

# **Fiscal Impact of the Interprovincial Floating Population in the Developed Provinces of China**

YUTIAN YANG\*, *Rutgers University*

YANNIS IOANNIDES\*\* *Department of Economics, Tufts University*

**Abstract:** Floating Population means internal migrants distinguished from the Household Population by the Chinese Hukou-system. These people migrate from undeveloped to developed regions to live as permanent residents but do not have Hukou registered in the place they wish to live in. Our research shows that, based on the data for 2009: (i) a person's Hukou Type and their economic status are significantly correlated at year 2009; (ii) the marginal fiscal impact of the Floating Population with Urban Hukou is positive but that of those with Rural Hukou although hard to assess is possibly positive as well. The problems we address are relevant for other countries as well, and so are the choices we have made in order to overcome lack of data.

**Key word:** Interprovincial Floating Population, Hukou, tax, public goods, fiscal impact

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\*Yutian Yang: Department of Economics, Rutgers University, New Brunswick, NJ, 08901, USA. Email: [yutian.yang@rutgers.edu](mailto:yutian.yang@rutgers.edu)

\*\*Address for Correspondence:

\*\*Yannis Ioannides: Department of Economics, Tufts University, Medford, MA 02155, USA. Fax:+1 617 627 3917. Email: [yannis.ioannides@tufts.edu](mailto:yannis.ioannides@tufts.edu)

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## 1. Introduction

China's accelerated industrialization has been driven by immigration from rural to urban areas and from developing to developed provinces. But China still keeps its Hukou-system as the legacy from its time as a planned economy to control the internal migration flows.

A **Hukou** is a record in the system of household. The record identifies a person as a legal resident of an area and includes identifying information such as name, parents, spouse, siblings and birth date. A person's Hukou is like a person's nationality. Normally, a person cannot change the type of his/her Hukou.

A person's Hukou is registered in an administrative area (town\|village\|city) when he/she is born. There are two types of Hukou: **Rural Hukou** and **Urban Hukou**. If the Hukou is registered in a rural administrative area such as a village, the person is most likely to have a Rural Hukou. There are some Rural Hukous registered in urban areas and some Urban Hukous registered in rural areas. But the proportion is relatively small (1% Census, 2005). For the person with Rural Hukou, we call him/her a **Rural Hukou person**. If the Hukou is registered in an urban administrative area such as a city, the person is most likely to have an Urban Hukou. We then call this person an **Urban Hukou person**. Normally, the location that the child's Hukou is registered in is the same as the location that the child's parents' Hukous are registered in, no matter where the child is born.

If some people live in a City A for more than 6 months but their Hukous are registered in a City B, they are then called **Floating Population**. And we say they have **non-local Hukou**. If some people living in City A and also have their Hukou registered in City A, they are called **Household Population**. We say that they have **local Hukou**.

If a person lives in a City A, Province 1 for more than 6 months but his/her Hukou is registered in City B, Province 2, then this person belongs to **Interprovincial Floating Population**. If a person lives in City A, Province 1 for more than 6 months but his/her Hukou is registered in City C, Province 1, then this person belongs to **Intraprovincial Floating Population**.

Given the above classifications, we further classify all the permanent residents into six

groups: Urban Hukou Interprovincial Floating Population (UInter), Rural Hukou Interprovincial Floating Population (RInter), Urban Hukou Intraprovincial Floating Population (UIntra), Rural Hukou Intraprovincial Floating Population (RIntra), Urban Hukou Household Population (UH) and Rural Hukou Household Population (RH). See Table 1.

**Table 1: Six Demographic Groups of Permanent Resident Classified by Type of Hukou**

	Hukou Registered in Other Province	Hukou Registered in Other Town/Country In the Province	Hukou Registered in the Resident Towns/Villages
Hukou Registered in Urban Location	Urban Hukou Interprovincial Floating Population (UInter)	Urban Hukou Intraprovincial Floating Population (UIntra)	Urban Hukou Household Population (UH)
Hukou Registered in Rural Location	Rural Hukou Interprovincial Floating Population (RInter)	Rural Hukou Intraprovincial Floating Population (RIntra)	Rural Hukou Household Population (RH)

There are ways to change the type of Hukou, that is, being employed by a local company, or marrying a person with local Hukou, or investing in local industry may help an individual get local Hukou. Once people in the Floating Population get a local Hukou, they are then regarded as Household Population.

Living in the area without local Hukou may have some disadvantages in receiving education, claiming public healthcare and pension, purchasing a house, or getting a job (Weiping Wu & Guixin Wang 2014). Such disadvantages may influence individuals' working and consumption behavior, which in turn affect how they contribute to and consume the public finance. And given that having a local Hukou has some advantages, the more rich and developed the place is, the harder it is for each person of Interprovincial Floating Population to get a local Hukou, since competition of getting a local Hukou is more fierce.

The present research focuses on the marginal fiscal impact of Interprovincial Floating Population. We define the marginal fiscal impact of an individual coming into a province as the change impacted upon the annual fiscal income and annual fiscal expenditure of the local government. But since it is impossible to get data on the marginal effect, we use the average effect as a proxy of marginal effect.

In view of the research by Christian Dustmann and Tommaso Frattini (2014) we apply two types of analysis. First, we use survey data from the China Family Panel Survey (CFPS) to assess the probability for each individual in different demographic groups (UInter, RInter,

UIntra, RIntra, UH, RH) to receive certain public social benefits (e.g., pension, healthcare, unemployment insurance), the amount of income of each individual in different demographic groups and the amount of consumption of each individual family in different demographic groups. Second, we calculate the difference in fiscal contributions made by the Floating Population and in the cost of public goods and in the fiscal cost of public services the Floating Population received in order to arrive at their net fiscal contribution. **However, given the lack of data, we only estimate the marginal fiscal contribution and cost in year 2009.**

The six provinces we pick for our estimation are Beijing, Shanghai, Tianjin, Guangdong, Zhejiang and Jiangsu. Among them, the first three are actually municipalities, which are very big cities with the administrative level of province. One reason we choose those six provinces is that they attract approximately 70% of the total Interprovincial Floating Population (2010 Census, 2010) in China. That means that the Interprovincial Floating Population in those provinces is quite representative. In addition, based on *The State of China's Cities (2009/2010)*, Guangtao Wang, Siliang Tao, e.g.), those six provinces are the only provinces that have reached or surpassed the level of mid-urbanization, thus allowing us to regard them as “Developed Provinces” among the 31 provinces in Mainland China.

## **2. Existing Research**

Our research is motivated by existing research on the Floating Population in China as well as other research on migrants elsewhere in the world. For example, the member countries of the European Union are experiencing a rapid influx of immigrants that has become a major political issue.

### **2.1. Status and behavior of Floating Population**

Many internal migrants successfully re-register their Hukou at the place they move to and get local Hukou. But there are still many internal migrants who fail to change their Hukou (Cindy Fan, 1999, Lina Song, John Knight and Jia Huaibin 1999, Fang Cai and Dewen Wang, 2005). They are the ones identified as Floating Population in our research. They fail to change their type of Hukou because of many reasons. Researchers see their common features



through the fact that they belong to Floating Population. Because Hukou is linked to some rights and advantages, being a member of Floating Population in turn affects their behavior.

For the developed regions accepting Floating Population, Floating Population are the main source of cheap labor for industrialization (Lina Song, John Kight, Jia Huaibin, 1999). The people of Floating Population are mostly economic migrants, single and young (aged from 15 to 29) (Cindy Fan 1996 and Chunguang Wang 2001). Most of them have low education level. “In 2010, three fourths of migrant workers are unskilled with a junior high school diploma or below” (Fang Cai and Yang Du, 2011). But among these internal migrants, those with Urban Hukou have significantly higher labor income and higher education level than the Household Population with Urban Hukou (Guihua Xie 2012).

Compared to the Household Population with Urban Hukou or Rural Hukou, people of Floating Population have lower probability of claiming social benefits. And having a rural Hukou significantly lowers that probability. Researchers find that only 16.2% of the Floating Population with Rural Hukou and 68.5% of the Floating Population with Urban Hukou have health insurance, while 76.5% of the Household Population with Rural Hukou and 86.2% of the Household Population with Urban Hukou have health insurance (Weiping Wu and Guixin Wang, 2014). The situation is similar when it comes to unemployment insurance and pension (Weiping Wu and Guixin Wang, 2014). In addition, if a person works in a state-owned sector, his/her probability of claiming social benefits will be higher (Weiping Wu and Guixin Wang, 2014).

Researchers also find that most Floating Population do not have a high propensity to stay in the receiving regions. In rural China, “the countryside continues to be the basis of economic security for China’s peasant migrants and their families” (Cindy Fan and Wenfei Wang, 2008). Circular movement of peasant migrants is a long-term practice (Cindy Fan and Wenfei Wang, 2008). In addition, “there is no significant difference in the intention of stay in the city among different age groups and different education level groups, while the ones with more migrant experience and family with children were more likely to stay.” (Cindy Fan, 2011)

The abilities, economic status and desire of the Floating Population are correlated to these people's consumption behavior. The members of Floating Population who migrate from rural to urban areas have much lower living standards than the Household Population in the city (Simon Appleton, Lina Song, 2005). Their ratio of expenditure versus income is very low (only 53%, while the Household Population in cities have rate of 72.5%), because they need to save money to support their family in their hometown or save money for themselves and plan to spend the money when they go back to their hometown after several years (Siqi Zheng, Fenjie Long, C. Cindy Fan, and Yizhen Gu, 2009).

## ***2.2 Public Finance and Floating Population***

Since there is little research regarding the fiscal impact of Interprovincial Floating Population in China, we adopt methods used by researchers who have analyzed the fiscal impact of immigrants in other countries.

Firstly, researchers analyze how fiscal income or fiscal expenditure are generated or spent respectively. For the income, for example, each individual pays labor-income-tax based on tax rates (National Bureau Statistic of China, 2013). However, it is more difficult to calculate the value added tax and consumption tax, because it is hard to calculate the ratio of value added tax contained in the price. It is also hard to calculate the non-tax fiscal income such as the administration fee because its components vary from areas to areas. The expenditures, such as fiscal expenditures on medical care, education and social security are spent on each individual who claimed such benefits. Analysis based on UK data show that resources for medical care are distributed based on the age structure and have nothing to do with an individual's immigrant status (Jonathan Wadsworth, 2013). Other studies of Chinese Floating Population show that only a few people of Floating Population are covered by the public insurance system (Weiping Wu 2002, Ingrid Nielsen, Chris Nyland, Russell Smyth, Mingqiong Zhang, Cherrie Jihua Zhu, 2005, Weiping Wu, Guixin Wang, 2014). Also, the fiscal expenditure on the education of children in the Floating Population is lower than those of Household Population with Urban Hukou. Although more than 96% of school-aged children of the Floating Population are legally educated during the age of compulsory

education (Rongcheng Duan, Lidan Lv, Pingzong Wang and Jing Guo, 2013), only 17.65% of the Interprovincial Floating children were able to study at public education institutions, while 71.48% and 6.67% of them had to study in public-private-mixed classes and private education institution (Yi Zhang and Xiaogang Zhou, 2012). This means that most children of Floating Population do not claim the benefit of fiscal expenditure on education or claim less than the children of Household Population.

