

**Income Inequality in Urban China:
A Comparative Analysis between Urban Residents and Rural-Urban Migrants**

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1. Introduction

The reform initiated in the late 1970s has transformed China from a planned economy to a market-based economic system. With more efficient allocation of resources, China's economy has boomed since then, achieving an average annual GDP growth rate of 9.5% for the last 30 years.¹ Benefited from the economic success, people's overall welfare has improved as well. Household income and the consumption per capita increased more than eight times from 1979-2008.² Meanwhile, hundreds of millions of people have lifted out of poverty. According to the international standard, poverty headcount ratio dropped from 84% in 1981 to 16% in 2005.³

The transformation of production pattern also accompanies a changed model of income distribution. In the age of centrally planned economy, personal income was suppressed at a low level but relatively equally distributed. In the process of economic reform and privatization, although the well-being of everyone has been far better, some people earn much more than others, making income inequality an increasingly serious problem in contemporary China. The Gini coefficient, a measure for inequality of distribution, rose from less than 0.30 at the beginning of the reform to 0.46 in 2006 (Chen et al. 2010). In contrast, the Gini coefficients remain around 0.30 in some other transition economies like the countries in Eastern Europe.⁴

In the 1980s, the primary designer of China's reform, Deng Xiaoping predicted that the reform would have some people get rich first, but he also emphasized that the goal of the reform is allowing all the people to achieve richness eventually.⁵ Nearly 30 years later, given the enlarging income gaps in China today, his words are catching more attention than ever before, driving scholars and policy makers to improve the relationship between economic growth and wealth distribution. This article primarily focuses on the income and wealth inequality in urban China.

The income inequality in China can be mainly reflected along several dimensions: the inequality between urban and rural areas, the inequality within rural and within urban area, the inequality between coastal and interior regions, the inequality between the state-owned sectors and the non-state owned sectors, and the inequality across industries and occupations. Among these sorts of inequality, the rural-urban income gap is the principal contributor to overall inequality in China, and has attracted most attention from researchers so far. Some 60% of income inequality in China is attributed to the rural-urban disparities (Sicular et al. 2007, Chen et al.

¹ GDP growth (annual %), World Development Indicators, the World Bank, 1978-2008

² National Bureau of Statistics of China, 2009

³ Poverty headcount ratio at \$1.25 a day (PPP) (% of population), World Development Indicators, the World Bank

⁴ GINI index, World Development Indicators, the World Bank, 1960-2005

⁵ Deng Xiaoping made these remarks when he met a delegation of American entrepreneurs in 1985.

2010).

The huge rural-urban income gap in China is a problem that has been lasting for a long time, and can be summarized in following aspects. First, the economic policies of the planned economy were more in favor of the industrialization and the city rather than the agriculture and the countryside. Agricultural products could be only purchased and distributed by state at a low price, and the profits were used for industrial construction, which is an approach widely adopted by the central planned economies (Lin et al. 2003). As a result, the farmers gained little, and the citizens in the non-agriculture sector gained more. The income gap between the two groups was 1: 2.56 in 1978.⁶

Second, although China changed its agriculture policies and raised purchasing prices and subsidies in the countryside after the economic reform, with the rural-urban income gap narrowing to 1: 1.86, urban development far surpassed rural development after that, widening the income gap between the two groups to 1: 3.3 in 2009.⁷

More importantly, China's demographic distribution and rural-urban dual household registration system (the *Hukou* system) is viewed as the major reason for the persisting gap (khan et al. 1998, Sicular et al. 2007). The *Hukou* system ties urban and rural residents to their places of original residence through a residential permit which cannot be easily change. In the era of the planned economy, rural residents, accounting for more than 80% of the total population, were strictly restricted to live in the countryside and engage in farming. Since urban areas could not create many work opportunities in the industry and the service sectors during that period, the urbanization rate of China merely increased from 10.6% to 17.9% between 1949 and 1978.⁸ Therefore, whereas overall income inequality at that time was limited and was attributed to the heavy weight of rural population, the income gap between city and countryside was larger than most other countries (Li 2004, Cai 2007).

As the process of reform pushed forward, labor demand increased markedly in the cities. As a consequence, the *Hukou* system has been gradually loosened to an extent which enables the surplus labor in rural areas to move into cities for jobs. Some of the migrants earned an urban *Hukou* through obtaining a long-term formal contract, buying a house or graduating from college, but for most of them, their registration identity remains unchanged. Today about 620 million people live in urban areas for at least six months a year; however, only 72% of them hold an urban *Hukou* (Cai, 2010). In other words, around 170 million people who are originally from rural areas work or live in the cities with a rural *Hukou*. In this study, this group is called rural-urban migrants, migrants or migrant workers (*Nongmingong*), and their urban counterparts with an urban *Hukou* are called urban residents or urbanites. Different sources of inequality between and within these two subgroups in urban China are discussed in this paper.

The ongoing rapid urbanization accompanies a fast development period in China, and is

⁶ National Bureau of Statistics of China, 1978

⁷ National Bureau of Statistics of China, 2009

⁸ National Bureau of Statistics of China, 1949-1978

probably the most important societal change currently and in the future decades. Thus, many studies of inequality in China have shifted to analyzing urban China instead of rural-urban inequality. Benjamin et al. (2005) use the data from China Health and Nutrition Study (CHNS) and obtain a similar finding that the Gini coefficient for urban income distribution increased from 1991 to 2002. Chotikapanich et al. (2007) also find a fast growing income gap within urban regions based on the data from the Nation Bureau of Statistics (NBS). A recent study suggests that the rising inequality within urban areas is contributing to 23% of total income inequality in China in 2006 compared to 3% 30 years ago (Chen et al. 2010).

Income inequality within urban areas is enlarging, but the mentioned studies do not illustrate what role rural-urban migrants play in this process due to lack of data for this subgroup in most surveys. Using 2002 CHIP data, Sicular et al. (2007) first calculated income inequality between rural and urban areas without including rural-urban migrants in either group, and then they did a similar calculation with adding the migrant sample to the group of urban residents. The finding is that the impact of including subsample of rural-urban migrants on rural-urban gap is modest. One possibility is that the income gap between migrants and urbanites is small so that the included migrant sample has little impact on the urban income level. It is also possible that the sample of migrant workers is too small to generate a pronounced impact. In fact, both factors can be true, and this study will explore more details for the same dataset.

It is certainly true that rural-urban migrants are benefited from the dynamic urbanization movement and earn much more money from non-agriculture work in cities. Khan and Riskin (2005) indicated that the total income of rural-urban migrants was more than two times that of rural residents who stayed in the countryside for farming. In a survey conducted in Guangdong province, the most economically developed province with the largest rural-migrants inflows, Huang (2010) found that the earnings of rural household without a migrant were roughly half of what a rural-urban migrant household earned in Guangdong.

The large inflow of rural-urban migrants who mainly engage in manual labor in the sectors of manufacturing, construction and low-end service have made remarkable contribution to China's development. However, they are more likely to earn less than those original residents with an urban *Hukou* due to a variety of barriers including labor discrimination, weak bargaining power, human capital deficits, lack of skills and knowledge and so forth (Demurger et al. 2008). The *Hukou* system still embeds certain rights and benefits to the birth status of an individual even 30 years after the reform, serving as a main cause of those barriers. For example, the students with a rural *Hukou* cannot enjoy the same educational opportunities as urban students in the cities (Li 2008). To better understand both subsamples, this study analyzes the impact of the related factors on the inequality within the subgroups of migrant workers and urban residents.

Four categories of income are defined and analyzed in this paper, including wage income, business income, property income and transfer income. Wage income is all sorts of compensation paid by employers, including salaries, bonus, allowances, and subsidies. Although wage is the principal income source in urban China, it is found wage income as a share of total income declined from 1987 through 2001 according to the NBS data, while the Gini coefficient

continuously rose in the same period with an increase in inequality of other sources (Benjamin et al., 2005).

Business income is the earnings from self-employed jobs including family business. In addition to working in those labor intensive industries, many rural-urban migrants also start their own business in cities, with a result that business income becomes their major income source, although much fewer of their urban counterparts are self-employed.

Property income defined as the earnings and gains from assets, which is an increasing share of income in urban areas. Earnings from deposit interest, financial investment, and house leasing are included in this category. China opened its stock markets in the late 1980s and implemented a series of reforms in the financial sector, so individuals have had more investment opportunities to increase their income.

Moreover, China initiated its housing reform in 1998, when housing became commercial instead of a state-offered good. As more urban residents have the property rights of their housing, rents become an additional income source if they have extra apartments to lease. On contrary, while there is no limit on rural-urban migrants in terms of buying houses in the cities, few of them have financial capacities to own their own houses in urban areas, so renting is the only option for most of them. Frick et al. (2003) indicate rents are a factor of income inequality between occupiers and renters. Khan and Riskin (1999) also find that housing-related income is correlated with the enlarging income gap in urban China. This study does not directly calculate the housing income due to the limit of the CHIP data, but the effect of housing assets on asset inequality for both subgroups of urban residents and migrant workers will be examined.

