How Urban Segregation Distorts Chinese Migrants' Consumption?

BINKAI CHEN [a], MING LU [b,c] and NINGHUA ZHONG [d,*]

[a] Central University of Finance and Economics, China
[b] Shanghai Jitaotong University, China
[c] Fudan University, China
[d] Tongji University, China

Summary. — This paper provides a new explanation for China's low consumption-to-GDP ratio by highlighting the constraints of the "household registration system" (*Hukou*) on China's household consumption. Our baseline results show that the consumption of migrants is 16–20% lower than that of local urban residents. We further find evidence suggesting that, caused by *Hukou* restrictions, migrants save more for precautionary purposes, have lower expectation of permanent income, and consume much less durable goods because of high mobility. Moreover, we have found no evidence that the consumption heterogeneity can be explained by migration effects, culture, or other forms of household heterogeneity. As both the number and income level of migrants are rising quickly, the constraining effects of *Hukou* on household consumption is increasing.
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Key words — *Hukou* system, consumption heterogeneity, migrants, local urban residents

1. INTRODUCTION

China's low and declining consumption-to-GDP ratio, corresponding to a high savings ratio, is regarded as an underlying cause of the U.S. housing price bubble and the global financial crisis (Greenspan, 2009). In recent years, this issue has attracted worldwide attention (e.g., Chamon & Prasad, 2010; Modigliani & Cao, 2004; Wei & Zhang, 2011). Note that China's consumption-to-GDP ratio is not only lower than that of developed countries, but also lower than economies at a similar stage of development, such as Brazil and India, as well as those with a similar culture, such as Japan and South Korea (see Section 2 for details). Therefore, there must be some specific factors that are constraining Chinese household consumption.

This paper provides a new explanation for China's low and declining household consumption ratio. Compared with the existing literature, we highlight the importance of one particular institution in transitional China, the "household registration system" (*Hukou*). The system is a state institution that retains tight control over labor mobility across regions, especially over migration from rural to urban areas, by restricting the rural population from staying in urban areas permanently. It also restricts access to state-sponsored benefits for the majority of China's rural population. The benefits range from small perks, including being able to buy a discounted city bus pass, to much more important urban services and public welfare, including enrolling children in public schools (Chan & Buckingham, 2008). An individual's *Hukou* status is inherited at birth and can be treated as almost exogenous (Afridi, Li, & Ren, 2009). Because *Hukou* determines many important aspects of life, if not the fate of China's people, the *Hukou* book, which records the location and attributes of households, has been dubbed "China's No. 1 document" (Chan, 2009).

Hukou creates two different societies (Naughton, 2007). Within each city, there are two segmented groups: local urban residents who have a local urban *Hukou* and migrants who do not have such a *Hukou*. [1] Without a local urban *Hukou*, the migrants are discriminated against within the local labor market (Friedman & Lee, 2010; Wang, Appelbaumb, Degiulib, & Lichtenstein, 2009; Zhu, 2004); for example, they are excluded from many urban jobs (Chan & Buckingham, 2008) and face many formal and informal obstacles to securing jobs (Hare, 1999). Moreover, they also have limited access to social insurance and other forms of welfare (Zhu, 2003). The urban segregation also results in migrants' unhappiness (Knight & Gunatilaka, 2010). Compared to urban residents, migrants who do not have local *Hukou* report a significantly lower happiness score, and they are more averse to the income gap between migrants and local residents (Jiang, Lu, & Sato, 2012).

Such heterogeneity has a significant impact on migrants' consumption behaviors. Our study finds that migrants' level of consumption is lower than that of local urban residents by about 16–20%. We discuss three channels through which *Hukou* restrictions reduce migrants' consumptions. First, we find evidence that suggests that migrants save more from precautionary purposes because of higher income risks and a much lower level of social security coverage. Second, we argue that migrants cannot stay in a city permanently. When they return to their hometowns, they will earn much less; as a result, they have lower expectations of permanent income compared with local urban residents at the same income level. We find stronger effects of *Hukou* on consumptions in regions

where the *Hukou* restriction is stricter, which lends support to this argument. Last, migrants are found to consume much less durable goods, such as household equipment, probably because of their high mobility that is caused by the lack of a local urban *Hukou*. We use the matching process to take into account some heterogeneity between migrants and local urban residents, including the *Hukou* status of the parents of the household head, age, income, and industry. We also conduct tests that rule out some competing hypotheses, such as the observed consumption gaps caused by migration effects or by rural culture.

The policy implication of this paper is that, *Hukou* system currently presents a major obstacle to China's efforts to rebalancing the economy; and loosening or removing the restriction would be an effective way to significantly stimulate China's aggregate consumption and domestic demand.

The structure of this paper is as follows. Section 2 presents some facts and existing explanations of China's savings ratio in the literature especially studies concerning Chinese households' savings ratio. Section 3 introduces the data, econometric model, and the matching procedure, while section 4 presents baseline results from both the whole sample and the matched sample. Section 5 discusses three channels, and section 6 conducts robustness checks that rule out some possible channels that may confound the effects of *Hukou* on migrants' consumption. Section 7 concludes with some policy discussions.

