0.06)	-0.29*** (0.09)	-0.39*** (0.14)	-0.59*** (0.07)	-0.14* (0.08)	-0.69*** (0.15)	-1.12*** (0.08)	-1.05*** (0.25)
Openness rate of location of dest.	0.27*** (0.07)	0.16* (0.09)	0.29** (0.12)	0.31*** (0.07)	0.25*** (0.09)	0.23* (0.14)	0.41*** (0.08)	2.12*** (0.25)
Interaction openness & fragmentation origin					0.00 (0.05)	0.36*** (0.08)	0.46*** (0.04)	
Interaction openness & fragmentation dest.					-0.08 (0.06)	0.04 (0.09)	-0.09** (0.05)	
Differential size of tertiary sector								3.63*** (0.45)
Interaction openness & tertiary sector origin								-0.55*** (0.21)
Interaction openness & tertiary sector dest.								1.60*** (0.21)
Yearly Fixed effects	yes							yes
Obs. Nb.	2552	812	870	870	756	870	870	2552
R ²	0.29	0.47	0.42	0.54	0.48	0.43	0.59	0.27
p-value Hausman test	37.28***	31.47***	45.89***	64.59***	21.98***	-58.69	-28.70	-49.90
Instr. First-stage F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Heteroskedastic consistent standard errors in parentheses, with ***, ** and *, denoting the significance at 1, 5 and 10% level. The null hypothesis for the Hausman test is that the coefficients in the OLS and IV regressions are not different systematically. A rejection of the null implies that the OLS estimate is biased.

First-stage F is the F-statistic for the null hypothesis that the coefficients on the instruments are zero.

Table 3: Migration dynamics

Dependent Variable: $\ln \frac{migr_{ji}}{migr_{jj}}$, migrants of urban origin						
Instrumental variables (2SLS) regression						
Migration period	1	2	3	4	5	6
Differential of population size	0.71*** (0.04)	0.57*** (0.06)	0.53*** (0.03)	0.67*** (0.05)	0.78*** (0.08)	0.67*** (0.04)
Wage of location of origin	1.66*** (0.35)	-1.14*** (0.44)	-0.27 (0.14)	1.97*** (0.35)	-0.27 (0.36)	0.22 (0.17)
Wage of location of destination	2.37*** (0.33)	2.36*** (0.44)	1.65*** (0.14)	1.18** (0.46)	2.88*** (0.48)	1.78*** (0.17)
Distance	-0.84*** (0.08)	-1.17*** (0.14)	-0.78*** (0.087)	-0.77*** (0.08)	-1.14*** (0.14)	-0.76*** (0.06)
Common border	0.73*** (0.13)	0.77*** (0.20)	0.77*** (0.11)	0.79*** (0.13)	0.76*** (0.20)	0.75*** (0.11)
Unemployment rate of location of origin	-0.92*** (0.11)	-0.04 (0.14)	0.47*** (0.08)	-0.84*** (0.11)	0.04 (0.14)	0.25*** (0.09)
Unemployment rate of location of destination	-0.63*** (0.09)	-0.61*** (0.14)	-0.66*** (0.08)	-0.98*** (0.11)	-0.71*** (0.15)	-0.65*** (0.09)
Openness rate of location of origin	-0.44*** (0.09)	-0.35*** (0.13)	-0.37*** (0.07)	-3.84*** (0.61)	-2.69*** (0.74)	-1.89*** (0.37)
Openness rate of location of destination	0.19*** (0.07)	0.36*** (0.12)	0.22*** (0.06)	2.19*** (0.61)	4.29*** (0.74)	2.78*** (0.38)
Differential size of tertiary sector				4.66*** (0.97)	7.71*** (1.36)	5.84*** (0.86)
Interaction openness size of tertiary sector location of origin				-2.48*** (0.42)	-2.08*** (0.61)	-1.60*** (0.35)
Interaction openness size of tertiary sector location of destination				1.50*** (0.45)	3.48*** (0.63)	2.58*** (0.37)
Obs. Nb.	812	870	870	756	870	870
R ²	0.57	0.39	0.60	0.59	0.43	0.63
p-value for Hausman test	60.99***	20.61***	90.84***	34.49***	-14.06	372.02***
First-stage F on the instruments	0.00	0.00	0.00	0.00	0.00	0.00

Heteroskedastic consistent standard errors in parentheses, with ***, ** and *, denoting the significance at 1, 5 and 10% level. The null hypothesis for the Hausman test is that the coefficients in the OLS and the IV regressions are not different systematically.

A rejection of the null implies that the OLS estimate is biased. First-stage F is the F-statistic for the null hypothesis that the coefficients on the instruments are zero.

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