Secondly, fiscal income and expenditures are classified into different categories based on their allocation. For example, when analyzing related issues in UK, researchers have used seven categories of fiscal income and eight categories of fiscal expenditure (Christian Dustmann, Tommaso Frattini and Caroline Halls, 2010, 2014). Among the categories of fiscal expenditure, they define some categories as “pure public goods”, and some other categories as “congestible public goods” (Christian Dustmann, Tommaso Frattini and Caroline Halls, 2010, 2014). The marginal cost of providing “pure public goods” to an additional individual is zero, while the marginal cost of providing “pure public goods” to an additional incoming immigrant is not zero. Then they apportion the expenditure on congestible public goods to each individual in each group by means of certain rules respectively. In this way, they are able to calculate, on average, how much is spent on an immigrant, and use the result for the average cost as the proxy of the marginal cost. For example, when calculating the cost of public insurance of each immigrant, they apportion the annual total expenditure on public insurance to immigrants and natives, respectively, based on their total population of them and the proportion of people claiming social insurance.

### **3. Data**

#### **3.1. Survey Data:**

The China Family Panel Study (CFPS), version 2010, is funded by Program 985 of Peking University, and carried out by the Institution of Social Science Survey of Peking University. The interviewees report the information based on the facts of year 2009.

The China Family Panel Study (CFPS) is the primary data source in our estimation. The data are annual and longitudinal (but we only use the survey of 2010) and generated by

face-to-face interview. It is unfortunate that we cannot make full use of the longitudinal structure because we only focus on year 2009. The survey took place in Mainland China and recorded the characteristics of the interviewed families and individuals, especially their Hukou status, and economic, demographic, education-related and health-related characteristics. It covers the permanent residents age from 0 to 101. Since we only focus on the 6 most developed provinces, we drop the observations of individuals and families not interviewed in the six selected provinces. After dropping other irrelevant observations, our database includes 9577 individual level observations and 3327 family level observations. When we perform the individual level or family level analysis, we mostly rely on the information provided by CFPS except when calculating education cost.

### **3.2. Macro-Data:**

(a) The Local Government Public Finance Income and Expenditure (Beijing, Shanghai, Tianjin, Guangdong, Zhejiang, Jiangsu), Version 2009, computed by National Bureau of Statistics of China in year 2010, reports amounts of fiscal expenditures and income.

(b) Summary of 2010 Census Data, collected during 2010

The National Bureau of Statistics of China reports the population of permanent residents, Interprovincial Floating Population, Intraprovincial Floating Population, people with Urban Hukou, People with Rural Hukou in each of the six provinces for 2010.

## **4. Preliminary Settings and Imputations**

Our evaluation of the marginal fiscal effect of Interprovincial Floating Population typically assigns to each individual his/her estimated tax and non-tax contribution and the expenditures in benefit payments and public services received in year 2009. In the following sections, we show precisely how our data are processed and what assumptions we make in order to appropriately account for missing information.

### **4.1. Marginal Fiscal Effect and Average Fiscal Effect**

To estimate the fiscal impact of Interprovincial Floating Population, we need to estimate the change in the income and expenditure of the local government incurred when an Interprovincial Floating individual comes into the region as a permanent resident (defined as

staying longer than 6 months). Since there are no data on the marginal fiscal effect, we use the average fiscal effect as a proxy of the marginal fiscal effect. The average effect of an individual is calculated by apportioning the fiscal income and cost to each individual. Because there is a large fixed cost for providing public goods, the average fiscal cost is always larger than the marginal fiscal cost. Our estimation will probably overestimate the fiscal cost of the Interprovincial Floating Population. And overestimating the fiscal cost leads to underestimation of net fiscal contribution. Knowing this fact, we choose to consistently underestimate the net fiscal contribution of the Interprovincial Floating Population. It means that when we calculate their fiscal contribution, we tend to underestimate their contribution; when we calculate their fiscal cost, we tend to overestimate their fiscal cost. By doing so, if the net fiscal contribution of an individual is positive, we can then conclude that his/her marginal fiscal impact is definitely positive.

#### ***4.2. Capital Income Related Revenue***

Some corporation-related fiscal revenues are not taken into consideration when we calculate the contribution of Interprovincial Floating Population. Corporation-related fiscal revenues means are taxes or fees paid only or mostly by companies. Although Christian Dustmann and Tommaso Frattini (2014) attribute such revenues to the people who own companies or shares of companies when estimating the immigration effect in the UK, we do not apply the same approach in our research. That is, because the marginal fiscal contribution of holding one unit of share is probably smaller than the average fiscal contribution of holding one unit of share, if we assign the fiscal revenues of capital equally to each individual holding local company or share of local company, we would be overestimating the marginal fiscal contribution, since the outcome we get is actually average fiscal contribution and, for consistency, we tend to underestimate the net fiscal contribution. In this case, to adhere to our notion, we have to assume their marginal contribution to be zero.

#### ***4.3. Net Fiscal Contribution and the Deficit***

The sign of net contribution of each individual member of the Floating Population is not

necessarily the same as the sign of the local government's surplus. When the local government runs a deficit, the net fiscal contribution of an individual of a demographic group may not be negative. The converse is also true. It is possible because we will not attribute all fiscal income or expenditure equally to each individual. Especially when it comes to the Floating Population, there are expenditures on "pure public goods" that are not affected by increases in their number; there is much lower expenditure on education on each individual of Floating Population than those spent on each household individual.

#### **4.4. Public Goods**

Providing public goods and services are the main expenditure of a local government. In our computation, we distinguish between two types of public goods and services: "pure public good" and "congestible public goods". "Pure public goods" are similar as the classical concept of public goods, which are non-rival in consumption and have zero marginal cost for providing "pure public goods" to one more individual of Floating Population. "Congestible public goods" are rival in consumption. The marginal cost of providing them is more than zero but smaller than the average cost, because there is fixed cost for providing "congestible public goods".

Given that the cost of providing "pure public goods" to one more individual of Floating Population is zero, the Floating Population's marginal fiscal impact on the government's expenditure of "pure public goods" can be estimated as zero. And since the marginal cost of providing "congestible" public goods is more than zero, we use the average cost of each individual as a proxy of marginal fiscal on the government's expenditure of "congestible public goods". This procedure will probably overestimate the fiscal cost of Floating Population.

#### **4.5. Type of Family**

Some of the data we use are generated by family-level surveys, such as consumption. But since Hukou is an individual characteristic, it is possible that in a family, some members belong to Interprovincial Floating Population, while some members do not. In such case, we identify the type of Hukou of the interviewed family according to the type of Hukou of the

interviewee who provides answer to the family-level questionnaire. For example, if the interviewee has Non-Local Urban Hukou, then we say the family belongs to Urban Hukou Floating Population. We do so because we find that families with different Hukous only account for less than 3% of the families of in our survey data, which has little influence on our estimation. The ratio is small because the Hukou of one person has strong correlation with the Hukou with his/her parents, spouse and children. If a family live together, their Hukous will probably be recorded on one book named Hukouben (户口本).

## **5. Basic Imputations**

### **5.1. Population**

Firstly, we need to know the exact population of each demographic group in year 2009. The data we have are the provincial level summary data of the census made for year 2010. As we said in the previous section, we divide the permanent residents into 6 demographic groups (See Table 1). By computation, the data tell us the Interprovincial Floating Population and the population of permanent residents in the six provinces. As we said previously, we assume the populations of each demographic group in year 2009 and in year 2010 are similar.

The summary of the census data of the Interprovincial Floating Population also tells us the administrative unit that the individual's Hukou is registered in. There are three kinds of administrative units—township (乡), villager committee (村委会) of town, resident committee (居委会) of town and street. Hukous registered in township and villager committees are mostly Rural Hukous, and in resident committee and streets are mostly Urban Hukous. Only a few Urban Hukous are registered in township and villager committee of town, and the only a few Rural Hukous are registered in resident committee of town and street. These minorities exist for varies of reasons. For example, if a woman with Urban Hukou marries a man with Rural Hukou, she may choose to re-register in the township or villager committee, where her husband's Hukou is registered, but the type of her Hukou remains to be Urban Hukou. From the summary of the One Percent Census Data (2005), we know the Urban Hukous and Rural Hukous shares of total number of Hukous registered in the respective administrative unit in China. We then use this country-level share to impute the

population of the six demographic groups in each of the six provinces. Since the evidence of the proportion comes from data of 2005 and we want to analyze issues around 2010, we assume that the ratio did not change much over the 5 years.

Let the ratio of the number of Urban Hukous to the number of all Hukous registered in township, villager committees of town, resident committee of town and in street to be a ( $0 < a < 1$ ), b ( $0 < b < 1$ ), c ( $0 < c < 1$ ) and d ( $0 < d < 1$ ), respectively. Then the ratios of Rural Hukou to all Hukou registered in these places are (1-a), (1-b), (1-c) and (1-d), respectively. In addition, we know the number of Hukous of Interprovincial Floating Population registered in each administrative unit. In Province i ( $i=1, 2, 3, 4, 5, 6$ ), let  $T_i$  denote number of Floating Population with their Hukou registered in township,  $V_i$ ,  $R_i$  and  $S_i$  denote number of those with their Hukou registered in villager committee of town, in resident committee of town and in street respectively. With these definitions, we write the number of Urban Hukou Interprovincial Floating Population (UInter) and Rural Hukou Interprovincial Floating Population (RInter) in Province i as :

$$UInter_i = aT_i + bV_i + cR_i + dS_i; \quad (1)$$

$$RInter_i = (1 - a)T_i + (1 - b)V_i + (1 - c)R_i + (1 - d)S_i. \quad (2)$$

We can apply a similar approach to calculate the population of other demographic groups.

**Table 2: Population of Each Demographic Group in Each Province and the Proportion of Them in the Population of Permanent Residents of Each Province**

Unit: 1000 People	UH		RH		UIntra		RIntra		UInter		RInter	
<b>Beijing</b>	8787	45%	1909	10%	1484	8%	387	2%	2250	11%	4795	24%
<b>Shanghai</b>	10739	47%	1264	5%	1622	7%	417	2%	1829	8%	7148	31%
<b>Tianjin</b>	6713	52%	2368	18%	702	5%	164	1%	710	5%	2281	18%
<b>Guangdong</b>	41724	40%	31188	30%	3971	4%	5922	6%	3367	3%	18132	17%
<b>Zhejiang</b>	17859	33%	16667	31%	3008	6%	5069	9%	1355	2%	10469	19%
<b>Jiangsu</b>	37610	48%	27368	35%	2833	4%	3469	4%	1161	1%	6218	8%
<b>Total</b>	<b>123432</b>	<b>42%</b>	<b>80764</b>	<b>28%</b>	<b>13620</b>	<b>5%</b>	<b>15427</b>	<b>5%</b>	<b>10672</b>	<b>4%</b>	<b>49043</b>	<b>17%</b>

Data Source: Census data 2010, 1% Census data 2005. Given that our estimation is made on year 2009, we assume all the values we get from the basic data are similar to the real values of year 2009.