2. CHINA'S CONSUMPTION AND SAVINGS: FACTS AND LITERATURE REVIEW

(a) *China's low and declining consumption ratio*

Ever since China began its reform and opening process, its economy has been growing at an average annual rate of nearly 10%. However, economic imbalances, both external and internal, are becoming increasingly severe. In particular, China's low consumption ratio is widely believed to be the fundamental source of the imbalance that is threatening the sustainability of its long-term economic growth. Table 1 compares the consumption-to-GDP ratio of China with several other major economies.

First, in 2011, compared with either Western developed countries (for example, Great Britain, Germany, and the United States) or Asian developed countries (for example, Japan or South Korea), China's consumption-to-GDP ratio was much lower. Moreover, subtracting final consumption by household final consumption, we can find that China's government consumption is not significantly lower than other countries; instead, it is household consumption that drives down China's consumption-to-GDP ratio.

Second, developing countries usually have lower consumption ratios than developed countries. As returns on capital are often high when a country is in the early stage of economic development, people there save more, and investment accounts for a larger share of GDP. In addition, the lack of a social

safety network and financial constraints are another two reasons for a lower consumption ratio in developing countries. People who are not covered by a social safety network tend to have a precautionary motive and thus save more for unexpected events (Giles & Yoo, 2007). Moreover, underdeveloped financial market and institutions make it harder for needy people to borrow money; such financial constraints further drive up the saving of households in developing countries (Chamon & Prasad, 2010). However, being a developing country by itself is not enough to explain China's low household consumption ratio. Table 1 shows that China's ratios are lower than India by more than 20% and lower than Brazil by about 25%. Furthermore, if we compare China with Japan and South Korea during their developing period, we can still find the significant gap in household consumption ratio. For example, according to the World Development Indicators, the lowest point of Japan's household consumption ratio was 48.4% in 1970, much higher than China's 2011 ratio of 34%.

Third, if we take into account China's low level of expenditure in public areas, such as education, health, and pensions, we may conclude that the relative level of China's household consumption ratio is even lower in comparison with other countries (Aziz & Cui, 2007). After controlling for the level of economic development, the economic growth rate, demographic features, the government's fiscal policy, the development of a financial structure, urbanization, and so forth, Kraay (2000) and Kuijs (2005) find that China's household consumption ratio is still lower than the expected level by more than 10%. So, a significant part of China's low consumption ratio is not yet explained.

China's household consumption ratio is not only lower than other major countries in the world, but it has also been declining in recent years. Figure 1 presents China's consumption-to-GDP ratio and household consumption ratio. It shows that, since 2000, China's consumption ratio and household consumption ratio have been continually declining. The consumption ratio declined from 62.3% in 2000 to 48.2% in 2010, and the household consumption ratio fell from 46.4% to 34.9%. On average, the consumption ratio decreased by 1.41 percentage points each year from 2000 to 2010. We can also learn from Figure 1 that the government consumption ratio (government consumption per GDP, or the gap between the overall consumption ratio and the household consumption ratio) was almost a constant after 2000. This information indicates that China's declining consumption ratio is driven mainly by the decline in China's household consumption.

(b) *Literature review*

With regard to China's household consumption and savings, there are many explanations that have been put forth in the existing literature. The first is based on the life-cycle theory (Ando & Modigliani, 1963). The life cycle is widely found to be an important determinant of household consumption behavior. Modigliani and Cao (2004) argued that the rising share of the labor force in China's population has driven up

Table 1. *Consumption expenditure as a percentage of GDP (2011)*

Country	United States	United Kingdom	Germany	Japan	South Korea	India	Brazil	China
Final consumption expenditure (%)	89	87	77	81	69	69	81	47
Household final consumption expenditure (% of GDP)	72	64	57	60	53	57	60	34

Source: World Development Indicator (WDI), available at: http://data.worldbank.org/indicator/NE.CON.TETC.ZS and http://data.worldbank.org/indicator/NE.CON.PETC.ZS.
Note: Final consumption expenditure (formerly total consumption) is the sum of household final consumption expenditure (private consumption) and general government final consumption expenditure (general government consumption).
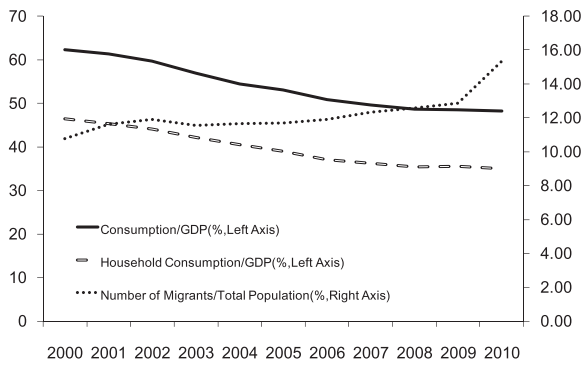
Notes: we present here estimations of the De facto Rural – Hukou in Urban Areas (Migrants)