Transfer income refers to the social benefits paid by government, including public pensions, public healthcare coverage, unemployment subsidies, food prices subsidies, social relief funds and other types of subsidies. Since China's social security system is highly attached to the *Hukou* system, rural-urban migrants cannot enjoy the same level of social benefits as their urban counterparts in terms of pension, healthcare, public housing, education and other social protections. A survey conducted by the Ministry of Agriculture shows that only 10% of rural-urban migrants were covered by medical insurance and 15% by a pension scheme in 2005 (Li, 2008). Again, the datasets used in this study do not record the details of transfer income for migrants, but the information available in them can also make analysis of its impact on overall income inequality by comparing both subgroups.

Household assets can serve as another proxy for the inequality in urban China. With the deepening of market reform and the release of property law, property rights are more valued in China. As a family earns more money, its amount of assets of different kinds is likely to accumulate and increase. The categories of assets analyzed in this paper include financial assets, privately-owned houses, durable goods, personal productive fixed assets, and other assets. Financial assets are traditionally the major source of Chinese household assets because of the saving pattern in China (Zhao and Ding, 2007). Families of urban residents and rural-urban migrants have different structures of assets. This study examines how each source contributes

to the inequality of overall wealth for both subgroups.

Aside from analyzing the inequality of income and assets within subgroups of urban residents and rural-urban migrants, this paper discusses how demographic and labor characteristics can contribute to the inequality within both subgroups and makes comparison between them. Methods of regression-based decomposition are employed to realize this objective. Knight and Song (2007) use similar approach to decompose wage structure in urban areas. Yue et al. (2005) apply decomposition to analyze income inequality among urban residents. But both studies fail to include the rural-migrant group in their models, and fail to depict a whole picture of urban China in terms of income inequality in the new century. Demurger et al. (2008) identify the effect of socio-demographic factors such as age, schooling, work experience, and work status as the main contributors to income gap between the two groups. However, their study fails to analyze how each factor contributes to the inequality, so my study will produce more detailed decompositions within groups.

Along with factor decomposition, several relevant covariates are discussed in this article, including ownership, contract status, occupation, and industry. The economic reform has led to a large scale of reconstruction and privatization of the state-owned enterprises (SOEs). More people have shifted to working in the non-state sector, but there are still many working in the state-related sector including government, public institutions and SOEs. Employees in this sector are likely to obtain more subsidies and bonus than those work in the non-state sector, earn more because of the monopoly position of their employers (Wang and Wing, 2011), so it is worth finding out the impact of employer ownership on individual income. Also, contract status is an indicator of labor relation between employers and employees. Employees with short-term contracts are likely to earn less than those with long-term contracts, so contract status is as well an important factor for income distribution. Moreover, income inequality among various occupations and industries is raising increasing concerns. The market economy has yielded more diverse industries and types of jobs, which is profoundly affecting the structure of the labor market. The paper addresses all these respects in the factor decomposition models.

Regional effects are critical factors in terms of income inequality since it is strongly related to labor flow and urbanization. Regional imbalance of development is dramatically prominent in China compared to most other countries. Thanks to fundamental advantages in geography, capital, human resource, infrastructure, and favorable policies, eastern and coastal areas are much more developed than central and western regions in many ways. With labor market becoming more mobile, enormous surplus labor from countryside flowed into eastern and coastal regions, especially Yangtze River Delta and Pearl River Delta for work. Given the large difference among regions in China, this study incorporates regional effect analysis into both subgroup decomposition and factor decomposition.

In summary, this paper will make a comprehensive comparison between the groups of urban residents and rural-urban migrants in terms of inequality. The first step is to examine income inequality indices for both subgroups. Through subgroup decomposition, the “within group” inequality and the “between group” inequality will be calculated. The next step is to analyze

how the related factors contribute to income inequality within subgroups and to make a detailed comparison between subgroups based on their characteristics. The last step is to perform source inequality decomposition of personal income and household assets for both subgroups and further compare the two subgroups. In addition to quantitative analysis, this paper will discuss policy implications to address income inequality problems in urban China based on the results of group comparison.

The paper is structured as follows. Section 2 describes and summarizes the data used in this study, and explains how the data are collected in urban China. Section 3 introduces the decomposition methodology employed in this study, including both subgroup decomposition, regression-based factor decomposition, and source decomposition. The results of the decomposition are presented and interpreted in Section 4. Section 5 is an extended discussion part that compares the two subgroups based decomposition results and subgroup characteristics. Concluding remarks are presented in Section 6.

2. Data

This study uses the data collected under the *China Household Income Project* (CHIP) which was conducted by the Institute of Economics, Chinese Academy of Social Sciences (CASS). The researchers at the CASS developed a set of survey instruments to measure income inequality and related variables. The project was implemented under the framework of the National Bureau of Statistics (NBS), which enabled the specific surveys of the CHIP to be added to the NBS's national household surveys covering both urban and rural China. In other words, the samples of the CHIP were the subsamples of the annual NBS household survey samples with additional CHIP questions. There have been four rounds of the CHIP surveys thus far, which were sampled in 1988, 1995, 2002 and 2007 subsequently.

The first two cycles of the project did not include the sample of rural-urban migrants who live in cities for most of time a year. Without this sample, the results of studies could overestimate the household income gaps between rural and urban areas, and underestimate personal income inequality within urban areas. To capture the impact of drastic urbanization on income distribution in modern China, the CHIP included rural-urban migrants as a sample for the first time in 2002. As the 2007 CHIP datasets are not yet available to the public for research, this study only employs the 2002 datasets for decomposition analysis, making it impossible to picture the trend for this subgroup in terms of income distribution in recent years in the fast growing urban China.

The NBS adopts a two-stage procedure to sample households with an urban *Hukou* in cities. At the first stage, the cities nationwide were classified into categories depending on their population size. Then the cities in each category were grouped into six geographical regions. After sorting these cities according to average wages within each category, the NBS randomly selected the sample cities, ensuring that there are one million workers in each category. At the second stage, sample sub-districts, sample neighborhood committees (*Juweihui*), and sample

households were selected by the NBS. There are 6835 urban households from 24 cities in 12 provinces recorded in the 2002 CHIP datasets. 20632 urban residents in these datasets represent around 450 million urban residents nationwide in that year.

Following a similar procedure, rural-urban households were selected from 19 cities in the same 12 provinces. In each province, provincial capital city and one or two middle-sized cities were selected for the rural-urban migrant sample. 200 households were chosen in each eastern and central sample province, and 150 households were selected in every western sample province. Within each province, 100 households were sampled in capital city and 50 in other provincial cities. There are totally 2000 rural-urban migrant households and 5327 migrants recorded in the 2002 CHIP datasets.

Coverage of Migrants

There are several limitations of the CHIP data. First, responsible for enumerating data in the field, the NBS does not have published documents detailing how the sample household committees and sample households were selected and how randomized selection was implemented. Second, the NBS samples are based on household registration system rather than on the census. If migrants had chosen not to report to the *Juweihui* about their migration, they would have been missed in the sample. Also, the response rates for both groups in this survey are not found in the relevant documents. Third, the representativeness of the NBS data has been doubted. The sample probably under represents both the richest and poorest households (Riskin, 2001). The richest households are not easily to be documented by household committees and be interviewed by enumerators. Even though some rich households do not decline the surveys, they may under-report their income and assets. For poorest families living in fringed areas or sub-urban regions that are difficult to find, their income information is likely to be omitted by the surveys as well. In this sense, overall inequality in urban China could probably be underestimated.

For rural-urban migrant group specifically, since the rural-urban migrant households were also selected from neighborhood committees, significant undercoverage may exist in the 2002 CHIP data. There are two types of household for migrants in Chinese cities. One is family household (*Jiating Hukou*) which means that family members and relatives live together in rented apartments within urban communities which have *Juweihui*. These households are required to report to and register in the local *Juweihui*. The other type is collective household (*Jiti Hukou*) which means that the *Hukou* identity of migrants is linked to their employers. For those rural-urban migrants who live on construction sites, factories, and dormitories near workplace arranged by employers, their typical registration status is collective household (Treiman et al. 2005). People with an urban *Hukou* may hold collective households as well when they work in another city before marriage. In the CHIP data, sampling limitations have those migrant workers who live out of residential communities excluded from the sample. Consequently, all the migrants recorded in the CHIP are in family households rather than in collective households.

It is reported that only 26% of the rural-urban migrants sampled by the CHIP work in the

construction, manufacturing or social service sectors, much lower than the actual proportion it should be⁹. In contrast, over half of the rural-urban migrants are self-employed in the cities according to the CHIP dataset, which is higher than the real-world situation (Huang, 2010). Typically, migrant employees earn less than those migrant small business owners. Thus, the results of the CHIP data may overestimate the average income of the rural-urban migrant subgroup (Demurger et al., 2008). Furthermore, local *Juweihui* may miss recording migrants who fail to report their family household status. Some rural-urban migrants may refuse to voluntarily get registered at the *Juweihui* for the complicated registration procedure or other various reasons. Once the migrants report their migration to *Juweihui*, they would be required to apply for temporary residency permits which ensure their legitimacy of stay in the cities. The opportunity costs of these procedures may prevent them from self-reporting, so even the migrants of family households are probably be under-covered as well. Despite all these limitations, the CHIP is still the first project that records the detailed information about the income and assets of rural-urban migrants.