From Table 2, only 4% of permanent residents are Urban Hukou Interprovincial Floating Population, while 17% of permanent residents belong to Rural Hukou Interprovincial



Floating Population. There can be two explanations for such difference. If the Floating Population with Rural Hukou is larger, the difference in welfare service between rural area and urban area is larger, then welfare services between different urban areas would vary more, and the people born in the rural areas may have stronger motivation to improve their situation by migration than the urban people. The second reason is, as Cindy Fan argued, it is “very difficult to change Rural Hukou into Urban Hukou”. The main barrier for the Rural Hukou Interprovincial Floating Population to become Urban Hukou Household Population is that they have Rural Hukou. It is much easier for Urban Hukou Interprovincial Floating Population to re-register their Hukou locally in order to become members of Urban Hukou Household Population.

## **5.2. Number of Students**

Following Christian Dustmann and Tommaso Frattini (2014), we associate the education cost entirely with the people studying at publicly subsidized education institutions. The National Bureau of Statistics of the People’s Republic of China (NBSC) reports the number of students studying in kindergartens, primary schools, junior high schools, senior high schools and professional schools in each province.

However, in our research, the students of universities, colleges, and secondary professional high schools who came from other provinces are not regarded as Interprovincial Floating Population. That is, when most of them enroll, their Hukou are re-registered locally in the area where they study. Thus in the census they are identified as Household Population. As a result, when we talk about Interprovincial Floating Population at school, we are referring to those at kindergarten, primary school, junior high school and senior high school in the selected provinces.

To figure out how many students of Interprovincial Floating Population are at school, we need to make some assumptions. Since we only have the national level data of students of Interprovincial Floating Population, we first assume that the national level statistic we use is similar to the six-provincial level statistic. This assumption is reasonable and unlikely to cause severe bias, because the Interprovincial Floating Population in the six provinces we

work with account for more than 60% of the national total Interprovincial Floating Population. A second assumption we make is that the annual statistical data around year 2009 are similar to the annual statistic data of year 2009. For example, we refer to the statistical data of 2008 or 2007 or 2010 when the statistical data of 2009 is unavailable.

We know the population of students in each of the six provinces in year 2010 from the National Bureau of Statistics of the People’s Republic of China (NBSC). It provides the number of students in each education level per 100,000 permanent residents. From the summary of census data (2010), we know the total population of permanent residents in each of the six provinces. By multiplying them, we compute the total population of students studying in education institutions of each level. In the following analysis, we apply the concept of “school-age child” (学龄儿童), which is based on the Compulsory Education Law

School-Age-Child Category	Age Group	Education Institution	Length
Kindergarten	3~5	Kindergarten (Public & Non-Public)	3 years
Primary School	6~11	Primary School (Public & Non-Public)	6 years
Junior High School	12~14	Junior High School (Public & Non-Public)	3 years
Senior High School	15~17	Senior High School (Public & Non-Public)	3 years

of the People's Republic of China (2006) which defines the level of education a child should be receiving corresponding to his/her age. We did several modifications in the classification of each category of school-age child.

**Table 3: School-Age-Children Category**

Although based on the Compulsory Education Law of the People’s Republic of China, the age of starting primary-school education can be either 6 or 7, we assume children of Interprovincial Floating Population start at age 6 to simplify our calculation. Existing Research justifies that, in year 2010, more than 96% children of Interprovincial Floating Population aged fro 6 to 11 are at school (Rongcheng Duan, Lidan Lv, Zongping Wang, Jing Guo, 2013).

From The Report of Data of Floating Children in China (2014), we know that 19.65% of them belong to Urban Hukou Floating Population and 80.35% of them belong to Rural Hukou Floating Population. It also tells us the their age structure and how they are distributed among the six provinces. We make the assumption that the share of Interprovincial Floating Population and Intraprovincial Floating Population at school of each education level in each province obey the 19.65% to 80.35% ratio and the age structure of them is the same as the country-level age structure reported by The Report of Data of Floating Children (2014) in

China.

However, there are many students at ages 18 or 19 studying in senior high school, we have to make some assumptions to figure out the Floating Population at senior high school. Based on the laws in the six provinces, students have to go back to their Hukou-registered location to take the college entrance exam. In addition, Beijing, Shanghai, Tianjin and Jiangsu have set regulations to prevent the Interprovincial Floating children from entering local senior high schools. Thus, it is reasonable to assume that Interprovincial Floating Population at senior high school is no more than Interprovincial Floating Population at junior high school. In our analysis, we treated those two numbers as equal, which will probably overestimate the education cost on the Interprovincial Floating Population.

Then we calculate the number of children of Interprovincial Floating Population in kindergartens. Yueping Song and Long Li (2013) report that the proportion of children aged from 2 to 6 of Interprovincial Floating Population entering kindergarten. We just need to multiply the population of these children by the proportion to get the number of these children at kindergartens.

From previous research (2012, Yi Zhang & Xiaogang Zhou), the proportion of school-age children of Floating Population who did not complete the compulsory education (primary school & junior high school) is less than 2.5% in all the school-age children of Floating Population, in year 2010. Since this is a very small number we assume Interprovincial Floating school-age children receiving compulsory education to be 100%.

From data we know the Floating Population aged from 0 to 17 in each province as  $A_i$  ( $i=1, 2, 3, 4, 5, 6$ ). The proportion of each school-age-child category is  $\rho_j$  ( $j=1, 2, 3$ ), note that  $\rho_j$  does not add up to 1 because there are some children aged from 0 to 3 and from 16 to 17 that is not at school. By our previous assumption, the Floating Population at Senior High School is the same as the Floating Population at Junior High School. The Urban and Rural Hukou Floating Population of School-Age-Child Category  $j$  in Province  $i$  are:

$$UInter_{ij} = 19.65\% \times \rho_j \times A_i, \quad (3) \quad , \quad RInter_{ij} = 80.35\% \times \rho_j \times A_i \quad (4)$$

**Table 4: Children of Urban Hukou Interprovincial Floating Population in Each Level of School**

Unit: Person	Kindergarten	Primary School	Junior High School	Senior High School
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Beijing	21139	30998	13606	13606
Shanghai	32039	46981	20621	20621
Tianjin	7267	10655	4677	4677
Guangdong	59784	87665	38479	38479
Zhejiang	50206	73619	32314	32314
Jiangsu	28076	41169	18070	18070

**Table 5: Children of Rural Hukou Interprovincial Floating Population in Each Level of School**

Unit: Person	Kindergarten	Primary School	Junior High School	Senior High School
Beijing	92909	136238	59799	59799
Shanghai	140815	206485	90633	90633
Tianjin	31937	46832	20556	20556
Guangdong	262758	385297	169119	169119
Zhejiang	220658	323565	142023	142023
Jiangsu	123395	180941	79421	79421

Data Source: Summary of Census Data 2010. Given that our estimation is made on year 2009, we assume all the values we get from the basic data are similar to the real values of year 2009.

### **5.3. Social security, income, consumption and saving rate**

We now come to assess the degree in which the Interprovincial Floating Population draw on social security, experience increases in their incomes, in their consumption of goods and services and save money. We want to do so because in the calculation of the fiscal impact, the main effect originates in changes in social security, income and consumption. This allows a first assessment as to whether Interprovincial Floating individuals living in the six provinces make disproportionate use of public welfare services. In our estimation we do not distinguish between different kinds of public welfare services.

We create a binary variable, named  $y_i$ , and denote as  $y_i=1$  individual with any kind of social security (including unemployment insurance, healthcare, industrial injury insurance, maternity insurance, housing fund, e.g.), otherwise as  $y_i=0$ . We also generate the binary variables  $Inter_i$ ,  $Intra_i$  and  $UH_i$  to indicate whether individual  $i$  is an Interprovincial Floating Population, whether the individual belongs to Intraprovincial Floating Population and whether the individual has Urban Hukou. Also, we control for other observable characteristics of the individual in order to study differences in the probability between different demographic groups with similar age, gender and other characteristics.

$$y_i = \alpha + \beta Inter_i + \gamma Intra_i + \delta UH_i + \mathbf{X}_i' \boldsymbol{\theta} + \mathbf{P}_i' \boldsymbol{\varphi} + \mu_i. \quad (5)$$

The vector  $\mathbf{X}_i$  indicates the characteristics of the individual  $i$ ; vector  $\mathbf{P}_i$  indicates the

dummy variable of the province in which the interview took place. The detailed description of all included variables will be provided in Section 4.1 after the regression outcome.

In equation (5), the probability that an individual receives any form of social security is given by  $\text{Prob}(y_i=1)=\text{Prob}(y_i^*>0)$ . We assume that the random component in (5) is normally distributed,  $\mu_i\sim N(0,1)$ , and thus estimate equation (5) by probit. The parameters  $\beta$  and  $\gamma$  represent the influence of being an Interprovincial Floating individual or an intraprovincial floating individual on the probability of claiming social benefit. The coefficient  $\delta$  measures the impact of having Urban Hukou against having Rural Hukou on the probability of being qualified to claim social benefit. We condition on the province dummy  $P_i$  to ensure that  $\partial\text{Prob}(y_i = 1|P_i)/\partial\text{Inter}_i$  ,  $\partial\text{Prob}(y_i = 1|P_i)/\partial\text{Intra}_i$  and  $\partial\text{Prob}(y_i = 1|P_i)/\partial\text{UH}_i$  equals the averaged difference in the probability of claiming social security.

The log of annual personal income of a Person  $i$ , the log of annual consumption and the level of saving rate of a Family  $i$  are denoted as  $\text{Income}_i$ ,  $\text{Consumption}_i$  and  $\text{Saving}_i$  respectively. The dummies  $\text{Inter}_i$ ,  $\text{Intra}_i$  and  $\text{UH}_i$  denote the status of Hukou of the person interviewed in the family.

$$\text{Income}_i = \alpha + \beta'\text{Inter}_i + \gamma'\text{Intra}_i + \delta'\text{UH}_i + \mathbf{Z}_i'\boldsymbol{\lambda} + \mathbf{P}_i'\boldsymbol{\eta} + r_i ; \quad (6)$$

$$\text{Consumption}_i = \alpha + \beta''\text{Inter}_i + \gamma''\text{Intra}_i + \delta'\text{UH}_i + \mathbf{M}_i'\boldsymbol{\kappa} + \mathbf{P}_i'\boldsymbol{\vartheta} + u_i ; \quad (7)$$

$$\text{Saving}_i = \alpha + \beta'''\text{Inter}_i + \gamma'''\text{Intra}_i + \delta'''\text{UH}_i + \mathbf{N}_i'\boldsymbol{\phi} + \mathbf{P}_i'\boldsymbol{\psi} + v_i . \quad (8)$$

The vector  $\mathbf{Z}_i$  indicates the characteristics of individual  $i$ ; vector  $\mathbf{M}_i$  indicates the characteristics of family  $i$ ; vector  $\mathbf{N}_i$  indicates the characteristics of family  $i$ . The coefficients' meanings are similar to the ones we introduce in equation (5). The detailed description of all included variables will be described in Section 4.1 after the regressions' outcome.