Year	Total population (million)	De facto urban population (million)	Urban *Hukou* Population (million)	De facto Rural – Hukou in Urban Areas (million)
2000	1267.4	459.1	322.5	136.6
2001	1276.3	480.6	332	148.6
2002	1284.5	502.1	349.3	152.8
2003	1292.3	523.8	374.3	149.5
2004	1299.9	542.8	391.4	151.4
2005	1307.6	562.1	409.0	153.1
2006	1314.5	577.1	420.7	156.4
2007	1321.3	593.8	430.8	163.0
2008	1328	606.7	439.7	167.0
2009	1334.7	621.9	450.3	171.6
2010	1339.7	665.6	460.0	205.6

Sources: Compiled by Chan (2012) from annual editions of NBS

Figure 1. *China's consumption/GDP ratio and ratio of migrants.*

the savings ratio. However, Chamon and Prasad (2010) found this explanation to be inconsistent with the profile of consumption and savings at the household level in China, because older people save more than middle-aged people. They also found that the savings ratios increased across all demographic groups during 1995–2005. Furthermore, Kraay (2000) found that the life-cycle theory cannot explain the declining consumption ratio in aggregate-level data.

The second explanation is based on liquidity constraints (e. g., Aziz & Cui, 2007; Kuijs, 2005). These researchers argued that the underdevelopment of China's financial market has forced households and companies to save more and has led to a lower consumption ratio. Nevertheless, the efficiency of China's financial markets is improving as time goes by, while the household consumption ratio is still declining. This suggests that the level of financial market development is, at most, a minor factor in regard to China's household consumption.

The third explanation is based on the precautionary savings theory (e.g., Blanchard & Giavazzi, 2005; Chamon & Prasad, 2010; Giles & Yoo, 2007; Meng, 2003), which argues that China's pension, healthcare, education, and housing system reforms have increased the uncertainty of household income and expenditure, and consequently, have increased household saving. We believe that precautionary saving is an important perspective for explaining China's low level of household consumption; however, recent social safety net reforms and the increasingly wide coverage of pensions and healthcare has not led to a significant rise in China's household consumption. This issue calls for further explorations of how the precautionary saving mechanism works with China's institutional background and on the effective policies targeting it.

Finally, Wei and Zhang (2011) put forward an interesting explanation for China's rising household savings ratio. They

argue that, as China experiences a rising sex ratio imbalance, the competition in the marriage market is getting fiercer. This change has encouraged Chinese people, especially parents with a son, to postpone consumption in favor of wealth accumulation that increases the competitiveness of their son.

(c) *Hukou and migrants' consumption*

Before introducing our explanation on China's low household consumption, we want to emphasize that the urban population mainly drives the rising household savings ratio of China. This argument is made based on the following three facts. First, the average per capita income of the urban population is about three times that of the rural population in the past decade, and second, the total number of the urban population is roughly the same as the rural population. [2] Therefore, the total income of the urban population is also three times that of the rural population. Third, the average saving rate of the urban population is higher than the rural population. For example, in 2011, the average per capita income of urban and rural people was 21,810 and 6,977 yuan, and the average per capita consumption of urban and rural people was 15,161 and 5,221 yuan. So the average saving rate of the urban population was 30% and that of the rural population was 25%. [3] Therefore, savings of the urban population was the major contributor to China's aggregate household saving; and analyzing the change of the urban population's consumption and saving behavior is the key to demystifying China's saving rate puzzle.

In comparison with the existing explanations, we highlight the effects of the *Hukou* system, which is one of China's phenomenal regulations set on urban areas. *Hukou* strongly restricts the rural population from moving to and staying permanently in urban areas. It is now common for studies of China to consider the *Hukou* system as one of the main factors that defines China's economic and social features (e.g., Afridi et al., 2009; Chan & Buckingham, 2008). For example, Liu (2005) argued that the *Hukou* system is a major contributing factor to rural–urban inequality; Whalley and Zhang (2007) pointed out that *Hukou* prevents better allocation of the economic resources in China and hinders Chinese development.

In the past decade, an increasing number of rural workers left their homeland and sought jobs in cities. According to the study by Chan (2012), which provides probably the best estimations, the total number of rural *Hukou* people living in urban areas was 136 million in 2000, and the number increases to more than 200 million in 2010 (refer to Figure 1 for details).

Most of the migrants cannot get a local urban *Hukou*. Because of this restriction, this paper emphasizes that consumptions of migrants are lower than local urban residents who own a local urban *Hukou*. This is mainly caused by the following four reasons. One, migrants are not covered to the same extent by the social safety net and their jobs are less secure, so they have a stronger precautionary saving motivation. Two, migrant workers are discriminated against in the labor market (Friedman & Lee, 2010; Wang et al., 2009; Zhu, 2004), so their experience may not be fully compensated, which could affect their expectations of long-term permanent income. Three, migrants do not expect that they will live in the city permanently, but do expect that their income will decline after they return to their hometowns, so their expectation of lifetime income is lower than their urban counterparts at the same level of current income. As a result, migrants save more to smooth their lifetime consumption. And four, migrants have greater mobility [4] and, therefore, consume

fewer durable goods. In Section 5, we discuss in detail these channels with some empirical evidence.