Measurement of Income

The measurement of income is of importance because income inequality is very sensitive to how well the income is measured. Income normally consists of cash and in-kind earnings, including wages, business income, transfer income, and property income. The imputed rents of owner-occupied housing are also viewed as an important source of in-kind income. Disposable income includes government subsidies and transfers with taxes subtracted (Smeeding and Weinberg, 2010). Household income surveys usually cover part of these income sources because of various research objectives or design limitations. The CHIP data identifies the four income sources which are wage income, business income, transfer income, and property income, consistent with the NBS income definition. To address the shortcomings of the NBS data, the CHIP data record more detailed information on different types of subsidies and housing income.

For the CHIP, the selected households in urban areas were required to record their income and expenditures for three successive years and were interviewed by the NBS enumerators every month (Li et al, 2008). To ensure the accuracy of the survey, the NBS designed a cash account and an in-kind account for each respondent household, and the recorded data were checked by more than 10,000 enumerators. However, the measurement of income of the CHIP still has several limitations. First, the survey did not record the transfer income for the rural-urban migrants. While the transfer benefits for this subgroup are far less than those for urban residents, the total income for the migrants can be undervalued in the CHIP data. Second, there is limited information on taxes such as income tax and payroll tax in the CHIP datasets, so the disposable income is unable to be measured. Third, the total income and the income of each source are recorded in separate datasets. Only the datasets that have total income contain individual characteristics for urban residents and migrants, and the datasets with income source

⁹ The migrant workers in these three sectors account for over 60% of migrants in urban China, Ministry of Human Resources and Social Security, 2009

data have no individual information. Therefore, to conduct subgroup decomposition and factor decomposition, this study has to use total annual or hourly income which is the sum of wage income, business income, property income and transfer income as the income decomposition target.

As the measurement of income easily has many drawbacks, many studies adopt other measures such as consumption as proxies to evaluate economic well-being or wealth inequality (Meyer and Sullivan, 2010). This study insists using income as the research measure for following reasons. First, durable goods are not purchased frequently, and the migrants do not buy some kinds of durables in the cities because they have them in their home villages. Second, services are difficult to be valued, especially in a transition economy like China where many service industries just began to emerge. Third, individual income and household expenditures are recorded in the separate CHIP datasets, making it impossible to link household expenditures to individual or household characteristics for meaningful analysis. Most importantly, the availability of consumption data is limited. Although the CHIP data contain some household consumption information, only the minimum monthly expenditures are recorded for both subgroups of urbanites and migrants. For those consumption items measured in exact values, either migrant subgroup or urban resident subgroup misses some categories in the CHIP datasets. The unmatched data make group comparison impossible.

Table 1 shows the individual characteristics of urban residents and rural-urban migrants who have income sources aged at least 16 years old. These covariates are correlated with the income distribution of individuals and are included in the decomposition models in the next sections.

Table 1. Individual descriptive statistics for urban residents and rural-urban migrants, 2002

	Urban Residents		Rural-Urban Migrants	
	Mean	Std. Dev.	Mean	Std. Dev.
Age	40.57	9.19	34.71	8.77
Years of schooling	11.41	3.00	7.92	2.78
Years of working in cities	20.20	9.66	7.05	5.06
	%		%	
Male	55.59		56.94	
Communist party member	28.88		3.39	
Married	88.20		89.80	
Long-term contract	73.79		17.48	
Public sector	71.94		11.30	
Self-employed	6.78		66.01	
# of observations	10,062		3,363	

Source: CHIP data

For demographic measures, urban residents receive more education and have far more work experience in urban areas. Rural-urban migrants are younger than their urban counterparts, and have just 7.92 years of education and 7.05 years of work experience in cities on average. Nearly

30% of urban residents are communist party members, but only 3.4% of the migrant workers belong to the party. It is not surprising that just 17.48 migrants own long-term contracts, because of their work experience and the attribution of the sectors they work in. 71.9% of the urbanites work in the public sector including government, state-owned enterprises (SOE) and public institution such as public schools and hospitals. In contrast, only 11.3% of migrants work in the non-public sector, and more than 60% of them are self-employed. It is the result of sampling method adopted by the NBS, by which a large amount of migrant employees in the construction, manufacturing, social services sectors are not included. Thus, the two subgroups are different in many individual characteristics in this sample.

3. Methodology

The approaches of inequality decomposition can be divided into two categories which are decomposition by population subgroups and by factor components in general (Wan and Zhou, 2005). This study adopts both types of decomposition to analyze urban income inequality in China. For subgroup decomposition, the Theil index is extensively employed for detailed analysis. For factor decomposition, regression-based method is used to examine how related factors contribute to income inequality for both subgroups. Moreover, this study employs the Gini concentration ratio to assess how each income and asset source contribute to overall income and wealth inequality respectively.

Decomposition by Subgroups

The Theil index is another important measure for inequality other than the Gini coefficient. The Theil index is one of generalized entropy measures which could be decomposed by subgroups of population, regions, income sources and so forth. Theil T statistic is a tool that is usually used to decompose a measure that has an underlying hierarchy. The smaller the Theil index is, the more equal the distribution is. The Theil T can be expressed as:

$$T = \frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\bar{y}} \right) \ln \left(\frac{y_i}{\bar{y}} \right) \quad (1)$$

where n is the number of individuals in the population, y_i is the income one individual, and \bar{y} is the population's average income. If the population is made of several subgroups, then the Theil T statistic can be divided into two components, the within group element (T^w) and the between group element (T^b). Function (1) can be expressed as:

$$\begin{aligned} T &= \sum_{k=1}^m \left(\frac{n_k \bar{y}_k}{n \bar{y}} \right) T_k + \sum_{k=1}^m \frac{n_k}{n} \left(\frac{\bar{y}_k}{\bar{y}} \right) \ln \left(\frac{\bar{y}_k}{\bar{y}} \right) \quad (2) \\ &= \sum_{k=1}^m S^k T_k + \sum_{k=1}^m S^k \ln \left(\frac{\bar{y}_k}{\bar{y}} \right) \\ &= T^w + T^b \end{aligned}$$

The first term in (2) is the weighted average of the Theil T indexes of each group (T_k) with weights represented by the total income share, serving as the within part of the decomposition. The second term is the Theil index calculated using subgroup means (\bar{y}_k), serving as the

between part of the decomposition.

The decomposition by regions can follow the similar logic. In the CHIP data, there are 12 provinces or municipalities, namely Beijing, Shanxi, Liaoning, Jiangsu, Anhui, Henan, Hubei, Guangdong, Chongqing, Sichuan, Yunnan, and Gansu. They can be clustered into three region groups. Eastern region is composed of Beijing, Liaoning, Jiangsu, and Guangdong. All of them were ranked top ten in terms of GDP per capita in 2002. Central region comprises Shanxi, Anhui, Henan, and Hubei provinces. Western region includes Chongqing, Sichuan, Yunnan, and Gansu. It is expected that the Theil index for each region group is different. Moreover, the Theil index can be decomposed by subgroups according to ownership, party membership, employment status, additional three factors that are carefully examined in this study.

Decomposition by Factors

The decomposition by subgroups is not applicable unless the sample can be grouped based on categorical variables. Thus the effect of continuous variables on inequality is omitted by the previous approach. In fact, income measures or statistics of income inequality can be also decomposed by factor components, which can widen the decomposition horizon. Also, this method is able to help reflect the impact of underlying contributing factors, such as gender, education, work experience, on income inequality to surpass the limits of subgroup decomposition for further analysis.

The regression-based decomposition is a typical method of this sort. Developed from the original model proposed by Blinder and Oaxaca in the 1970s, several researchers have invented new models to decompose inequality by factor components. Shorrocks (1982, 1999) developed a framework of decomposition based on the marginal effects of factors on inequality or Shapely Value. Wan (2004) improved the work of Shorrocks by taking constant term and residual into account in his model. Morduch and Sicular (2002) adopted a straightforward approach by using linear regression for the decomposition of estimates. Fields (1998, 2003) used semilog income function to decompose inequality. This paper chooses Fields' model which is a direct way to analyze how causal factors makes contribution to overall inequality.