#### **5.4. Fiscal contribution and cost**

As we stress at the beginning of this paper, the most important part of our analysis is the imputation of the net fiscal contribution of each individual of Urban Hukou Interprovincial Floating Population (UInter) and each individual in Rural Hukou Interprovincial Floating Population (RInter). We regard each of the six provinces as an integrated public financial

system. The total annual fiscal revenue is the sum of the all sources fiscal income. Similarly, the total annual fiscal expenditure is the sum of all sources of fiscal costs. Our estimation examines each category of fiscal revenue and expenditure. Then we apportion them to each permanent resident in the province. *Surplus* denotes the difference between the government's annual revenue and expenditure. *REV* and *EXP* are the total annual fiscal revenue and expenditure respectively. We have the equation that  $REV = \sum_{i=1}^n rev_i$  &  $EXP = \sum_{j=1}^m exp_j$ , in which  $rev_i$  and  $exp_j$  ( $i=1,2,\dots,m$  and  $j=1,2,\dots,n$ ) represents the income and expenditure of each fiscal category respectively.

$$Surplus = REV - EXP = \sum_{i=1}^n rev_i - \sum_{j=1}^m exp_j. \quad (9)$$

For each fiscal category, we have  $rev_i = \sum_{k=1}^6 con_{ik}$  and  $exp_j = \sum_{k=1}^6 cost_{jk}$ , in which  $con_{ik}$  and  $cost_{jk}$  are the shares of fiscal contribution and cost of the demographic group  $k$  ( $k=1,2,3,4,5,6$ ). The demographic groups are Urban Hukou Interprovincial Floating Population, Rural Hukou Interprovincial Floating Population, Urban Hukou Intraprovincial Floating Population Subsequently, Rural Hukou Intraprovincial Floating Population, Urban Hukou Household Population and Rural Hukou Household Population. For demographic group  $k$ , an individual's fiscal contribution and cost is equal to  $a_k = con_{ik}/N_k$  and  $b_k = cost_{jk}/N_k$  respectively on average. As a result, the personal net fiscal contribution of each demographic group on average is equal to  $Net_k = \sum_{i=1}^n a_k - \sum_{j=1}^m b_k$ .

To clarify the imputation of the net contribution, we define an auxiliary variable named "contribution ratio". There are two versions of such ratio. One is the ratio of the net fiscal contribution to the annual income. The other is the ratio of the net fiscal contribution to the annual average personal consumption:

$$\text{Version 1: } contribution\ ratio_k = \frac{Net_k}{Income_k} \quad ; \quad (10)$$

$$\text{Version 2: } contribution\ ratio_k = \frac{Net_k}{Consumption_k} \quad . \quad (11)$$

## 6. Imputation for Net Fiscal Contribution by Fiscal Categories

We stress that our imputation aims at calculating the per capita net fiscal contribution of the Floating Population for the six developed provinces in year 2009.

### 6.1. Fiscal Income:

(a) “Personal Income Tax” is a direct tax levied on income of a person. Among the total tax revenue collected from local people of one province, the local government take 40% of the revenue, while the central government of China takes 60% of the revenue (NBSC, 2013). The tax mainly contains 2 parts: Labor Income Tax with 7-step progressive tax rate (5-step Progressive Tax for self-employed person) and Asset Income Tax with 20% fixed tax rate (Jintao Hu, 2007).

We use both individual and family level data from the China Family Panel Survey 2010.

We have data at the individual level and at the family level for personal income, personal labor income, family income, number of workers in the family and family size, all of which are reported in the survey. One person or more than one person in the family are interviewed if the family size is greater than one.

We compute three main statistics: labor ratio, labor income tax and asset income tax.

Labor ratio: It equals the number of people in the family with labor income divided by the family size. Then we calculate the average labor ratio of the six demographic groups respectively.

Labor income tax: Personal labor income multiplied by the corresponding level of tax rate. Further, we figure out the average monthly labor tax paid by each individual of the six demographic groups respectively.

Asset income tax: Personal asset tax equals family asset income, divided by family size and multiplied by the fixed tax rate 20% (Jintao Hu, 2007). We then figure out the average monthly asset income tax amount of each individual of the six demographic groups respectively.

Average annual personal income tax contribution= (Labor Income Tax × Labor Ratio + Asset Income Tax)×40%×12.

(b) “Normal Consumption Related Taxes and Fees” are the taxes and fees related with the purchasing goods and services.

Value added tax is charged when people buy goods at tax rate 17% for most of the goods and 13% for agriculture goods (Jiabao Wen, 2008). 25% of value added tax goes to the local

government and 75% of it goes to the central government (Jintao Hu, 2007).

“Business Tax” is charged when people purchase services such as construction work, entertainment, with tax rates varying across different services from 0% to 20% (Jiabao Wen, 2009).

The “Urban Maintenance and Development Tax” is charged proportionally to the sum of “Value Added Tax and Business Tax”. The normal tax rate is 7% in cities, 5% in small towns and 0% in rural areas (State Council, 1985).

“Educational Subsidies” is charged proportionally to the sum of value added tax and business tax. The tax rate ranges from 3% to 5% (State Council, 2005).

“Stamp Tax” is charged when a producer signs a transportation, production or storage contract. However, since its tax rate is very low (less than 0.05 percent, Ministry of Finance & State Administration of Taxation, 1988) and can hardly provide significant influence to our final outcome, we choose to ignore it.

The imputation is conducted as the following:

Value added tax: To impute the value added tax revenue, several important issues should be taken into consideration. First of all, not all the value added tax is collected from permanent residents in the province. There are visitors, temporary residents (person who stay in the region for less than 6 months), institutions and local governments as consumers also in the provinces. What is more, their influence is quite large. Beijing and Shanghai are very important cities for business and travel. Beijing is also the seat of the Central Government of China. In 2012, Beijing’s 25% of total retail sales of consumer goods were made to visitors (China National Radio 2012). The share is high because Beijing is only a municipality with relative small population of permanent residents compared with a real “province”. Beijing is an important tourist city attracting 230,000,000 visitors in 2012 (China National Radio, 2012). We can expect that Shanghai and Tianjin, the other two municipalities, in our sample, to be similarly influenced by the visitors as Beijing. On the other hand, Guangdong, Zhejiang and Jiangsu are provinces with large population of permanent residents. Total population of permanent residents of Beijing, Shanghai and Tianjin was 55.57 million in 2010, while



Zhejiang, which had the smallest population among the three provinces, had 54.43 million people in 2010, approximately 50% of the population in Guangdong (Xiangjiang Zou, 2011). Tourism in Guangdong contributed 26.41 million Yuan to the local GDP, which was only 13% of the sum of total final consumption and the tourism industry income that year. As a result, we assume that the non-permanent residents contributed 25% of the total consumption and 25% of the consumption-related tax of the six provinces we pick to ensure not to overestimate the tax-contribution made by the local residents.

By our calculation, 60% of final consumption is made by residents living in urban area. Thus we multiplied the 75% of total value added tax income with 60% to get the Urban Residents Value-Added Tax Contribution (URVAT).

Then, we calculate the average annual expenditure on goods of each family divided by its family size (number of family members) in each demographic group to get the average personal annual expenditure.

**Table 6: Goods Consumption Per Capita and Index of Consumption Related Tax**

	UH	RH	UInra	RInra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Goods Consumption (¥)	8217.74	3759.63	11937.93	7477.73	11223.29	8846.39
Index	0.9289	0.4250	1.3495	0.8453	1.2687	1.0000

Data Source: China Family Panel Survey 2010, the Summary of Census of China 2010, Fiscal data of 2009.

We then set the average personal annual goods consumption amount of Rural Hukou Interprovincial Floating Population (RInter) equal to Index “1”. Indexes of other demographic groups equals the ratio of their average personal annual goods consumption to the average personal annual goods consumption of each Rural Hukou Floating Population.

Then personal value-added tax contribution of the two groups of Floating Population equals:

$$VAT\ Contribution_{RInter} = \frac{URVAT}{\sum_{i=1}^5 Population_i \times Index_i} \times 25\%; \quad (12)$$

$$VAT\ Contribution_{UInter} = VAT\ Contribution_{RInter} \times Index_{UInter}; \quad (13)$$

where  $i=1,2,3,4,5$  represents UH, UIntra, RIntra, UInter and RInter respectively. Rural Hukou Household Population they are not urban residents.

Business Tax: We calculate Business Tax by multiplying each kind of consumption of

service with the corresponding tax rate:

$$Family\ Annual\ Business\ Tax = \sum_{i=1}^n Service_i \times Tax\ Rate_i . \quad (14)$$

In the above equation,  $i$  indexes different kinds of services reported by the CFPS data. To know the personal annual business tax contribution, we just need to divide the family's annual business tax payment by the family size.

Educational Subsidies and Urban Maintenance and Development Tax:

Since Educational Subsidies and Urban Maintenance and Development Tax are both charged in proportion to the sum of Value Added Tax and Business Tax, we calculate them together. We set the total tax rate at 10%, since the tax rate ranges from 8% to 12%.

$$Education\ Subsidies\ \&\ Urban\ Maintenance\ and\ Development\ Tax = (VAT + Business\ Tax) \times 10\% \quad (15)$$

(c) "Vehicle Vessel Tax" is paid by the owners of private vehicles or vessels. From the data of CFPS, we know the number of private cars a family owns. We then calculate the average number of cars a person has in each demographic group by the ratio of number of cars a family has to the family size.

As we do in calculating Value Added Tax contribution, we set the average number of cars one of Rural Hukou Floating Population has to be Index of "1".

**Table 7: Car Number Per Capita and Index of Vehicle Vessel Tax**

	UH	RH	UInra	RInra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Car Number	0.044	0.025	0.087	0.031	0.041	0.089
Index	0.497	0.277	0.980	0.344	0.462	1.000

Data Source: China Family Panel Survey 2010, the Summary of Census of China 2010, Fiscal data of 2009.