We believe these consumption heterogeneities between migrants and local urban residents are essential for understanding the feature of China's aggregate consumption. As the total number of migrants is keeping on increasing quickly, the negative effects of *Hukou* on aggregate consumption are getting stronger, which is one of the reasons for China's declining consumption-to-GDP ratio.

3. DATA AND MODEL SPECIFICATION

(a) *Data*

In the following, we quantitatively compare the consumption of migrants with that of local urban residents. The data used in this study come from two waves of household surveys by the China Household Income Project (CHIP) for the years 2002 and 2007. In this paper, we mainly use the CHIP 2007 survey data; yet we also provide some statistics using data from some unique questions in the CHIP 2002 survey.

The CHIP 2007 survey was conducted in nine provinces: Shanghai, Jiangsu, Zhejiang, Anhui, Henan, Hubei, Guangdong, Chongqing, and Sichuan. It covers 5,000 local urban households and 4,978 rural–urban migrant households. The survey for local urban households took subsamples from the national household survey of the National Bureau of Statistics (NBS), whereas the survey for rural–urban migrant households was conducted separately. In the 2007 survey, a migrant household was selected when one of its working members was drawn from his or her work place.[5] Knight, Deng, and Li (2011) provide more detailed discussions about sampling methods of migrants. To check the representativeness of the migrants sample in CHIP 2007, we compare it with the 2009 NBS report.[6] We find that, on some key variables, the summary statistics from the two sources are quite close. For example, regarding per capita income, the mean value in the NBS report is 17,004 yuan, while that in CHIP is 17,299 yuan. In the sample in the NBS report, 23.5% (42.8%) have graduated high school or higher (have a written contract), while the number in CHIP 2007 is 22.3% (46.9%). These similarities indicate high representativeness of CHIP 2007 data of migrants.

In this paper, migrant households are identified as (1) those interviewed in the migrant survey or (2) those interviewed in the local urban household survey, but their *Hukou* statuses were either rural *Hukou* identity (rural–urban migrants) or another city's *Hukou* identity (non-local urban residents). Rural–urban migrants and non-local urban residents are different in many aspects. Nevertheless, we combine them for the following two reasons. First, our arguments regarding how *Hukou* affects household consumption apply to both groups. Second, there are only 106 non-local urban residents, accounting for about 2% of the whole migrant sample. Thus, to include or exclude this group does not affect the main results by much. To show the robustness, in column (1) of Table 8 (located in Section 6), we present the results of the baseline regressions with the 106 non-local urban residents being excluded. The estimated consumption gap is actually larger than the baseline results.

After removing observations for which major variables, such as household consumption, income, age, and employment information, are missing, we obtained 4,686 observations for urban households and 4,488 for migrant households.

(b) *Empirical specifications*

Our key empirical question is thus: when major factors that affect the consumption of local urban residents and migrants are properly controlled, do migrants have lower consumption levels than local urban residents? To test this hypothesis, we used a standard econometric specification similar to that of Charles, Hurst, and Roussanov (2009):

$$\ln C = \alpha + \beta^* \text{migrant} + \gamma^* \ln Y + \eta X + \varepsilon \qquad (1)$$

where $\ln C$ is the natural logarithm of per capita consumption.

In the survey, consumption includes eight subcategories: food, clothing, household equipment, medicine and health, communication, education and culture, housing, and other expenditures. First, we exclude other expenditures because the definitions of this term are different in the urban and rural surveys. Next, housing expenditure is a variable with serious measurement errors. Housing expenditures should include rent paid or imputed rent of owner-occupied housing. In our sample, 10.36% of local urban residents reported zero on this term, and the mean value is 1,215 yuan. In comparison, 30.45% of migrants reported zero on housing expenditure, and the mean expenditure is 1,868 yuan. These numbers do not make sense. For example, migrants are expected to have lower average housing expenditures. Without an expectation of living permanently in the city, migrants consume much less on housing than local residents. The lower average housing expenditures of local households are possibly caused by their ownership of houses (so they do not need to pay rents). Meanwhile, the higher portions of migrants reporting zero housing expenditure could be caused by their living in factory dormitories. The data do not contain enough information to impute the rents of owner-occupied housing. Moreover, estimating the rents of factory dormitories is even more difficult. So the measurement errors in housing expenditure are serious, complicated, and hard to deal with. We thus decide to exclude it. Nevertheless, it is noteworthy that the income elasticity of housing consumption of migrants is found to be much lower than that of local urban residents (Zheng, Long, Fan, & Gu, 2009).[7] If we include the *de facto* housing expenditure into total consumption, the gap between migrants and local residents will be larger. In our main analyses, we exclude housing and other expenditures and define consumption as the sum of expenditures on the remaining six subcategories.