In the model of Fields, the semi-log regressions or income-generating functions can be written as:

$$\ln(y_i) = \alpha + \sum_j \beta_j x_{ij} + \varepsilon_i \quad (4)$$

and
$$\ln(y_{it}) = \alpha_t Z_{it} \quad (5)$$

where $\alpha_t = [\alpha_t \beta_{1t} \beta_{2t} \dots \beta_{jt} 1]$ and $Z_{it} = [1 \ x_{i1t} \ x_{i2t} \ \dots \ x_{ijt} \ \varepsilon_{it}]$

The log-variance of income can be decomposed as:

$$s_j(\ln y) = \frac{\text{cov}[\alpha_j Z_j, \ln y]}{\sigma^2(\ln y)} = \frac{\alpha_j \sigma(Z_j) \text{cov}[Z_j, \ln y]}{\sigma(\ln y)} \quad (6)$$

where $s_j(\ln y)$ is the contribution of the j^{th} factor to income inequality statistics. Neglecting the

constant term, the function (4) is of the same form used by Shorrocks (1982).

Following Fields, this study proposes a regression model that could be used to decompose income inequality for the subgroups of urban residents and rural-urban migrants respectively in China as follows.

$$\ln y = \alpha + \beta_1 \text{gender} + \beta_2 \text{education} + \beta_3 \text{experience} + \beta_4 \text{experience}^2 + \beta_5 \text{party} + \beta_6 \text{contract} + \beta_7 \text{ownership} + \beta_8 \text{occupation} + \beta_9 \text{industry} + \beta_{10} \text{region} + \varepsilon \quad (7)$$

where y is the hourly income per person; education represents years of schooling; experience represents years of work experience in cities; party is a dummy variable that denotes the membership of communist party; and contract is a dummy variable that differentiates long-term contract and short-term contract. Ownership is a dummy variable distinguishes if an individual works in the public sector or the non-public sector. The public sector includes government, public institutions, central and local SOEs, state share-holding companies, collective enterprises, and other state-related work units. The non-public sector includes private companies, foreign companies, joint ventures, self-owned businesses, and other non-state employers.

Occupation is a categorical variable that contains three values which are ordinary worker, professional or technician, and director or owner. Industry is a categorical variable including three values. For urban residents, industry is divided into manufacturing, service, and government. For rural-urban migrants, industry is divided in a different way, including manufacturing, wholesale and retail, and other services. The reason why wholesale and retail is separated from service is that 47% of the migrants engage in this sector making it prominent in this sample. These three categories are the combination result of more than 20 industries for both subgroups. Then region is a categorical variable that includes eastern, central, and western regions.

Based on the coefficients of each covariate and the shares of the log-variance, Fields model gives the contribution of each factor included in the regression model to inequality of income, which is presented in form of percentage. For the rural-urban migrant subgroup, given that over half of them are self-employed, this study further divides this subgroup into those who are employees and those who are self-employed. Ruling out contract and ownership, the regression-based decomposition is applied to compare the contribution of each factor to inequality between the two newly generated groups.

Decomposition by Sources

As discussed already, the total income can be divided into four general categories according to income sources. The CHIP data record the amount of wage income, business income, property income, and transfer income for the urban residents at the individual level. For the rural-urban migrant households, the amount of wage income, business income, and property income are seen as income sources. Transfer income of migrants is not included in the dataset probably because quite few of them enjoy the social benefits directly from governments in urban areas,

and this source accounts for a minimal share of their total income.

In the CHIP data, wage income includes salaries, subsidies, and other income from work. Property income includes interests from deposits, dividends for share-hold, insurance benefits, dividends from other investment, house-rent income, income from intelligent property, and other asset income. Transfer income for the urban residents includes pension, social relief subsidies, public unemployment compensation, public insurance benefits, benefits from public housing funds, and subsidies for the elderly.

Lerman and Yitzhaki (1985) proposed decomposing the Gini coefficient by income sources based on the covariance formula of the Gini Index. The proportion of income from the i^{th} income source in total income is S_i :

$$S_i = \frac{\bar{y}_i}{\bar{y}} \quad (8)$$

Where \bar{y}_i is the mean of income from the i^{th} source; and \bar{y} is the mean of total income.

The Gini concentration ratio¹⁰ for income from the i^{th} income source can be expressed as:

$$G_i = \left(\frac{2}{n\bar{y}_i} \right) \text{cov}(y_i, F(y_i)) \quad (9)$$

The correlation between total income and the income from the i^{th} source or the correlation effect for i^{th} income source is:

$$R_i = \frac{\text{cov}(y_i, F(y))}{\text{cov}(y_i, F(y_i))} \quad (10)$$

The Gini coefficient for total income is therefore:

$$G_t = \sum_{i=1}^n S_i G_i R_i \quad (11)$$

Then, the proportional contribution of the i^{th} source to overall inequality in terms of the Gini coefficient can be expressed as:

$$P_i = \frac{S_i G_i R_i}{G_t} \quad (12)$$

By this means, the contribution of each income source to overall income inequality can be measured. Moreover, this study further decomposes property income of urban households, seeking to analyze the impact of housing rents on inequality. Following the same approach for income decomposition, the household assets can also be decomposed by asset sources. Through decomposition and comparison, this study examines how financial assets, housing, fixed production assets, durable goods, and other assets contribute to overall asset inequality for the households of urban residents and rural-urban migrants.

4. Results

¹⁰ It is also called Pseudo Gini coefficient

Decomposition by Subgroups

All the inequality indexes for income analysis are calculated on the basis of income distribution. Two types of income are discussed here, annual income and hourly income. Table 2 shows the distribution of both annual income and hourly income by decile division for the subgroups of urban residents and rural-urban migrants. The Gini coefficients can be acquired through calculation.

For annual income, the top 20% richest urban residents earn 6.15 times more than the bottom 20%. The ratio for the migrants is just a bit smaller. For hourly income, the gap between the top 20% and the bottom 20% enlarged to 7.73 within the urban resident group, while the ratio for the migrant group narrows very slightly. However, the inequality for the migrant group is actually greater than that for the group of urban residents. The Gini coefficient shares a similar trait the Theil index, which is that the smaller the index is, the more equal the distribution is. The Gini coefficient of annual income is 0.345 for the urbanites and 0.367 for the migrants. As for hourly income, the Gini coefficient for the urban resident group rises to 0.382, and that for the migrant group also increases to 0.419. The results of the Theil index confirm the two conclusions acquired above. First, income inequality within the migrant group is greater than that within the group with an urban *Hukou*. Second, the inequality of hourly income is greater than that of annual income.

Table 2. Income distribution and inequality indices by subgroups, 2002

Decile	Annual Income		Hourly Income	
	Urban resident	Migrant	Urban resident	Migrant
10	2.51	3.01	2.03	2.97
20	6.71	7.54	5.68	7.72
30	12.06	13.06	10.58	13.28
40	18.62	19.29	16.71	19.29
50	26.48	26.35	24.21	26.36
60	36.39	34.37	33.16	34.46
70	47.00	43.96	43.67	43.91
80	58.76	55.47	56.10	55.22
90	74.05	69.32	71.71	68.70
100	100	100	100	100
Ratio of top to bottom quintiles	6.15	5.91	7.73	5.80
Gini coefficient	0.345	0.367	0.382	0.419
Theil T index	0.208	0.294	0.267	0.381
Mean income	12,183	9,620	5.73	3.24

Source: CHIP data

The means of income give more information about the money each subgroup earns. Urban residents earn 12,183 yuan a year, and rural-urban migrants earn 9,620 yuan per year. The income ratio between the two subgroups is 1.27. However, it is well known that migrants work

longer per day and work more days per month in China (Li, 2008). The respondents in the survey report that the urbanites work 23.19 days a month and 8.15 hours per day on average, and that the migrants work 26.32 days a month and 10.14 hours every day. As a result, the hourly income ratio between the two subgroups is 1.62, larger than that of annual income by 27.6%. Given that the labor protection and relevant policies still have many problems to be resolved, hourly income, rather than annual income, is better measure that can more accurately reflect the labor relation and the individual ability of earning money in China.

Combining urban residents and rural-urban migrants together, Table 3 presents the Theil indices for the total urban population to describe overall income inequality. For annual income, the Theil index is 0.231, a value between that of each subgroup. For hourly income, the Theil index is 0.310, larger than that of annual income.

Table 3. Theil decomposition for overall urban population by subgroups, 2002

	Urban resident	Migrant	Within Subgroup		Between Subgroup		Overall
Annual income	0.208	0.294	0.226	97.9%	0.005	2.1%	0.231
Hourly income	0.267	0.381	0.285	92.0%	0.025	8.0%	0.310

Source: CHIP data

Following the method introduced in Section 3, Table 3 also gives the results of decomposition by population subgroups. When the Theil index is expressed as the sum of a within subgroup term and a between subgroup term, it can imply the percentage of contribution of each component to overall inequality. For annual income, the inequality between the subgroups accounts for 2.1% of overall inequality, but this figure grows to 8.0% when hourly income is decomposed. Therefore, the inequality between urban residents and migrants is greater in terms of hourly income. To grasp the real differences between the two subgroups, the following analysis use hourly income for a variety of further decomposition.

Aside from decomposing Theil index by population subgroups, other categorical variables of interest can be used for decomposition as well. Here region, ownership, party membership, and employment status are taken into account, and the comparative decomposition results and categorical income data are shown in Table 4.