We then calculated the tax contribution:

$$Vehicle\ Vessel\ Tax_{RInter} = Total\ Vehicle\ Vessel\ Tax \frac{Revenue}{\sum_{i=1}^6 Index_i} \times Population_i \quad (16)$$

$$Vehicle\ Vessel\ Tax_{UInter} = Vehicle\ Vessel\ Tax_{RInter} \times Index_{UInter} \quad (17)$$

where  $i=1,2,3,4,5,6$  represents UH, RH, UIntra, RIntra, UInter and RInter.

(d) "Tax on Contracts" is paid by the people who buy real estate in the respective year. It equals to 3% of the total value of the real estate purchased. Data from the China Family Panel Survey 2010 show the total value of the real estate purchased by the family during last year.

We divide the value of the real estate purchased last year by family size and average the quotient to get the personal expenditure on real estate of each demographic group  $i$ .

$$\text{Tax on Contracts}_i = \text{Personal Expenditure on Real Estate}_i \times 3\% \quad (18)$$

where  $i=1,2,3,4,5,6$  represents UH, RH, UIntra, RIntra, UInter and RInter.

(e) “Land Appreciation Tax” is the tax paid by people who purchase real estate. The tax is proportional to the added value of the real estate. Here we assume that the added value of the real estate sales is proportional to the total value of the estate. Similarly, we divided the total consumption of each family by the corresponding family size to figure out each individual’s expenditure on the purchasing of each demographic group.

We set average expenditure per capita of Rural Hukou Floating Population as Index of “1”.

**Table 8: Real Estate Value Per Capita and Index of Land Appreciation Tax**

	UH	RH	UIntra	RIntra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Real Estate Value (¥)	5400.58	3043.64	35706.09	9899.62	11203.48	10301.77
Index	0.5242	0.2954	3.4660	0.9610	1.0875	1.0000

Data Source: China Family Panel Survey 2010, the Summary of Census of China 2010, Fiscal data of 2009.

We then calculated the tax contribution as following equation:

$$\text{Land Appreciation Tax}_{RInter} =$$

$$\text{Total Land Appreciation Tax Revenue} / \sum_{i=1}^6 \text{Index}_i \times \text{Population}_i \quad (19)$$

$$\text{Land Appreciation Tax}_{UInter} = \text{Land Appreciation Tax}_{RInter} \times \text{Index}_{UInter} \quad (20)$$

where  $i=1,2,3,4,5,6$  denote UH, RH, UIntra, RIntra, UInter and RInter, respectively.

(f) “Company Income Tax” is paid by all corporations in the province, in proportion to the corporation’s net profit (net of any other costs such as VAT tax). 40% percent of the total tax revenue is collected by the local government (Jintao Hu, 2007). When an additional individual comes into the province, even he/she does not provide any additional capital to the area, he/she contributes to the corporation’s net profit, because he/she consumes. From the public finances data of the six provinces (NBSC, 2010), we know the gross domestic production (GDP). In the output version of GDP, we know the local final consumption made by the local residence. Because GDP is the total production of all local companies, contributing to final consumption as part of the GDP can be regarded as contributing to the

revenue of company income tax. As we calculated in the previous calculation, the final consumption of the urban permanent resident is 60% of the total final consumption and it is 28% to the six provinces' total GDP. The consumption-related company income tax revenue (CCIT) is equal to the total company income tax revenue multiplied by 28%.

CFPS reports the annual family total consumption. We divide the family consumption by the corresponding family size to figure out the personal consumption amount. We set the personal average consumption amount of a Rural Hukou Floating Population as Index of "1".

**Table 9: Expense on Consumption Per Capita and Index of Company Income Tax**

	UH	RH	UInra	RInra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Consumption (¥)	13638.21	7092.405	22291.09	13506.65	23279.33	16193.71
Index	0.8422	0.4380	1.3765	0.8341	1.4376	1.0000

Data Source: China Family Panel Survey 2010, the Sixth Census of China 2010, Fiscal data of 2009.

We have the following equation:

$$\text{Company Income Tax Contribution}_{RInter} = \text{Total Company Income Tax Revenue} \times 40\% / \sum_{i=1}^6 \text{Index}_i \times \text{Population}_i \quad (21)$$

$$\text{Company Income Tax Contribution}_{UInter} = \text{Company Income Tax Contribution}_{RInter} \times \text{Index}_{UInter} \quad (22)$$

where  $i=1,2,3,4,5,6$  represents UH, RH, UIntra, RIntra, UInter and RInter.

(g) "Income from Fines and Penalties" is paid by those who are punished for breaking rules. In our data, there is no evidence showing difference of the rates of law violation among different groups. So we average the apportioning of the income from fines to each individual.

(h) "Other Non-Tax Revenue", is apportioned equally to each individual in the provinces.

(i) "Uncorrelated Fiscal Incomes" are the fiscal incomes such that one more individual of Interprovincial Floating Population living in the province is regarded as having zero marginal effect on the fiscal incomes. They are Resource Tax, House Property Tax, Urban Land Using Tax, Tax on the Use of Arable Land, Special Revenue (except Education Subsidies), Administrative and Institutional Charges. Except "Special Revenue", the rests are mostly paid by companies proportional to the natural resource used, the real estate kept, the urban and arable land occupied and public service received. In this case, the marginal fiscal effect

of one individual of Floating Population on the fiscal income is very small. And if we averagely apportion the fiscal income to everyone as the marginal income, we probably overestimate the fiscal contribution. Special revenue is not included because it is charged only on some specific sectors, like the mining sector, nuclear sector, e.g., which have little thing to do with Interprovincial Floating Population.

## **6.2. Fiscal Cost:**

(a) "Pure Public Goods" are the fiscal expenditures such that one more individual of Interprovincial Floating Population living in the province is regarded as having zero effect on it. In our analysis, they are the fiscal cost of Diplomacy, National Defense, Science and Technology Development, Expenditure on Culture, Physical Education and Media Issues, Housing for Social Security Purpose, Social Security and Employment (except transfers to social insurance funds), Agriculture Forestry and Water Conservancy, Mining Power and Information Affairs, Cereals Oil and Reserve, Finance & Banking Management, 43% of Environmental Protection, Earthquake Rebuilding and Interest Payment for Domestic and Foreign Debts.

Among these categories, there are several that we wish to describe in detail.

Expenditure on Social Security and Employment (except transfers to social insurance funds) is partly spent on the retirement pension of local government's employees. However, it is almost impossible for a person to work in a department of local government until he/she retires but without his/her non-local Hukou changed into local Hukou. Thus this part of cost can hardly benefit an individual of Interprovincial Floating Population. Part of the expenditure is invested in providing subsidies to enterprise reform, which has nothing to do with individuals because we regard all Interprovincial Floating Population as not owning firms. Part of the expenditure is used for subsidies to employment, pensions and basic living standard subsidies. However, in the data of CFPS, no Interprovincial Floating individuals receive subsidies to employment. Pension and basic living standard subsidies can only be claimed from the government of the location where the individuals' Hukous are registered (State Council of PRC, 2005).

Cost of Agriculture, Forestry and Water Conservancy is mainly spent on agriculture and irrigation, which has nothing to do with the Interprovincial Floating Population who are working in urban area at non-agricultural sector.

Expenditure on Culture, Physical Education and Media is invested in 5 main categories: culture, protection of monuments, sports, media and publication. Investment in culture is used to build facilities like libraries, museums, e.g. and holding events like theatrical performances. The investment on protection of monuments is used to protect the historical sites and attractions. The investment on sports is used to build facilities like court and stadium, that hold sports competitions. Investing on media and publication is to improve the media and publication, which are probably non-rival. Given the existing population in the provinces we estimated, the marginal fiscal effect of one more individual of Floating Population on these expenditures is almost zero.

43% of the National Total Environmental Protection Cost is regarded as “pure public goods” (Finance Year Book of China, 2010) because this part is used to protect the natural ecology, forest, to return grain plots and grazing land to forest and grassland, to improve the technique of energy conservation and to promote the technique of using regenerative energy. We do not think the incoming Interprovincial Floating Population affects these actions.

Investment on Earthquake Rebuilding is used to help the cities in Sichuan Province, which was affected by the great earthquake in 2008. It has nothing to do with Floating Population.

(b) “Congestible Public Goods” are the fiscal expenditures such that one more individual of Interprovincial Floating Population living in the province has positive fiscal effect on it. Because of the existence of fixed cost, the marginal effect is smaller than the average cost. In analysis, we use the average cost as a proxy of the marginal effect. They include the following fiscal categories: 57% of Environmental Protection Cost (Ministry of Finance of PRC, 2010), Transportation Cost, General Public Service Cost, Social Safety and Order Protection Cost and Urban Rural Service Cost.

There are two ways we can go about this. One is the conservative way that may severely overestimate the fiscal cost of each person of Interprovincial Floating Population. The other

is relatively less likely to severely overestimate of their fiscal cost, but may increase the probability of underestimating their fiscal cost. We denote the outcome of the former way as Scenario 1, the outcome of the latter way as Scenario 2.

In Scenario 1, since we have no information about how the expenditures of these public goods are distributed, we assume all costs of congestible public goods are equally distributed among all the local permanent residents.

In Scenario 2, we take more factors into consideration. Not all of the 57% of Environmental Protection Cost, Transportation Cost, Social Safety and Order Protection Cost are consumed by permanent residents. Besides the permanent residents, there are a large number of non-permanent residents who also consume these “Congestible Public Goods”. Remember that in previous analysis, we assume they make 25% of consumption of local goods when we calculate their contribution to consumption related taxes. In this scenario, we assume 10% of the three “Congestible Public Goods” mentioned are spent on them. Thus the permanent residents totally consume 90% of the three “Congestible Public Goods”.

Expenditure on General Public Services is a sum of 28 certain categories of administrative cost (Ministry of Finance of PRC, 2010). Among them, 14 categories, which are the expenditures on Local Political Consultative Conference, Local People’s Congress, Government Office and Departments, Development Plan and Management, Public Finance Management, Local Customs Issues, Commission for Discipline Inspection, Marine Management, Mapping Engineering, Earth Quake Report and Precaution, Meteorological Report and Precaution, Welfare Lottery Management, Daily Operations of Communist Party of China, Daily operations of Other Demographic Parties and Federations of Industry, have nothing to do with the scale of the incoming Interprovincial Floating Population (Ministry of Finance of PRC, 2010). Since we do not know how much is spent on each category, we make a very strong assumption that the fiscal expenditure of each of the 28 category is the same. We apportion 50% (14/28) of the fiscal expenditure on general public service to each permanent resident.

(c) “Education Cost” is apportioned to the students studying at public school,

public-private mixed school and private school respectively. In Section 1.2.2 we have calculated the number of students in each demographic group. The next step is to calculate the average education expenditure on each individual of Interprovincial Floating Population.

The Ministry of Education of the People’s Republic of China publishes data for Financial Education Funds (财政性教育经费) 2009. From the data, we can find out the total financial education funds of each province and the average financial education funds on each student of each education level in each province.