Migrant is a dummy variable, taking a value of 1 for migrant households (as defined in Section 3(a)) and 0 for local urban residents (households with an urban *Hukou* of the city where they live). β is the coefficient of the greatest interest for the purpose of this study. A significantly negative β means that migrants' consumption is lower than that of local urban residents.

$\ln Y$ is the natural logarithm of per capita income, which is a major control variable in household consumption regressions. X denotes other controlling factors. According to existing literature on household consumptions (e.g., Attanasio & Weber, 1995; Carroll, 1994; Deaton, 1992), we control factors that include the characteristics of the head of the household, such as years of education, health status, occupation, and industry of his or her company. Furthermore, we include a set of provincial dummy variables to capture the location fixed effects. Finally, ε is the error term.

(c) *Differences between migrants and urban residents: Matching*

Table 2 presents summary statistics regarding the major characteristics of migrants and local urban residents. It shows

Table 2. *Summary statistics of major household characteristics*

Variable	Migrant		Local urban residents		Mean difference
	Obs.	Mean	Obs.	Mean	(*t*-value)
Number of family members	4432	1.76	4547	2.93	56.56
Per capita income	4401	17367.91	4547	20460.26	8.77
Per capita consumption	4401	8333.29	4547	10447.66	13.97
Age of the head	4401	30.93	4547	48.98	74.43
Years of education of the head	4401	9.33	4547	11.22	27.94
Health condition of the head	4401	0.85	4547	0.62	−25.39
Contract	4401	0.41	4547	0.49	7.92
Parentrural	4397	0.82	4540	0.12	−91.86

Variables	Definitions
Number of family members	Number of permanent residents of the household surveyed (family members of migrant households who do not live in urban areas are not included)
Per capita income	Household income/number of family members
Per capita consumption	Household consumption/number of family members
Household income	Household aggregate yearly income
Household consumption	For urban households: Aggregate consumption = Food + Clothing + Equipment + Medicine and Health + Communication + Education and culture; For migrant households: Aggregate consumption = Food + Clothing + Durable purchases + Daily necessities + Medicine and Health + Communication + Education and Culture
Health condition of the head	1 if household head reported "very good" or "good" when asked about his or her health status; 0 otherwise.
Contract	1 if household head was employed with a fixed employment contact (固定工) or a long-term employment contract (长期合同工, usually means longer than one year); 0 otherwise
Parentrural	1 if any one of the household head's or spouse's parents are living in a rural area; 0 otherwise

Note: We have removed observations with outlier values for some variables, for example, observations with zero household consumption and income, and with the head of the family being older than 80 or younger than 20. In total, 88 observations were excluded.

that, on average, local urban residents have a higher level of per capita income and per capita consumption, whereas migrant households have a smaller family size in urban areas.[8] The average per capita consumption of local urban residents is about 20% higher than that of migrants. Moreover, the heads of migrant households are younger and have a lower level of education, but their health conditions are better than the heads of local urban households.

If a local urban *Hukou* is randomly assigned to sample households, the analysis would be straightforward. We could simply focus on the consumption behavior of migrants and local urban households; the differences between the two groups can be attributed to the effects of *Hukou*. Although one can argue that the *Hukou* status is quite exogenous because it was determined upon the birth of an individual and is quite hard to change later, the identification of *Hukou*'s effect is complicated by concerns over the endogenous self-selection of rural people's migration decision. For example, as suggested by the statistics in Table 2, young individuals are more likely to leave their home and go to work in urban areas.

To mitigate the concerns on the potential self-selection issues, we use the propensity score matching method (see Rosenbaum & Rubin, 1985). We discuss here the intuition and the main results of the matching procedure, relegating more details to Appendix A. The matching begins by first estimating a probit regression on the dummy *Migrant*. In this probit regression, we use four control variables. The first is *Parentrural,* which equals 1 if any one of the household head's or spouse's parents is living in rural areas. As *Hukou* status is largely inherited from the parents, the *Hukou* status of their parents is the primary determinant for the status of sample individuals, which is confirmed by the correlation of *Parentrural* with *Migrant* being as high as 70%. The second control

variable is per capita income. There are opportunities for a migrant to obtain a local urban *Hukou*, mainly through obtaining higher education degrees, securing a job position with a high salary, or (in some cities and in some periods) purchasing high-valued real estate. Per capita income is used to capture the chances of obtaining a local urban *Hukou* through those channels. The third variable is the age of the head, which is the aspect in which the sample migrants group and sample local urban residents group differ the most on (as indicated by the t-value in Table 2) except for *Parentrural*. Last, we control a set of industry dummies to capture the occupational differences of the two groups. Because of the discriminations of China's labor market, migrants' appearance in certain industries, such as construction, is much higher than local urban residents.[9]

The results of the probit regression are reported in Table 9 in the Appendix. As expected, *Parentrural* has a very strong explanatory power in the regression. If *Parentrural* takes the value of 1, the marginal probability of a sample household being a migrant household is 52% higher. Second, per capita income and the age of the head are both highly and negatively significant in predicting the local urban *Hukou* status, which indicates that it is more likely for young and wealthy rural individuals to obtain a local urban *Hukou.* Together with the set of industry dummies, the control variables have strong predicting power on the dependent variable of *Migrant*, as the pseduo *R*-square is 63%.