To begin with, the means of hourly income in each category are compared between the two subgroups. A basic truth is that urban residents have more income than migrants in every category. Specifically, for urban residents, the average income in eastern, central, and western regions is 7.09, 4.68, and 5.13 yuan. It is a little surprising that those in western region earn more than those in central, as central provinces are generally a bit more economically advanced than western provinces. For rural-urban migrants, their earnings in these regions are 4.02, 2.82, and 2.74 yuan on average respectively, making central region surpass western region this time. As expected, the urbanites working in government, public institutions or SOEs earn much more than those in the non-public sector, with hourly income of 6.13 yuan versus 4.55 yuan. In contrast, the migrants in the public sector earn less than those migrants in the non-public sector.

This result can be partly explained by the fact that most of the migrants in the non-public sector are private businessmen, and that migrants in public can only occupy very low-level positions such as cleaners in most cases. Communist party members earn more than non-party members for both subgroups, but the gap is larger for urban residents. There is a sharp difference in income between the two subgroups if population is divided according to self-employment status within subgroups. For urban residents, the self-employed earn 3.61 yuan per hour with those who are employed earning 5.88 yuan per hour. For rural-urban migrants, the situation is completely different. The self-employed migrants earn 3.32 yuan an hour, more than those who have employers by 0.26 yuan per hour.

With regard to income inequality, the Theil index is highest in eastern region for both subgroups. It is interesting that inequality has a positive correlation with income among regions in this sample, which means that for urban migrants the inequality in western region is greater than that in central region and that the regional relation is reversed for the migrant group. The inequality in the public sector is smaller than that in the non-public sector for both subgroups. Yet difference appears when it comes to party membership. The income distribution is more equal among urban party members compared to non-party members, but the inequality is a bit greater among party members than among non-party members for the migrant group. It is consistent for both subgroups that the inequality within the self-employed group is greater than within the employee group.

Table 4. Theil decomposition by interested characteristics for subgroups, 2002

		Urban Resident		Rural-Urban Migrant	
		Income	Theil T	Income	Theil T
Region	eastern	7.09	0.269	4.02	0.409
	central	4.68	0.224	2.82	0.302
	western	5.13	0.240	2.74	0.361
Ownership	public	6.13	0.235	3.11	0.230
	non-public	4.55	0.355	3.25	0.399
Party membership	member	7.27	0.218	4.41	0.396
	non-member	5.10	0.273	3.19	0.379
Self-employed	self-employed	3.61	0.494	3.32	0.443
	employee	5.88	0.251	3.06	0.247
Overall		5.73	0.267	3.24	0.381
Decomposition		within	between	within	between
Region		0.249	0.018	0.365	0.016
	%	93.3	6.7	95.7	4.3
Ownership		0.259	0.008	0.381	0.0001
	%	97.2	2.8	99.9	0.1
Party membership		0.253	0.014	0.379	0.002
	%	94.7	5.3	99.5	0.5
Self-employed		0.261	0.006	0.381	0.0002
	%	97.9	2.1	99.8	0.2

Note: The decomposition target is hourly income

Source: CHIP data

The Theil index is further decomposed by the four categorical variables mentioned above. By lateral comparison, income inequality between regions is greater for the urban resident subgroup than that for rural-urban migrant subgroup. The conclusions are similar for ownership, party membership, and employment status decomposition. By vertical comparison, the greatest inequality between categorical subgroups exists in region category, followed by party membership. Put it in another way, the inequality among regions contributes more to overall inequality, compared to the other three variables.

Decomposition by Factors

Given that the dominant part of urban income inequality in China can be explained by the inequality within subgroups of rural-urban migrants and urban residents rather than by the inequality between the subgroups, the following comparative analysis primarily focuses on within group inequalities by making detailed comparison between the two subgroups. The regression-based decomposition method proposed by Fields is applied here to examine the contribution of the relevant factors to income inequality for both subgroups in urban China. Table 5 illustrates the statistics of semi-log regression of income for urban residents.

Table 5. Income regression results for urban residents, 2002

Variable Group	Independent Variable	coefficient	t-statistics
Gender	Female	-.099**	-7.60
Education	Years of schooling	.058**	23.87
Experience	Years of working	.032**	12.98
	Years of working ²	-.0004**	-6.95
Party membership	CCP member	.090**	5.71
Contract	Long-term	.221**	13.31
Ownership	Public sector	.179**	11.51
Occupation (Ordinary worker omitted)	Professional / Technician	.256**	14.93
	Director / Owner	.179**	7.89
Industry (Manufacturing omitted)	Service	.013	0.91
	Government	.158**	7.15
Region (Eastern omitted)	Central	-.411**	-27.65
	Western	-.317**	-20.09
Constant	Constant	.211**	5.24
		Adjusted R ²	0.3085
		F-statistic	346.20
		N	10062

Note: 1. The dependent variable is the logarithm of hourly income

2. *significant at 5 percent level **significant at 1 percent level

Source: CHIP data

As the results show, male urban residents earn 9.9% more than females. Education is important, since a 5.8% growth of income would accompany an additional year of schooling. Also, those

who have more work experience would earn more, with 3.2% income increase for an additional year of working. The income of communist party members is 9% more than that of non-party members. Contract status is a more critical factor. Those who have a permanent or long-term contract would earn 22.1% more than those with short-term contracts or no contract, who have probably started their career for not a long time.

Urban residents who work in government, SOEs or public institutions earn more than those in the non-public sector as expected. Professional workers or technicians have more income than ordinary workers by 25.6%, and they also earn more than directors or business owners. People who work in the service sector earn just a little more than those in the manufacturing sector, but government staff earn much more than manufacturing workers by 15.8%. Consistent with the results shown in Table 4, the hourly income of urban residents in the eastern region is higher than the other two regions, and people in those western provinces earn a bit more than those in central provinces.

Table 6 presents the regression results for the rural-urban residents following the same approach. The income gap between men and women is bigger, compared to the subgroup of urban residents. The income of male migrants is 22.1% more than that of female migrants.

Table 6. Income regression results for rural-urban migrants, 2002

Variable Group	Independent Variable	coefficient	t-statistics
Gender	Female	-.221**	-9.63
Education	Years of schooling	.046**	11.15
Experience	Years of working	.035**	6.21
	Years of working ²	-.001**	-3.73
Party membership	CCP member	.086	1.39
Contract	Long-term	.139**	4.22
Ownership	Public sector	.016	0.42
Occupation (Ordinary worker omitted)	Professional / Technician	.226**	4.01
	Director / Owner	.066**	2.12
Industry (Manufacturing omitted)	Wholesale / Retail	-.362*	-10.70
	All other services	-.284**	-8.60
Region (Eastern omitted)	Central	-.297**	-11.16
	Western	-.314**	-11.31
Constant	Constant	.752**	13.19
Adjusted R ²		0.1915	
F-statistic		62.00	
N		3349	

Note: 1. The dependent variable is the logarithm of hourly income

2. *significant at 5 percent level **significant at 1 percent level

Source: CHIP data

Education is also important for this group, and an additional year of schooling would result in 4.6% more earnings. The conclusion for work experience is quite similar for this subgroup

compared to the urban residents. The gap of income between party members and non-party members is wider for migrants than urban residents. Also, those with long-term contracts earn about 13.9% more than those with short term contracts or on contract. The impact of ownership on income is minimal for migrant subgroup, and the difference between the public sector and the non-public sector is not statistically significant.

For rural-urban migrants, professional workers earn 22.6% more than ordinary workers, and business owners earn just 5.8% more than ordinary workers. Perhaps most of the private businessmen in this sample are small business owners (*Getihu*) like stand owners. It is striking that manufacturing industry provides the most earnings among the three industry sectors. Migrants engaging in wholesale and retail, who account for a large share in migrant population in the sample, earn 3.6% less than manufacturing workers. Migrants in other service industries have fewer earnings than manufacturing worker by about 2.8%. Echoing the results in Table 2, migrants in the eastern region earn the most, then the central region second, and migrants in the western region earn the least.

Through decomposing log-variance of income, the contribution of each explanatory factor to income inequality and their rankings are summarized in Table 7. Education and region are the most crucial factors for income inequality for both subgroups. For urban residents, education matters the most, while region effect matters the most for rural-urban residents. In the subgroup of urban residents, work experience occupies the third place, followed by occupation, contract status, employer ownership, and industry according to priority.

Table 7. The contribution of each explanatory factor to income inequality for subgroups, 2002

	Urban Residents $S_j(\ln y)$ %	Ranking	Urban-Rural Migrants $S_j(\ln y)$ %	Ranking
Gender	0.89	9	3.38	4
Education	7.26	1	4.41	2
Experience	5.26	3	2.14	5
Party membership	1.39	7	0.12	8
Contract	2.82	5	0.35	7
Ownership	2.55	6	0.01	9
Occupation	4.31	4	0.78	6
Industry	1.04	8	3.67	3
Region	5.41	2	4.60	1
Residual	69.07		80.54	
	100		100	

Source: CHIP data

Other than the first two factors, the sequence of other covariates based on contribution is quite different for migrants, compared to their urban counterparts. Industry is the third most important factor to income inequality, followed by gender, and work experience. The determinants of occupation, contract status and employer ownership have little impact on the

inequality within this subgroup. In general, there are no prominent covariates that contribute to income inequality among migrants, because the contributions of the first four factors by rankings are close.