**Table 10: Financial Education Funds of Year 2009**

	Total Education Funds (Million ¥)	Average Education Funds Per Student (¥)		
		Primary School	Junior High School	Senior High School
Beijing	43103	11662.02	15581.06	16312.03
Shanghai	37507	14792.68	18224.25	16853.72
Tianjin	17983	9131.43	11083.16	10222.49
Guangdong	90357	2896.53	3418.71	4834.38
Zhejiang	54391	5611.99	6886.53	5674.83
Jiangsu	71005	5820.20	5903.74	4391.55

Data source: Table of State Financial Education Funds Expenditure 2009

However, only part of the Financial Education Funds Expenditure is the “Education Cost” paid by local governments of the six provinces. The remaining amount is paid by the Central Government and other public or private institutions (Ministry of Education of PRC, 2012). In our analysis, we denote the ratio of “Education Cost” to the State Financial Education Funds Expenditure as “Education Cost Ratio” (ECR). Data on Public Finance published by the National Bureau of Statistics of China show that, in 2009, total fiscal expenditure on education of China is 1043.754 billion Yuan (NBSC, 2010). This includes what the central government pays, 56.62 billion Yuan, and what local governments pay, 986.992 billion Yuan totally (NBSC, 2010). We apply this ratio to impute the “Education Cost Ratio” as  $986.992/1043.754= 94.6\%$ .

Research shows that only 17.65% children (aged from 0 to 17) of Interprovincial Floating Population study at public-owned education institutions, while 71.48% and 6.67% of them study in public-private-mixed and private education institutions, respectively, which charge higher tuition (Yi Zhang, Xiaoguang Zhou, 2012). While in any of the six provinces, more



than 70% of students are in public schools and students of Interprovincial Floating Population always account for no more than 50% of total students (Yi Zhang, Xiaoguang Zhou, 2012). By this proportion, we can conjecture that, in each province, students of Interprovincial Floating Population are less likely than other students to study in a public school. Although, it is possible that students at public schools, public-private mixed schools and private schools are all subsidized respectively by the local public finance system, it is almost certain that students at public-private mixed and private school are less subsidized than the students in public schools. Since we have no specific data of the differences in fiscal subsidies on different kinds of schools in detail, we assume conservatively that, on average, the “Education Cost” of a student of Interprovincial Floating Population is 80% of average expenditure per student.

Denote the Average Education Funds Per Student as  $AEF_{ij}$ , at Province  $i$  ( $i=1,2,3,4,5,6$ ), for students studying at school of Education Level  $j$  ( $j=1,2,3$ ). To calculate the “Education Cost” of each student of Interprovincial Floating Population, denoted as  $AEC_{ij}$ , apply the following equation:

$$AEC_{ij} = AEF_{ij} \times ECR \times 80\% \quad (23)$$

**Table 11: Average Cost of Education Per Student of Floating Population**

	Primary School (¥)	Junior High School(¥)	Senior High School(¥)
<b>Beijing</b>	8825.82	11791.75	12344.94
<b>Shanghai</b>	11195.10	13792.11	12754.90
<b>Tianjin</b>	6910.67	8387.74	7736.38
<b>Guangdong</b>	2192.09	2587.28	3658.66
<b>Zhejiang</b>	4247.15	5211.73	4294.71
<b>Jiangsu</b>	4404.73	4467.95	3323.53

Date Source: Table of State Financial Education Funds Expenditure 2009

The table shows the average fiscal expenditure on each student of Interprovincial Floating Population (except pre-school student). Note that we do not distinguish between the students with Urban Hukou and Rural Hukou, which may probably overestimate the fiscal cost of students with Rural Hukou.

The Ministry of Education of the PRC does not report the cost of each kindergarten student. However, research shows that proportion of pre-school children of Interprovincial Floating

Population in public-owned kindergartens is very small (Yueping Song, Long Li, 2013).

We assume the average annual fiscal expenditure on each pre-school student studying in a public-owned kindergarten to be 1000 Yuan per year in 2009, which is the per-student investment at public-kindergarten in Pudong District, Shanghai, at year 2010 (Yingquan Song, 2014). It is probably an overestimation because Pudong is one of the most developed districts in Shanghai, the most developed city in China, while the average State Financial Education Funds Expenditure on each child in public-owned kindergarten all over China is only 360 Yuan (Yingquan Song, 2014).

Also, from existing research we know the proportion of children aged from 3 to 6 of Interprovincial Floating Population that are able to study in Kindergarten and the proportion of them that are able to study in public kindergarten.

**Table 12: Pre-School Children of Floating Population That Are Able to Study at Kindergarten**

	In Kindergarten	In Public Kindergarten
<b>Beijing</b>	59%	21.0%
<b>Shanghai</b>	56%	27.0%
<b>Tianjin</b>	55%	15.4%
<b>Guangdong</b>	52%	10.4%
<b>Zhejiang</b>	71%	19.2%
<b>Jiangsu</b>	58%	30.2%

Data source: Regional Difference of the Floating Children’s Pre-Schools Education in China, Yueping Song, Long Li, 2013. The data reports that proportion of children of Floating Population aged from 3 to 6 that are able to study at Kindergarten and Public Kindergarten.

Then by multiplying by 1000 the proportion of children of Floating Population (both Interprovincial and Intraprovincial) in Public Kindergarten we calculate the average “Cost of Education” on each child of Floating Population in Public Kindergarten.

(d) “Medical and Health Care Costs” are spending on the publicly owned medical system. We can only make a rough assessment here, because the database CFPS only tells us whether an individual was hospitalized in the previous year and whether the individual visited a doctor in the past 6 months. We define a dummy variable named “Medical Care”. A person who visited doctor in the past 6 months or hospitalized in the past 6 months has his/her “Medical Care” the equal to 1. The rest have their dummy equal to 0. We calculate the mean of the dummy in each demographic group. After that we set the mean of the dummy of Rural

Hukou Interprovincial Floating Population to be the index equal to 1.

**Table 13: Expenditure on Medical and Health Care Per Capita and Index of the Expenditure**

	UH	RH	UInra	RInra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Mean	0.3371	0.3425	0.3846	0.3107	0.2698	0.2038
Index	1.6541	1.6805	1.8872	1.5244	1.3237	1.0000

Data Source: China Family Panel Survey 2010, the Sixth Census of China 2010, Fiscal data of 2009

*Medical and Health Care Consumption*<sub>RInter</sub> =

$$Total\ Medical\ and\ Health\ Care\ \frac{Cost}{\sum_{i=1}^6 Index_i} \times Population_i ; \quad (24)$$

*Medical and Health Care Consumption*<sub>UInter</sub> =

$$Medical\ and\ Health\ Care\ Consumption_{RInter} \times Index_{UInter}; \quad (25)$$

where i=1,2,3,4,5,6 represents UH, RH, UIntra, RIntra, UInter and RInter.

(e) “Social Security Compensation Costs” are social security payments. Using the data from CFPS, we generate the dummy variable “Social Security” indicating individuals with any kind of social security paid by local governments. Interprovincial Floating Population with the “New Country Cooperation Medical Treatment” as his/her only insurance is not classified as the ones with social security, because the once they get ill, the healthcare cost is paid by the “New Country Cooperation Medical Treatment” in the location where their Hukous are registered, which are outside the six developed provinces (Jintao Hu, 2006). We then define the dummy of the ones with social security as 1 and the rest as 0. We calculate the mean of the dummy variable in each demographic group. After that we set the mean of the dummy of Rural Hukou Interprovincial Floating Population to be the index equal to 1.

**Table 14: Expenditure on Social Security Compensation Per Capita and Index of the Expenditure**

	UH	RH	UInra	RInra	UInter	RInter
Population	123432261	80763824	13620373	15427351	10672224	49043274
Mean	0.7869	0.7765	0.7205	0.6311	0.5873	0.2611
Index	3.0135	2.9736	2.7592	2.4166	2.2490	1.0000

Data Source: CFPS 2010, the Sixth Census of China 2010, Fiscal data of 2009.

*Social Security Consumption*<sub>RInter</sub> =

$$Total\ Social\ Security\ Compensation\ \frac{Cost}{\sum_{i=1}^6 Index_i} \times Population_i ; \quad (26)$$

*Social Security Consumption*<sub>UInter</sub> =

$$\text{Social Security Consumption}_{RInter} \times \text{Index}_{UInter} ; \quad (27)$$

where  $i=1,2,3,4,5,6$  represents UH, RH, UIntra, RIntra, UInter and RInter.

(f) “Other Expenditures” are equally apportioned to each permanent resident in the provinces.

### 6.3 Outcome of Imputations of Net Fiscal Contribution of Floating Population

Our imputation calculates the per capita net fiscal contribution of floating population at the six developed provinces in year 2009. The following table shows the outcome of the imputations and the net fiscal contributions of Interprovincial Floating Population. This is the most crucial result of the whole research.

**Table 15: Net Per Capita Fiscal Contribution of Interprovincial Floating Population**

Unit: Yuan	Scenario 1		Scenario 2	
	Urban Hukou Interprovincial Floating Population	Rural Hukou Interprovincial Floating Population	Urban Hukou Interprovincial Floating Population	Rural Hukou Interprovincial Floating Population
<b>Fiscal Contribution Per Capita</b>				
Personal Income Tax	707.58	353.03	707.58	353.03
Value-Added Tax	579.13	456.48	579.13	456.48
Business Tax	355.51	185.82	355.51	185.82
Urban Maintenance and Development Tax & Education	273.69	205.75	273.69	205.75
Tax on Vehicles and Vessels Use	20.84	45.07	20.84	45.07
Tax on Contracts	336.10	309.05	336.10	309.05
Land Appreciation Tax	198.75	182.75	198.75	182.75
Company Income Tax	462.40	321.66	462.40	321.66
Fines and Penalties	99.91	99.91	99.91	99.91
Other Non-tax Revenue	41.97	41.97	41.97	41.97
Total Fiscal Contribution	<u>3075.89</u>	<u>2201.50</u>	<u>3075.89</u>	<u>2201.50</u>
<b>Fiscal Cost Per Capita</b>				
Environmental Protection Cost	78.84	78.84	70.95	70.95
Transportation Cost	342.95	342.95	308.66	308.66
General Public Service	723.96	723.96	361.98	361.98
Public Safety Protection Cost	455.01	455.01	409.51	409.51
Urban Rural Service Cost	136.69	136.69	136.69	136.69
Education Cost	310.00	289.08	310.00	289.08
Medical and Health Service Cost	287.34	217.08	287.34	217.08
Cost of Social Security and Unemployment	105.54	46.93	105.54	46.93
Other Expenditure	360.82	360.82	360.82	360.82
Total Fiscal Cost	<u>2801.15</u>	<u>2651.35</u>	<u>2351.49</u>	<u>2201.69</u>
Net Fiscal Contribution	<b>274.74</b>	<b>-449.86</b>	<b>724.40</b>	<b>-0.20</b>

The table reports the imputation of fiscal contribution and fiscal cost per capita of Interprovincial Floating

Population in year 2009. There are two scenarios in the table. The only differences of the two scenarios are the imputation of Environmental Protection Cost, Transportation Cost and General Public Service. The details of such different imputations have been talked about in the part of “Congestible Public Goods”. The Net Fiscal Contribution is the difference of Total Fiscal Contribution and Total Fiscal Cost per capita.