The probit regression generates a propensity score for each household. Based on the scores, a migrant household is matched with a local urban resident household. The result of the matching procedure is two samples that correspond to the two original groups. Across the observable characteristics that are controlled in the probit regression, the two samples are statistically indistinguishable. That means, matched pairs

Table 3. *Baseline Results*

Variables	(1) Whole sample	(2) Matched sample	(3) Whole sample	(4) Matched sample
	Log(per capita consumption)		Household consumption/household income	
Migrant	−0.203***	−0.161***	−0.085***	−0.067***
	(0.018)	(0.025)	(0.007)	(0.010)
Log (per capita income)	0.575***	0.601***	−0.153***	−0.136***
	(0.009)	(0.014)	(0.004)	(0.006)
Age of the head	−0.002***	−0.005***	−0.001***	−0.002***
	(0.001)	(0.001)	(0.0002)	(0.0003)
Years of education of the head	0.008***	0.011***	0.002***	0.004***
	(0.002)	(0.003)	(0.001)	(0.001)
Number of family members	−0.045***	−0.023***	−0.015***	−0.004
	(0.006)	(0.008)	(0.002)	(0.003)
Contract dummies	Yes	Yes	Yes	Yes
Industry and ownership dummies	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes
Total number of observations	8,968	5,133	8,526	4,889
Number of local urban resident households	4,547	716	4,310	677
Number of migrant households	4,421	4,417	4,216	4,212
R-squared	0.471	0.403	0.207	0.155

Notes: The figures in brackets are robust standard errors; *, **, and *** indicate the significance levels at 10%, 5%, and 1%, respectively.

have a very close probability of receiving the treatment, but one of them received the treatment and the other did not. In this sense, the procedure creates a pseudo random sample in which households are randomly allocated to both the treatment and control groups (Heckman & Navarro-Lozano, 2004), such that any resulting differences between the two groups should reflect the treatment effect and not pre-existing individual characteristics.

4. BASELINE EMPIRICAL RESULTS

This section examines the differences between the consumption behavior of migrants and local urban residents. Table 3 reports the baseline results. First, column (1) presents the results in the entire sample. It shows that migrants' consumption is 20.3% lower than local urban households, when other major household characteristics are controlled. Then, column (2) presents the results in the matched sample. The estimated gap in consumptions of the two groups is 16.1%, which is quite close to the results from the whole sample. Notice that the number of local urban resident households in the whole sample regression is 4,547, whereas in the matched sample regression is 716. The close results from the two sets of regressions suggest that, although the concerns over self-selection bias are entirely justifiable, they may not have a strong impact on the consumption heterogeneity that this paper is interested in. On other major control variables, the whole sample regressions and the matched sample regressions also present similar and expected results. We regard this set of regressions as the baseline regressions.

Next, instead of the absolute standard of consumption, we examine the relative standard of consumption. Columns (3) and (4) report the results using the share of consumption in total household income as the dependent variables. They show that the consumption ratio of migrants is lower by 6.7–8.5%. These results also indicate that if, similar to Chamon and Prasad (2010), we define the savings ratio as 1—(household consumption/household income), migrants have a higher

savings ratio by 6.7% to 8.5%. Note that when we change absolute standard to relative standard of consumption as the dependent variables, the sign of logarithm (per capita income) turns from positive to negative. This result is consistent with Engel's Law, that is, as income rises, the proportion of income spent on consumption falls.

We also take into account the remittance because migrants probably send part of their income back to rural areas.[10] The methods we use and the results are reported in part A2 in the Appendix, where we still find a consumption gap of 8.7–10.8%. Finally, results of the baseline regressions only show the mean differences of consumption between local urban residents and migrants. To check whether the results are driven by a particular subsample, we first ran quantile regressions on the 25th, 50th, and 75th percentiles. The results are reported in Table 4. Then, based on the same model specification, we plot the consumption difference curve using 19 points of quantile regression, which are reported in Figure 2. Regardless of using the whole sample or the matched sample, we find the consumption gaps are significant on all percentile levels. More important, we find the gap is larger on lower levels, indicating that *Hukou* restrictions on consumptions are more pronounced on migrants at lower consumption levels.

5. DISCUSSIONS ON CHANNELS

In the latter part of Section 2, we propose several channels through which *Hukou* constraints reduce the consumption of migrants in comparison with local urban residents. Because of the limits of the data available, these hypotheses cannot be fully tested. Nevertheless, in this section, we provide some evidence for these hypotheses.