From rankings, there are six factors that are more important for urban residents than for rural-urban migrants in terms of income inequality. They are education, work experience, occupation, employer ownership, contract status, and party membership. These characteristics are more valued by employers and have clear distinctions in urban China, which leads to income inequality within the subgroup of urbanites. On the contrary, there are also three factors that contribute more to inequality for migrants than for urban residents by comparison of rankings. They are region, industry, and gender. Because of the fact that most rural-urban migrants are self-employed, these covariates which are less related to labor relationship between employers and employees are relatively more critical to income inequality for the migrants in urban China.

Given that self-employed migrants and those migrants who work for employers are different in many respects such as occupation, industry, and work experience, the migrant subgroup can be further divided into two groups depending on whether one is self-employed. Following the same method of regression-based decomposition, contribution of each factor to inequality can be analyzed for each group. Variables ownership and contract are removed from the regression, since the self-employed migrants have less distinctive values in these two variables. The regression results for both groups are summarized together in Table 8.

The impact of each covariate included in the regressions is generally consistent with the conclusions for overall rural-urban migrants discussed already. The income gap between males and females are greater for the migrant employees than the self-employed. Work experience seems not to be a significant factor for the migrants who are employed, which is a little surprising. Similarly, party membership is not a significant covariate for both the employees and the self-employed.

For the migrant employees, professional workers or technicians earn more than ordinary workers by 33.6%, a conclusion more similar to that for those urban residents. Yet the advantages of professional workers or technicians are not very eminent for those who are self-employed, since the coefficient is not statistically significant. With regard to industry, the self-employed migrants in the wholesale and retail sector earn 38.0% less than those in the manufacturing sector, compared to the gap of 26.7% for the migrant employees. The self-employed migrants in the eastern region earn 28.7% and 30.8% more than those in the central and western region respectively. The two figures for those who are employed are 29.6% and 30.5% respectively.

Table 8. Income regression results for self-employed migrants and migrant employees, 2002

Variable Group	Independent Variable	Self-employed	Employee
Gender	Female	-.201**	-.257**
		(-6.98)	(6.72)
Education	Years of schooling	.041**	.055**
		(7.76)	(8.27)
Experience	Years of working	.044**	.022
		(5.87)	(2.55)
Party membership	CCP member	-.001**	-.0003
		(-3.87)	(-0.70)
Occupation (Ordinary worker omitted)	Professional / Technician	.146	.041
		(1.61)	(0.50)
Industry (Manufacturing omitted)	Owner / Director	-.121	.336**
		(-0.98)	(5.46)
Region (Eastern omitted)	Wholesale / Retail	.078	.173
		(2.17)	(1.03)
Constant	Constant	-.380**	-.267**
		(-8.26)	(-4.92)
Region (Eastern omitted)	All other services	-.251**	-.310**
		(-5.08)	(-7.12)
Region (Eastern omitted)	Central	-.287**	-.296**
		(-8.68)	(-6.70)
Region (Eastern omitted)	Western	-.308**	-.325**
		(-8.57)	(-7.44)
Constant	Constant	.866**	.757**
		(11.00)	(9.18)
Adjusted R ²		0.1635	0.2552
F-statistic		40.37	36.23
N		2217	1132

Note: 1. the dependent variable is the logarithm of hourly income

2. t-statistics are in parentheses

3. *significant at 5 percent level **significant at 1 percent level

Source: CHIP data

The contribution of each covariate to income inequality for each group of migrants is calculated following the same method of regression-based method. Table 9 provides the rankings and comparison results for both groups. For those who are self-employed, region is the most contributing factor to inequality, followed by industry, education, gender, and work experience. These five factors have generally equal share of individual contribution. Covariates such as party membership and occupation contribute very little to inequality for the self-employed migrants.

As for rural-urban migrant who have employers, the most important factor is education, followed by gender, region, industry, occupation, and work experience. Party membership accentually has minimal effect on income inequality for who are employed. Moreover, the first

five covariates that contribute the most have equal share in their individual contribution in general. Among all the determinants, region, industry, education, and gender are the common four factors that make contribution most, reflecting their importance to both groups.

Table 9. The contribution of each factor to income inequality for migrant subgroups, 2002

	Self-employed Migrant $S_j(\text{Iny})$ %	Ranking	Migrant Employee $S_j(\text{Iny})$ %	Ranking
Gender	2.78	4	4.68	3
Education	3.44	3	6.59	1
Experience	2.46	5	1.97	6
Party membership	0.17	6	0.09	7
Occupation	0.08	7	3.31	5
Industry	3.46	2	4.66	4
Region	4.37	1	4.95	2
Residual	83.24		73.75	
	100		100	

Source: CHIP data

By comparison of rankings, there are four factors that are more prominent for the self-employed than for the employees in terms of income inequality. They are region, industry, work experience, and party membership. There are also three factors that are more critical for the migrant employees than for the self-employed. They are education, gender, and occupation. Thus, education is more valued by employers, making it a factor that leads to greater inequality. Also, income inequality among regions is more critical for the self-employed, although it is strong for those who have employers.

Decomposition by Sources

As introduced in the previous section, the total income at the individual level can be decomposed by income sources. The decomposition results of the total income and its four types of sources for both subgroups of urban residents and rural-urban migrants are illustrated in Table 10. For each source, its amount share for the total income, the Gini concentration ratio, and its contribution to the overall Gini coefficient are summarized. When the Gini concentration ratio of one source is lower than the overall Gini concentration ratio which is shown in the last row, this income source has an equalizing effect for overall inequality, or this income source can reduce overall inequality level.

For urban residents, wage income accounts for 72.16% of total income. Its Gini concentration ratio is 0.673, larger than that of total income, so wage income increases the inequality level, and it contributes 75.94% of overall inequality for urban residents. Business income is only a small share in total income, but since its Gini concentration ratio is smaller than the overall value, it has an equalizing effect. Property income occupies the smallest proportion among all sources of income, and it slightly equalizes overall inequality. Transfer income accounts for

23.31% of total income, with a Gini concentration ratio of 0.544. Therefore, transfer income equalizes income inequality, contributing 19.80% of the overall Gini coefficient.

Table 10. Source decomposition for personal income of subgroups, 2002

	Urban Resident			Rural-Urban Migrant		
	Income share %	Gini C_i	Contribution %	Income share %	Gini C_i	Contribution %
Wage income	72.16	0.673	75.94	39.96	0.259	27.93
Business income	3.33	0.591	3.07	59.76	0.446	71.99
Property income	1.20	0.633	1.19	0.28	0.110	0.08
Transfer income	23.31	0.544	19.80	-	-	-
Total income	100	0.640	100	100	0.371	100

Source: CHIP data

For rural-urban migrants, the scenarios are completely different. Wage income just accounts for 39.96 of their total income, and its concentration ratio is 0.259, lower than that of total income. With an equalizing effect, it contributes 27.93% of overall inequality. Business income has the largest share of 59.76% for total income. Its concentration ratio of 0.446 makes its share of inequality contribution increase to 71.99%. Property income is merely a very small share of total income and even smaller share of overall inequality. As the transfer income is not recorded for the migrants, this source is not accounted. Given that few migrants can enjoy urban social benefits, its contribution should be a limited portion.

Although property income is a very small part of total income, decomposition of property income by sources is conducted to analyze the effect of house rent on inequality. Since only the data of each income source of urban residents is available, the analysis is merely for this subgroup, whereas just 6% individuals in this subgroup have property income. Table 11 gives the decomposition results.

Table 11. Source decomposition of property income for urban residents, 2002

	Income share %	Gini C_i	Contribution %
Deposit interests	16.18	0.972	15.92
Dividends from share-holdings	18.66	0.985	18.61
Dividends from other investment	12.13	0.998	12.25
Insurance benefits	2.12	0.985	02.11
House-rent income	44.40	0.992	44.58
Intelligent property income	0.62	0.989	0.62
Others	5.89	0.993	5.92
Total property income	100	0.988	100

Source: CHIP data

House rent is the most important source and accounts for 44.4% of total property income for

urban residents. Due to its relatively high Gini concentration ratio, house-rent income increases the inequality level of property income. Following house rent, deposit interests, dividends from share-holdings, and dividends from other investment accounts for more than 10% of total property income and overall inequality each. Among them, deposit interests and dividends from share-holdings have equalizing effects.

The inequality of assets is another metric for measuring the inequality of wealth. In addition to consumption and spending, people transform their extra earnings into a variety of assets, such as financial assets, housing, durable goods and so forth, through accumulation over time. Through decomposition by sources, the contribution of each asset source to overall asset inequality can be measured. The CHIP data contains household assets records for both subgroups of urban residents and rural-urban migrants. Comparison in asset inequality is made between the two subgroups. Table 12 provides the average assets of each category for both subgroups, and inequality indices for total assets are also calculated and shown in the table.