The table shows that in both Scenario 1 and Scenario 2, the net fiscal contributions per capita of Urban Hukou Interprovincial Floating Population are positive. As we mentioned before, our approach probably underestimates the per capita marginal net fiscal contribution. Thus, we can expect that the per capita net fiscal contribution of Urban Hukou Interprovincial Floating Population is positive and the real value of it is higher than the result we have here.

Individuals in the Rural Hukou Floating Population have negative per capita net fiscal contribution in both Scenario 1 and Scenario 2. In Scenario 1, the value is -449.86 Yuan. In Scenario 2, the value is -0.20 Yuan. Clearly it is difficult to determine whether the per capita marginal net fiscal contribution is positive or negative, because we use the average fiscal cost as the proxy of marginal fiscal cost, and we probably underestimate the average net fiscal contribution. Thus, it is hard to say whether the Rural Hukou Floating Population contributes to local government’s net fiscal income. However, given that in Scenario 2, the net fiscal contribution is very close to 0, although it is still negative, it is highly likely that the real marginal net fiscal contribution is positive.

As we said in the Section 5.4, we can apply the two equations to calculate the net fiscal contribution ratio of Demographic Group  $k$  ( $k=1, 2$ ):

$$\text{Version 1: } \textit{contribution ratio}_k = \frac{Net_k}{Income_k} \quad (10)$$

$$\text{Version 2: } \textit{contribution ratio}_k = \frac{Net_k}{Consumption_k} \quad (11)$$

Using data from the China Family Panel Survey (CFPS), we have that the average annual income of a person of Urban Hukou Interprovincial Floating Population to be 30179.14 Yuan. The average annual income of a person of Rural Hukou Interprovincial Floating Population is 22746.09 Yuan. The total expenditure of a person of Urban Hukou Interprovincial Floating Population is 23279.33 Yuan. The total expenditure of a person of Rural Hukou Interprovincial Floating Population is 16193.71 Yuan.

Scenario 1:

So in Version 1,  $contribution\ ratio_{UInter} = \frac{274.74}{30179.14} \approx 0.91\%$

$$contribution\ ratio_{RInter} = \frac{-449.86}{22746.09} \approx -1.98\%$$

So in Version 2,  $contribution\ ratio_{UInter} = \frac{274.74}{23279.33} \approx 1.18\%$

$$contribution\ ratio_{RInter} = \frac{-449.86}{16193.71} \approx -2.78\%$$

Scenario 2:

So in Version 1,  $contribution\ ratio_{UInter} = \frac{724.40}{30179.14} \approx 2.40\%$

$$contribution\ ratio_{RInter} = \frac{-0.20}{22746.09} \approx 0$$

So in Version 2,  $contribution\ ratio_{UInter} = \frac{724.40}{23279.33} \approx 3.11\%$

$$contribution\ ratio_{RInter} = \frac{-0.20}{16193.71} \approx 0$$

The differences in income, expenditure between the Urban Hukou Interprovincial Floating Population and Rural Hukou Interprovincial Floating Population are the main reasons for the difference in net marginal fiscal contribution. The difference in per capita Personal Income Tax, Value Added Tax and Business Tax accounts for 73.98% of the difference in the per capita fiscal contribution. Although the average per capita fiscal expenditure on Rural Hukou Interprovincial Floating Population is less than Urban Hukou Interprovincial Floating Population, their difference is relatively small, only 149.14 Yuan.

## 7. Correlation of Economic Status and Hukou Type

We discuss here the results from the estimations of equations (5), (6), (7), and (8). As we mentioned in Section 1.2.3, these regressions show whether Non-local Hukou and Rural Hukou influence a person's probability of getting social benefit and their income, consumption, saving rate.

Equations (5) and (6) are individual level estimations. Equations (7) and (8) are family level estimation. Income and Consumption are in "log" form. The  $y_i$  of Equation (5) is a dummy variable "Social Security": it equals 1, if the person has social security paid by the government of his/her resident province. The regression is performed with all the adult people (age>16) in the sample. We perform separate regressions with the adults with income

and the adults without income. The former one has 5931 observations, while the latter one has 1391 observations. The dependent variable of Equation (6) is Ln (Income), the log form of the person's annual income. The regression is performed with all adults with income.

**Table 16: Correlation between Probability of Claiming Social Security, Annual Income and Hukou**

Dependent Variable	Social Security		Ln (Income)
	People with Income	People without Income	People with Income
Interprovincial Immigrant	-0.375*** (0.0802)	-0.0539 (0.104)	0.321* (0.177)
Intraprovincial Immigrant	-0.0822*** (0.0311)	-0.0966 (0.0640)	0.103 (0.0907)
Rural Hukou	0.0346** (0.0140)	0.0186 (0.0317)	-0.319*** (0.0439)
Rural × Interprovincial	-0.0720 (0.0452)	-0.279** (0.116)	0.0402 (0.118)
Rural × Intraprovincial	-0.0738 (0.0497)	-0.0666 (0.106)	0.300** (0.135)
Urban Location	-0.0443*** (0.0108)	-0.0749*** (0.0259)	0.222*** (0.0357)
Age	-0.00361* (0.00210)	0.00235 (0.00414)	0.0464*** (0.00748)
Age Square	6.70e-05*** (2.10e-05)	1.38e-05 (3.98e-05)	-0.000536*** (7.67e-05)
Party Member	0.0197 (0.0195)	0.0811** (0.0344)	0.110** (0.0554)
Father is a Party Member	0.0226 (0.0150)	0.0279 (0.0393)	-0.0130 (0.0404)
Mother is a Party Member	-0.0173 (0.0418)	-0.0137 (0.107)	0.238*** (0.0713)
Minority Ethnic	0.0244 (0.0332)	-0.0187 (0.0869)	0.161 (0.110)
Siblings	0.00722** (0.00288)	0.0173*** (0.00627)	-0.0160* (0.00927)
Education Primary	-0.000344 (0.0158)	0.0723** (0.0303)	0.247*** (0.0527)
Interprovincial × Primary	0.0249 (0.0443)	-0.0531 (0.116)	-0.0552 (0.205)
Education Junior High	0.0629*** (0.0137)	0.0193 (0.0309)	0.305*** (0.0536)
Interprovincial × Junior	0.000164	-0.0749	-0.0699

	(0.0433)	(0.112)	(0.166)
Education Senior High	0.0635***	0.0377	0.426***
	(0.0148)	(0.0357)	(0.0597)
Interprovincial × Senior	0.0660**	-0.264	0.0328
	(0.0329)	(0.168)	(0.170)
Education Professional	0.0718***	0.0138	0.707***
	(0.0176)	(0.0558)	(0.0780)
Interprovincial×Professoial	0.0808**	-0.411*	-0.0344
	(0.0389)	(0.233)	(0.229)
Education Bachelor	0.107***	0.0556	0.848***
	(0.0150)	(0.0609)	(0.111)
Interprovincial × Bachelor	0.0612	-0.303	0.0178
	(0.0493)	(0.319)	(0.223)
Education Above Bachelor	0.0680		1.574***
	(0.0562)		(0.129)
Married	0.0381**	-0.0160	0.154***
	(0.0151)	(0.0301)	(0.0458)
Male	-0.0111	-0.0807***	0.375***
	(0.00996)	(0.0270)	(0.0299)
Self-Employed	0.0138	0.143***	1.013***
	(0.0165)	(0.0323)	(0.0545)
Agricultural Sector	0.0758***	0.0478	0.00428
	(0.0128)	(0.0412)	(0.0592)
Non-Agricultural Sector	0.0952***	0.0591	0.753***
	(0.0121)	(0.0474)	(0.0417)
Manager	0.0392**	0.0935	0.473***
	(0.0178)	(0.0975)	(0.0398)
Ln (Income)	0.00628		
	(0.00391)		
Province Beijing	0.103***	0.187***	-0.241*
	(0.0168)	(0.0136)	(0.131)
Province Tianjin	-0.0418	0.0770	0.231**
	(0.0331)	(0.0470)	(0.103)
Province Shanghai	0.105***	0.215***	0.224***
	(0.0168)	(0.0359)	(0.0666)
Province Zhejiang	0.0821***	0.163***	0.359***
	(0.0156)	(0.0174)	(0.0761)
Province Guangdong	0.0743***	0.206***	-0.174***
	(0.0161)	(0.0316)	(0.0652)
Observations	5,927	1,391	5,931

The table reports the results of estimating equation (4) and (5). The column labeled “People with Income” gives result based on data from the people who reported their income to be greater than zero. Robust standard errors



are in parentheses. \*\*\*, \*\* and \* denote significant level significance at the 1%, 5% and 10% levels respectively.

There are 28 independent dummy variables in the regressions. “Interprovincial Immigrant” and “Intraprovincial Immigrant” indicate that the person belongs to Interprovincial Floating Population and Intraprovincial Floating Population, respectively, if they equal to 1. People of Household Population have these two variables equal to 0. “Rural Hukou” indicates the person has a Rural Hukou when it equals 1. “Urban Location” indicates that the interview took place in urban area, when it equals 1. “Party Member”, “Father is a Party Member” and “Mother is a Party Member” indicate the person himself/herself, his/her father, his/her mother is a member of the Chinese Communist Party, respectively, when they equal to 1 respectively. “Ethnic Minority” indicates the person does not belong to Ethnic Han, when it equals 1. “Married” indicates the person is married, if the dummy equals 1. “Male” indicates the person is male, if it equals 1. “Self-Employed” indicates the person is self-employed, if it equals 1. “Agricultural Sector” indicates the person works in an agricultural sector, if it equals 1. “Non-Agricultural Sector” indicates the person works in non-agricultural sector, if it equals 1. “Manager” indicates the person has a management position, if it equals 1. The Education Level Dummies are “Education Primary”, “Education Junior High”, “Education Senior High”, “Education Professional”, “Education Bachelor”, “Education Above Bachelor” indicate the person’s highest education level is primary school, junior high school, senior high school, professional school, bachelor or higher than bachelor, respectively, when each respective variable is equal to 1. The Province dummies are “Province Beijing”, “Province Tianjin”, “Province Shanghai”, “Province Zhejiang” and “Province Guangdong” indicating the person now live in Beijing, Tianjin, Shanghai, Zhejiang or Guangdong, respectively.