(a) *Channel one: precautionary saving*

Migrants are not covered to the same extent by the social safety net and their jobs are less secure; as a result, they have

Table 4. *Results of quantile regressions*

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Whole sample			Matched sample		
	25th percentile	50th percentile	75th percentile	25th percentile	50th percentile	75th percentile
Migrant	−0.234***	−0.159***	−0.138***	−0.228***	−0.119***	−0.110***
	(0.021)	(0.022)	(0.018)	(0.035)	(0.022)	(0.025)
Log (per capita income)	0.549***	0.619***	0.660***	0.586***	0.641***	0.685***
	(0.012)	(0.012)	(0.010)	(0.021)	(0.013)	(0.014)
Age of the head	−0.002***	−0.002**	−0.001**	−0.005***	−0.004***	−0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Years of education of the head	0.008***	0.004*	0.006***	0.010**	0.009***	0.009***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)
Number of family members	−0.050***	−0.039***	−0.027***	−0.033***	−0.017**	−0.011
	(0.007)	(0.007)	(0.006)	(0.012)	(0.007)	(0.008)
Contract dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry and ownership dummies	Yes	Yes	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Total number of observations	8,968	8,968	8,968	5,133	5,133	5,133
Number of local urban resident households	4,547	4,547	4,547	716	716	716
Number of migrant households	4,421	4,421	4,421	4,417	4,417	4,417
R-squared	0.284	0.312	0.336	0.242	0.274	0.300

Notes: The figures in brackets are robust standard errors; *, **, and *** indicate the significance levels at 10%, 5%, and 1%, respectively.
Empirical settings of regressions in this table are the same with columns (1) and (2) in Table 3.
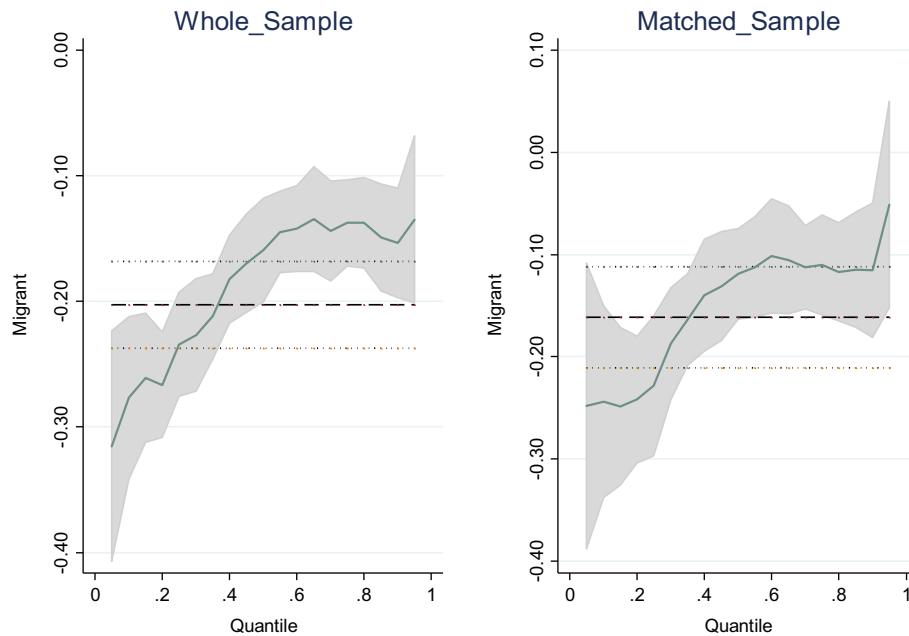

Figure 2. *quantile regression estimates. Notes: Confidence interval: 95%; Solid curve: Quantile regression estimates; Shaded area: confidence band; Dashed line: OLS estimates; Two dotted lines: Confidence intervals for the OLS estimates.*

a stronger precautionary saving motivation compared to local urban residents at a similar income level. Until now, there are no standard approaches to precisely measure precautionary savings. Thus, we first present statistics on simple savings ratios. In our sample, the average savings ratio of migrants is 51.3%, whereas that of local urban residents is 45.4%. Also, as we mentioned in the last section, the estimated gap of savings ratio by regression analyses is between 6.7% and 8.5%. In the following, we further present several sets of statistics on insurance coverage and job security.

First, restricted by the *Hukou* system, migrants are less likely to be covered by insurance programs. In our sample, only 940 heads of migrant households out of 4,421 (21.3%) are covered by a pension system. In addition, 2,623 (59.33%) are covered by a medical insurance program and only 573 (13.0%) by an unemployment insurance program.[11] In contrast, in the sample of local urban residents, 3,417 heads of household out of 4,547 (75.2%) are covered by a medical insurance program; the coverage ratio is much higher than that of the migrants (59.3%). The coverage ratio

Table 5. *Labor risk of local urban residents and migrants*

Job and contract	Migrants (%)	Local urban residents (%)
Whole sample		
Fixed or long-term contract	40.26	48.10
Short-term contract (duration < 1 year)	8.89	2.82
Temporary and without a contract	25.09	4.61
Individual business	21.97	4.72
Other	3.79	39.75
Matched sample		
Fixed or long-term contract	40.32	66.11
Short-term contract (duration < 1 year)	8.92	4.31
Temporary and without a contract	25.12	7.08
Individual business	21.97	10.83
Other	3.67	11.67

of pension systems and unemployment insurance programs was not available in the urban survey, so we cannot make the comparisons.