Table 12. Household assets value and inequality indices for total assets in urban China, 2002

	Urban Resident	Rural-Urban Migrant	Overall
Financial assets	39,736	19,116	35,068
Housing	84,462	10,320	67,679
Fixed productive assets	2,462	3,402	2,675
Durable goods	9,170	3,118	7,800
Other assets	1,872	802	1,630
Total assets	137,702	36,758	114,852
Gini coefficient	0.467	0.749	0.543
Theil T index	0.403	1.319	0.551
# of observations	6,835	2,000	8,835

Source: CHIP data

Urban residents have 137,702 yuan of assets totally per family on average, much more than migrants with 36,748 yuan of total assets per household. The ratio between the two subgroups in terms of total assets is 3.75, far higher than that for total income which is 1.27. Granted that those migrants also own some assets at their home villages, the gap in urban assets can sufficiently reflect the difference in wealth between the two subgroups.

With regard to each asset source, the value of housing accounts for a large proportion in total assets. The gap of housing value between the two subgroups, which is 8.18, is even larger than that of total assets. In fact, only 12% of the migrant households have their own houses in cities in this sample, compared to 84% of urban households. As for financial assets, most of urban and migrant households have deposits which account for the largest share in financial assets. The ratio of financial assets between the two groups is 2.08, smaller than that of total assets. Similarly, urban households own more assets than migrant households in durable goods and other types of assets. Migrant households have more fixed productive assets than their urban counterparts, because over half of them operate their own business which requires more

investment in fixed assets for production.

The Gini coefficient of total assets for the total urban population is 0.543 which is also larger than that of total income. Within the subgroup of urban households, the Gini coefficient of total assets is 0.467, compared to 0.749 for the subgroup of migrant households. Thus, the distribution of assets is more unequal for migrant households than for urban households. The results of the Theil index support the conclusion above in terms of inequality relation.

Table 13 summarizes the results of assets decomposition by sources. For the households of urban residents, housing assets has the heaviest weight, accounting for 61.34% of total assets. With a Gini concentration ratio of 0.488, it increases the inequality level of assets, contributing 63.63% of overall asset inequality. Following housing assets, financial assets have the second largest share of 28.86% in total assets. It also contributes about the same proportion to overall inequality. Durable goods has 6.66% share of total assets, and it has an equalizing effect on overall inequality, as its concentration ratio is lower than that of total assets.

Table 13. Source decomposition for household assets of subgroups, 2002

	Urban Resident			Rural-Urban Migrant		
	Asset share %	Gini C_i	Contribution %	Asset share %	Gini C_i	Contribution %
Financial assets	28.86	0.464	28.48	52.00	0.704	48.32
Housing	61.34	0.488	63.63	28.08	0.903	33.45
Fixed productive assets	1.79	0.496	1.89	9.25	0.812	9.92
Durable goods	6.66	0.346	4.90	8.48	0.549	6.15
Other assets	1.35	0.381	1.10	2.19	0.749	2.16
Total assets	100	0.470	100	100	0.758	100

Source: CHIP data

For migrant households, financial assets rather than housing have the largest share of 52.00% in total assets. Its Gini concentration ratio is lower than that of total assets, so it reduces overall inequality level of assets. Housing has the second largest weight with 28.08%, but its Gini concentration ratio is much higher than 0.758 which is the value for total assets, so housing actually enlarges overall inequality level of assets, with a 33.45% contribution weight. Fixed productive assets and durable goods have similar weights in total assets. However, durable goods have an equalizing effect on overall inequality, yet fixed productive assets have an opposite effect.

In summary, financial assets and durable goods can equalize asset inequality for both subgroups of urban households and migrant households. In contrast, housing and fixed productive assets can increase the inequality level of assets for both subgroups.

5. Discussion

Based on the results shown in the previous section, this section further summarizes the general conclusions of income inequality in urban China, and extends the discussion focusing on some specific factors such as education, social security, and housing. Moreover, policy suggestions are provided along with the analysis of each highlighted point.

Income Level and Inequality Level

Rural-urban migrants earn 21.3% less than urban residents in terms of total income, and 38.3% less in terms of hourly income. Yet income inequality level for the migrant subgroup is greater than that for the subgroup of urban residents, according to the results of the Gini coefficient and the Theil index. It appears that income level and inequality level have a negative relationship when comparing the two population subgroups. However, if the sample is divided by regions, the conclusion would be different. Taking urban residents and rural-urban migrants together, the average hourly income in eastern, central, and western regions is 6.34, 4.21, and 4.50 respectively. The Gini coefficient for the three regions is 0.415, 0.375, and 0.399.¹¹ So the level of inequality increases with the growth of income across regions, reflecting a positive relationship between income level and inequality level.

Kuznets attempted to explain the correlation between income level and inequality level last century (Brenner et al. 1991). According to his theory, income inequality of a country would increase when the country is accumulating wealth with industrialization and urbanization. After inequality level attains a certain point, it would decrease with the increase in income per capita. The relationship between the two can be expressed by an inverted U-shaped curve or the Kuznets curve. China, as a developing country, is still experiencing rapid economic growth and urbanization, had not reached its turning point at least by 2002 (Wang and Fan, 2005), so the first stage of development in Kuznets' theory can help explain China's situation in 2002. If the three regions are taken as three different stages of development, the relationship between their economic inequality levels and income levels are consistent with the theories proposed by Kuznets.

In testing this rule for both subgroups of urban residents and rural-urban migrants separately, the relationship for the urban resident subgroup corresponds with the theory of Kuznets. For migrants, although the eastern region with highest income level also has the highest income level, the western region, where the income level is slightly lower than that in the central region, has a higher level of income inequality than the central region. Thus, apart from the factor of development stage, there are other factors affects the level of income inequality. Plus, the different characteristics of urban residents and migrants also have influence on inequality in many ways, so more explanations can be made based on factor decomposition and group comparison.

¹¹ Author's calculation

Education and Region

Among the nine factors included in the regression-based decomposition model, education and region are the top two factors that make greatest contribution to income inequality for both urban residents and rural-urban migrants. No other variables can rank among top five for both subgroups at the same time according to Table 7. Within the migrant subgroup, comparing those who are self-employed and those who have employers, the top three critical contributors are education, region, and gender. Thus, education and region are the most crucial factors to income inequality in urban China.

With development of economy and upgrading of industry, human capital becomes an increasingly important factor for production and growth. People who have more years of education are more likely to obtain a good job after graduation, get promoted in later career, and receive a better pay. Therefore, when more job opportunities are created in cities and more people flow into urban areas, education has become a more crucial selection criterion in labor market than before and a determinant factor for income level and income inequality in urban China (Chi et al. 2007).

To address income inequality in urban China, promoting educational fairness and justice is a necessary step. In this sample, urban residents receive 11.41 years of education on average, and migrants have only 7.92 years of schooling. There is a gap of educational level between the two subgroups which have different characteristics and scenarios. For urban residents, most of them complete their high schools, but only around 10% of them receive higher education. In the past, a small part of high school graduates had chance to attend college due to limited resources of higher education. Before the reform of education which comes along with an admission expansion in universities in the late 1990s, people who had a college degree in the 1980s and 1990s had more advantages in job markets and competitiveness. The average age for the urban residents in this study is 40.57, and most of them fall into the age group between 30 to 50 years old, so the college degree holders in this sample received their degrees before the higher education reform. Thus, the educational differences certainly contribute to income inequality for the urban resident subgroup. With more opportunities of higher education now, the differences can be narrowed.

Normally, an individual who finishes primary school or receives at least six years of schooling is viewed as literate. If six years of schooling is set as a cutoff to divide the two subgroups and the whole sample, the results of income comparison are shown in Table 14.

In the sample, 9.66% of the individuals receive less than six years of education, and rural-urban migrants account for 70.91% of them. The hourly ratio between those who have more than six-year schooling and those who have less than six-year schooling is 1.98. As Table 1 has illustrated, the hourly income ratio between urban residents and migrant workers is 1.77. Thus, the impact of educational deficits is fairly pronounced by comparison, which means that the educational gap is a more critical factor for income inequality than the status of registration for the residents in the cities. If similar comparison is made within each group divided by education

level, this conclusion is still valid.

Table 14. Income comparison between subgroups with different education levels, 2002

	Less than 6-year schooling		More than 6-year schooling		Income ratio
	%	Hourly income	%	Hourly income	
Rural-urban Migrant	6.85	2.38	18.13	3.56	1.50
Urban Resident	2.81	3.52	72.21	5.81	1.65
Overall	9.66	2.71	90.34	5.36	1.98

Source: CHIP data

For rural-urban residents, only about 19% of them finish their high schools or receive higher education in this sample, so the educational differences for this subgroup are mainly due to the limited resources at the basic education level across country. Migrants are more likely to choose working at an early age because of relatively high opportunity costs of schooling. Also, basic education is coupled with the *Hukou* system in many ways, so the educational gap between urban residents and migrants are extremely prominent at this level. For the second generation of migrants, if they want to enter the public schools in the cities where their parents work, they need pay a relatively large amount of temporary schooling fee which most of them cannot afford. They can also enter those private schools opened in suburban areas, but these schools offer low-quality education, and the fees they charge migrants children for are higher than the public school tuitions paid by urban students (Yan, 2005).