The interaction terms are those with “ $\times$ ” in the variables. “Rural  $\times$  Interprovincial” is the product of dummy “Rural Hukou” and dummy “Interprovincial Immigrant”. “Rural  $\times$  Intraprovincial” is the product of dummy “Rural Hukou” and dummy “Interprovincial Immigrant”. “Interprovincial  $\times$  Primary”, “Interprovincial  $\times$  Junior High”, “Interprovincial  $\times$  Senior High”, “Interprovincial  $\times$  Professional” and “Interprovincial  $\times$  Bachelor” are the product of dummy variable “Interprovincial Immigrant” and the education level dummy

variables respectively.

The independent variable “Age” is the age of the person at the time of the interview. “Age Square” is the square of age. “Siblings” is the number of brothers and sisters the person has. Ln (Income) is the log form of annual income of the person interviewed.

Regression (4) estimates the factors that influence the probability of claiming public social security. We are especially concerned about the parameters of “Interprovincial Immigrant” and “Rural Hukou” and the interaction terms with respect to the group of people with income. In the group with income, being a member of Interprovincial Floating Population significantly and strongly reduces the probability of getting social security. In the group without income, being a member of Interprovincial Floating Population has no significant effect on the probability of getting social security. In the group of people with income, having Rural Hukou slightly increases his/her probability of getting social security. This can be explained by the promotion of the New Rural Healthcare Cooperatives in rural China. In 2009, 830 million people (more than 80% of the national rural population) are included in the system (National Health and Family Planning Commission of PRC, 2009). Also, the coefficient of the dummy “Urban Location” is negative and statistically significant, which means that compared to people living in urban areas, people living in rural areas are more likely to get social security. Regression (4) also shows that for group with income, higher education level has significant effect on the probability of getting public social security. All dummy variables for education levels have positive and significant parameters except “Education Above Bachelor”. The dummy “Education Above Bachelor” is not significant, probably because the observations of people with such attainments are too few in the sample (25 out of 5927). And there is no interprovincial floating population with degree higher than bachelor in the sample. We see the two interaction terms “Interprovincial × Senior High” and “Interprovincial × Professional” have significant and positive coefficients. It means that compared to the rest of the people with similar highest education level, individuals in the Interprovincial Floating Population get greater advantage from getting a degree of senior high school and professional school.

Regression (5) shows that being a member of Interprovincial Floating Population is positively correlated with personal income, while Rural Hukou significantly lowers personal income. This explains why migration to urban areas from rural areas is so attractive. The positive influence of higher education level is also shown in the outcome. Parameters of each dummy variable of education level are all significant and positive and a higher education level has a larger corresponding parameter. Also, if the person works in an agricultural sector, his/her income will not be significantly different from those who do not have a job, such as the retired people. This is probably because the rural people are relatively more self-sufficient (Yang H, Zhang X, Zehnder A J B, 2003), which means any of their goods and services they produced are not sold on market.

**Table 17: Correlation between Annual Expenditure, Saving Rate and Hukou**

Dependent Variables	Ln (Expense)	Saving Rate
Ln (Family Income)	0.388*** (0.0222)	0.397*** (0.0190)
Interprovincial Immigrant	0.156 (0.163)	-0.132 (0.175)
Intraprovincial Immigrant	0.141** (0.0612)	-0.0949* (0.0577)
Rural Hukou	-0.211*** (0.0365)	0.0873*** (0.0330)
Rural × Interprovincial	0.164* (0.0978)	-0.0846 (0.101)
Rural × Intraprovincial	0.0729 (0.126)	0.0102 (0.101)
Oldest Person in Family	-0.00490*** (0.00113)	0.00341*** (0.00105)
Youngest Person in Family	-0.00674*** (0.00103)	0.00466*** (0.000905)
Family Size	0.0185 (0.0136)	-0.00668 (0.0106)
Interprovincial × Family Size	-0.0278 (0.0367)	0.0146 (0.0424)
Urban Location	0.0980*** (0.0338)	-0.0159 (0.0320)
Labor Ratio	-0.136*** (0.0472)	0.0815** (0.0414)
Interprovincial × Labor Ratio	-0.183	0.172

	(0.146)	(0.152)
Family Work in Agricultural Sector	-0.171***	0.158***
	(0.0370)	(0.0345)
Province Beijing	0.0690	0.00566
	(0.0764)	(0.0741)
Province Tianjin	0.0735	-0.0929
	(0.102)	(0.106)
Province Shanghai	-0.00487	0.0288
	(0.0509)	(0.0532)
Province Zhejiang	-0.0396	0.0274
	(0.0739)	(0.0672)
Province Guangdong	-0.140***	0.0759
	(0.0503)	(0.0528)
Observations	2,792	2,514

The table reports the results of Regression (6) and (7). Robust standard errors are in parentheses. \*\*\*, \*\* and \* denote significant level significance at the 1%, 5% and 10% levels respectively.

There are 8 dummy variables in the regressions. Except those introduced in Table 16, the dummy variable “Family Work in Agricultural Sector” indicates the interviewed family work in agricultural sector. Note that the dummy variables “Interprovincial Immigrant”, “Interprovincial Immigrant” and “Rural Hukou” report the type of Hukou of the person who is interviewed in the survey. “Ln (family Income)” is the log of a family’s annual income. “Oldest Person in Family” and “Youngest Person in Family” are the age of the oldest member and youngest member in the family respectively. “Family Size” is the number of members in the family. “Labor Ratio” is the ratio members with labor income to the family size. There are 4 interaction terms. Except those introduced in regression (4) and (5), “Interprovincial  $\times$  Family Size” is the product of “Interprovincial Immigrant” and “Family Size”. “Interprovincial  $\times$  Labor Ratio” is the product of “Interprovincial Immigrant” and “Labor Ratio”.

In Regression (6), being a family of Interprovincial Floating Population does not significantly influence annual consumption given the same income level. However, if family members have Rural Hukou, their annual consumption is significantly smaller given the same income level. But the interaction term “Rural  $\times$  Interprovincial” marginally positive and significant. The parameter of dummy variable “Rural Hukou” is -0.211 with significant level 1% and the parameter of “Rural  $\times$  Interprovincial” is 0.164 with significant level 10%. It may

show that the rural people who migrate to urban area have higher expenditure compare to the people who stay at rural area, but their expenditure is still lower than the people with Urban Hukou. The variable “Oldest Person in Family” and “Youngest Person in Family” have negatively small but significant parameter. It means that if the family has some very old or young members, the total family expenditure will be lower. In addition, by the parameters of “Urban Location” and “Agricultural Sector”, if the family stay in rural area or work in agricultural sector, the family’s expenditure is significantly lower. As we said before, this can be explained by rural family’s self-sufficient economic life and lower prices in rural areas.

In Regression (7), we remove the 5% highest saving rate and the 5% lowest saving rates to exclude outliers. The regression is performed with 2514 observations. The outcome shows that whether the family members belong to Interprovincial Floating Population is not significantly correlated with their saving rate. But Rural Hukou has significantly positive correlation with saving rate given the same family income level. Both the “Oldest Person in Family” and “Youngest Person in Family” have significant and positive correlation with the saving rate. We also see that higher labor ratio implies higher saving rate. If family members work in an agriculture sector, the family tends to have higher saving rate. None of the interaction terms included in the regression are statistically significant. We can conclude, when other factors are controlled, being a member of Interprovincial Floating Population does not significantly influence the saving rate but having Rural Hukou implies higher saving rate.

## **8. Conclusion**

Issues pertaining to the Floating Population are very popular topics in China, not only because it is a very good example of massive internal migration in a developing country, but also because it has strong impact on regional economy. However, there has been little research focusing on the Fiscal Impact from Floating Population to public finance. One reason may be the difficulty of collecting data.

In this paper, we calculate the marginal net fiscal contribution of Interprovincial Floating Population by classifying fiscal expenditures and income into different categories and

apportioning them to each individual. Also, we report regressions in order to estimate the correlations between a person's Hukou type and economic status. The regression outcome can help us justify and explain the outcome of our imputations of marginal net fiscal contribution.

The results of our imputations show that the Urban Hukou Interprovincial Floating Population definitely contributes to local fiscal budget. The Rural Hukou Interprovincial Floating Population's direct fiscal contribution is not clear. But we can expect that compared to Urban Hukou Interprovincial Floating Population, each individual Rural Hukou Interprovincial Floating Population on average contributes less to the local fiscal.

There are many issues that the research fails to elucidate. Due to the lack of data, we have to make many assumptions, which reduces the precision of analysis. Due to the lack of data, we can only work with data for year 2009. But this research shows that the topics we touch upon deserve further attention. This is so not only for China, but also for other countries, especially for the member countries of the European Union, where rapid influx of immigrants has become a major political issue. The choices we have made in order to work with imprecise data may be useful in conducting research about those countries as well.

## Appendix 1.

### Official Chinese Name and English Name of Each Fiscal Income or Expenditure

地方财政税收收入	Tax Revenue
地方财政契税	Tax on Contracts
地方财政营业税	Business Tax
地方财政资源税	Resource Tax
地方财政房产税	House Property Tax
地方财政印花税	Stamp Tax
地方财政车船税	Tax on Vehicles and Vessels Use
地方财政烟叶税	Tobacco Tax
地方财政国内增值税	Value-Added Tax
地方财政企业所得税	Company Income Tax
地方财政个人所得税	Personal Income Tax
地方财政土地增值税	Land Appreciation Tax
地方财政耕地占用税	Tax on the Use of Arable Land
地方财政城市维护建设税	Urban Maintenance and Development Tax
地方财政城镇土地使用税	Urban Land Using Tax
地方财政其他税收收入	Other Taxes
地方财政非税收入	Non-tax Revenue
地方财政专项收入	Special Revenue
地方财政罚没收入	Fines and Penalties
地方财政行政事业性收费收入	Administrative and Institutional Charges
地方财政其他非税收入	Other Non-tax Revenue
地方财政一般预算支出	Expenditure
地方财政环境保护支出	Environment Protection
地方财政交通运输支出	Transportation
地方财政一般公共服务支出	General Public Services
地方财政城乡社区事务支出	Urban and Rural Community Affairs
地方财政文化体育与传媒支出	Culture, Physical Education and Media
地方财政资源勘探电力信息等事务支出	Mining Power and Information Affairs
地方财政外交支出	Diplomacy
地方财政国防支出	Defence
地方财政科学技术支出	Science and Technology
地方财政地震灾后重建支出	Earth Quake Rebuilding
地方财政国债还本付息支出	Interest Payment for Domestic and Foreign Debts
地方财政粮油物资储备管理等事务	Cereals Oil and Reserve
地方财政教育支出	Education
地方财政公共安全支出	Public Order and Security
地方财政医疗卫生支出	Medical and Healthcare
地方财政金融监管支出	Banking
地方财政农林水事务支出	Agriculture Forestry and Water Conservancy
地方财政住房保障支出	Housing for Social Security Purpose
地方财政社会保障和就业支出	Social Security and Employment
地方财政其他支出	Other Expenditures

Data Source: Finance Year Book of China, 2010, NRC

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