According to a CASS survey¹², about 80% of the migrants are not willing to transfer to get an urban *Hukou* because of various reasons. The two main ones are that mobility is generally not linked with the *Hukou* system anymore and that the fixed assets such as land and houses at home villages are the wealth they can depend on in their later life. On the other hand, for those who are willing to hold an urban *Hukou*, pursuing better and equal educational opportunities and resources for their children is their principal concern. This demonstrates the difficulty that the migrants have in acquiring equal education. Given the greatest contribution of schooling to income inequality, policies should be adjusted to decouple the link between schooling and the *Hukou* system, invest more in education in both rural areas and suburban areas, and promote educational equality and fairness among all students.

The regional effect is also significant on income inequality according to the results of factor decomposition. The factor of region is more associated with the stage of development, which is linked with the theory of Kuznets. After China adopted economic reform and open-up policy, eastern and coastal areas were the first choice of investment and development for both government and investors because of its conditions in terms of geography, infrastructure, and human resources and so forth. Since then, the manufacturing and service industries in other countries have been outsourced to eastern China, making this region develop much faster than inner areas accompanied by the boost of production and trade. As a result, income inequality

¹² A speech at Financial Transformation and Economic Growth in Urbanization Forum by Zhang Yi, Chinese Academy of Social Sciences, October 28, 2010

rises as the income level grows, marking it the most unequal region in terms of income distribution. To address the inequality caused by regional factors, economic policies can be more favorable to central and western China. With the upgrading of industry in coastal areas, more opportunities will be created in central and western provinces through industry shifts. In this way, the economic development can become more balanced among regions, reducing the regional effect on income inequality.

Social Security and Housing

As the results of decomposition by income sources show, transfer income has an equalizing effect on overall income inequality for urban residents. Transfer income including subsistence allowances, price subsidy, and subsidy for elderly people can specifically help poor families in need, through which reduce the inequality level to some extent. However, although the level of social benefits is low in China in general, residents with an urban *Hukou* can get much more than those with a rural *Hukou* (Gao, 2006). China adopts a social security system that attaches social benefits to the *Hukou* system, largely because of the large share of rural population and the lasting limited fiscal ability. As a result, the coverage levels of medical insurance are different for the two types of *Hukou*. For the pension system, although the government just started to offer public pensions to rural population in 2009, and the coverage is still limited.

For rural-urban migrants, the situation is even worse sometimes. The public healthcare insurance coverage could not be transferred across region until recent reform initiatives, which means that if migrants with rural type of medical insurance need to reimburse their medical expenditures, they need to go back to where they are registered. The inconvenience discourages them to move back and forth, so many of them did not even have the health insurance for rural residents in 2002. Plus, if they are self-employed rather than being employed by employers in the cities, they are likely to have no medical insurance at all. The survey shows that only 2.5% of the migrants in the sample can have their medical spending covered, compared to 63.1% for urban residents. In this sense, the basic social benefits coverage is very limited for the migrant group, let alone other types of subsidies solely for urban residents.

In spite of the fact that China is raising the level of social security for both urban and rural residents and is increasing the coverage of various social benefits, migrant workers with a rural *Hukou* in urban areas are an easily neglected group. With the increase in fiscal revenues and expenditures, China should gradually unify the two separate systems of social security that relies on the *Hukou* system. When the migrants can enjoy the same level and the same types of social protection as do the urban residents, the equalizing effect of transfer income can really work for the migrants.

As Table 12 shows, among all the property income sources, house rents contribute the most to overall property income inequality, and it can increase in the inequality level. 84% of the urban households in this sample live in their own houses, with a sharp contrast of 12% for migrant households. Before the housing reform in the late 1990s, urban residents live in public apartments allocated by employers or government. The distribution of public housing is often

not equal and more based on political consideration (Zhao and Ding, 2008). After the housing reform initiatives, individuals have been allowed to buy the houses they live in, with certain levels of subsidies depending on specific employers, so the initial allocation of self-owned housing is inherently unequal. With the opening of real estate market, households that have extra money are able to buy additional commercial houses, allowing wealthy households to own more than one house for investment. Since then, house rent has become an important income source for some families. Whereas only 1.2% of the households in this sample have house-rent gains, this type of income accounts for the largest shares in property income for urban households.

Yet for migrant households, over 80% of them have to rent houses in the cities according to the survey. Although the amount of house-rent income is not recorded for this subgroup, this income source can be minimal for them. The housing-related expenditures can also reflect the difference between the two subgroups. In this survey, urban households report that they spend at least 107 yuan on housing which includes rents and spending on utility, water, and gas. On the contrary, migrant households spend 202 yuan on housing, in which rents clearly occupy a dominant share. Therefore, house-rent income certainly not only increases the inequality level within the subgroup of urban households, but also raises income inequality for all households in urban China. To reduce the inequality level caused by this source, public rental housing, whose rents are lower than market prices, should be built for the low-income households in urban areas as well as for the migrant households that have lived in cities for certain years.

Income Measurement and Population Coverage

The limitations of income measurement do have impact on the inequality results and decomposition results in this study. Without recorded transfer income, income inequality for the migrant subgroup can be overestimated, given transfer income's equalizing effect on inequality. Moreover, there are many missing values of property income and business income for both subgroups. For urban residents, the missing values of transfer income are enormous too. As a result, the total income can be undervalued, which makes the inequality results inaccurate. Furthermore, without data of taxes, the income discussed in this study may not capture the welfare for urban population very well, since the economic well-being of individuals is more related to disposable income.

The shortcomings in population coverage affect the accuracy of results as well. As the poorest and the richest people were not well sampled in the survey, overall income inequality can be underestimated. Also, the survey disproportionately sampled the migrant workers, making the self-employed migrants account for over 60% of the migrant subgroup, the proportion of which is inconsistent with the real situation. As the results show, the income level for the self-employed migrants is higher than that for the migrant employees, but the inequality for the former is also much higher than that for the latter. If more migrant employees with *Jiti Hukou* are included in the sample, the inequality level for the migrant subgroups can be either higher or lower than the results obtained in this study. To better assess income inequality in urban China, improvement in income measurement and subgroup sampling is necessary.

6. Conclusion

Through different types of decomposition, this study analyzes income inequality within and between the subgroups of urban residents and rural-urban migrants in urban China, examines the effect of relevant factors on inequality within subgroups, and discusses how each source affects the overall level of individual income inequality and household asset inequality. According to the results, income inequality level for the migrant subgroup is higher than that for the group of urban residents, although the income level of the former is lower than that of the latter. The inequality level of the whole urban population sample is between that of the two subgroups, and the inclusion of migrants increases overall urban income inequality. The results from the population subgroup decomposition show that the impact of “within group” inequality far outweighs that of “between group” inequality on overall inequality. Therefore, the factors that affect the inequality within subgroups receive more attention in the latter half of this study. When each subgroup is further divided by the dummy variables of interest, the distribution of income is more equal for those who work in the public sector and for those who are not self-employed. For rural-urban migrants, most of whom are self-employed, they earn more if they work in the non-public sector, but income inequality level is also higher for the migrants who run their own business.

Among all the factors that have influence on income inequality, education and region are the two prominent covariates that contribute the most to inequality for both subgroups of urban residents and rural-urban migrants. If the migrant subgroup is divided into the self-employed migrants and migrant employees, education and region are still the two most critical factors, with the factor of gender contributing a lot as well. Therefore, equalizing educational resources for all residents should be the foremost action to promote income equality in urban China. Specifically, removing the bonds between educational opportunities and the *Hukou* system and filling the educational gap between urban students and migrant students are necessary measures for contemporary China. With regard to the regional effect, the diverse development levels across regions can explain the problem, as income inequality has strong correlation with income per capita when a country is experiencing rapid industrialization and urbanization. To address income inequality in urban areas, China should make efforts to promote economic development and narrow the disparity of economic development levels between the eastern, central, and western regions at the same time.

According to the results of source decomposition, transfer income has an equalizing effect on income inequality for urban residents, so it can play an important role in reducing inequality for total population in urban areas. Given that the social security system is coupled with the *Hukou* system in China, the inequality level for the rural-urban migrants can decrease through significantly increasing the level of social benefits and expanding the coverage of entitlements. In other words, migrants should be treated equally as urban residents. Furthermore, considering the increasing share of house-rent income in urban China after the housing reform, the government should provide more public rented apartments to low-income households, to reduce the negative effect of house-rent income on inequality. As for household assets, the gap

between urban residents and rural-urban migrants is even larger than the income gap, so is the inequality level of assets within each subgroup. In that assets are the accumulation of income, the measures for reducing income inequality, which help rural-urban migrants better integrate into cities, can be effective to lower asset inequality level as well.

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