Second, migrant workers have a higher labor income risk. Table 5 presents the differences in contract structure of local urban residents and migrants. In the whole sample, 48.10% of local urban residents have long-term or fixed contracts with their employers; in contrast, only 40.26% of migrants have similar kinds of contracts. Moreover, 25.09% of migrants work in a temporary position without a written job contract, compared with 4.61% of local urban residents who do so; and 21.97% of migrants work on individual business, compared with 4.72% of local urban residents who do the same. The statistics from the matched sample shows even greater differences. For local urban residents in the matched sample, 66.11% have long-term or fixed contracts, while 40.32% of migrants have these kinds of contracts. These statistics are quite close to aggregate level numbers. For example, according to the report from NBS on migrants in 2013, even in 2012, only 43.9% of the employed migrant workers signed labor contracts with employers.

One indication of these differences of job contracts is that migrants are more likely to change jobs, which is indeed the case. The 2002 survey contains information on whether a person has recently changed jobs. It shows that 38.8% of migrants have changed jobs, while only 5.2% of local urban residents have done so. [12] What is worse, migrants have higher costs associated with changing jobs. For example, a recent survey in three Chinese cities, Beijing, Wuxi, and Zhuhai, shows that the institutional discrimination that is inherent in the *Hukou* system reduces the number of jobs available to migrants and increases their job search costs as well as the costs of losing jobs (Zhang, 2010). All of these statistics and facts strongly indicate that migrants face high levels of labor income uncertainty, which probably forces them to set aside more precautionary savings and, thereby, consume less.

Finally, migrants face a serious wage arrears problem. Regarding this issue, we cite here evidence provided by Friedman and Lee (2010):

> Less than half (48%) of the migrant workforce gets paid regularly, while 52% reported regular or occasional wage non-payment. Sixty-eight per cent of migrant workers work without any weekly day of rest; 54% of migrant workers have never been paid overtime wages as required by law and 76% do not receive the legal holiday overtime wages (p. 510).

These highly potential risks of wage arrears further enhance migrant workers' precautionary saving motivation.

(b) *Channel two: permanent income*

Channel two is related to the long-term permanent income that migrants expect to receive, which affects their current consumption decisions. Migrants have lower long-term income expectation because they are unlikely to stay permanently in the city where they are currently working. Yet, once they go back to rural areas, their income declines. According to Chen, Jiang, Lu, and Sato (2014), the probability of rural-to-urban migration rises then falls with age. The turning point of the inversed U shape is 33 years old. After that age, migrants are more likely to return to their homeland. Within this decade, China's urban income per capita is about three times that of rural residents. [13] So, migrants should expect to earn much less in their homeland than in cities.

However, similar to precautionary savings, permanent income is also hard to measure directly. Here, we lend some support to this channel by examining the effects of *Hukou* on consumption heterogeneity in different cities. Since this channel is originated in the restrictions of the city in allowing migrants to stay permanently, the more rigorous the restrictions, the stronger the effects of *Hukou* on migrants' permanent income expectation and, thereby, the stronger the effects of *Hukou* on current consumption.

Accordingly, we divided our sample into five groups: Shanghai, Chongqing, capital cities of coastal provinces, capital cities of noncoastal provinces, and noncapital cities of noncoastal provinces. In China, migrant workers have more difficulty in achieving urban *Hukou* in bigger or higher-level cities. Interested readers can refer to Appendix 1 in Wang (2004), where the "Principles of China's Control of Internal Migration" is summarized. Here, we quote from two paragraphs specifying "strict control" and "appropriate control," respectively:

> *Hukou* relocation from the rural to urban areas; or from other cities to Beijing, Shanghai, and Tianjin metropolises must be controlled *as restrictively as possible*; . . . *Hukou* relocation from township to city; from small city to large city; from ordinary village to outskirts of city/township, . . . should be controlled *appropriately* (p. 130).

Table 6 presents the results of these subsamples. Column (1) presents the results for Shanghai, where *Hukou* is restricted most rigorously. The consumption gap between migrants and local urban residents is 46.3%, which is much higher than the baseline results. Columns (2)–(5) present the results for other regions: for Chongqing, the gap is 26.2%; for capital cities of coastal provinces, it is 20.6%; for capital cities of noncoastal provinces, it is 6.05 (%); and for noncapital cities of noncoastal provinces, it is 11.3%. Regression results from the matched sample are very similar for the first three regions. But in the matched sample, the estimated consumption gaps are not significant in the later two regions, that is, cities of noncoastal provinces. The results suggest that the consumption heterogeneity mainly exists in coastal areas that have higher economic development levels. Moreover, these results support our expectation that the stricter the *Hukou* restriction of a city, the stronger the effects of *Hukou* on consumption heterogeneity.

Note that this set of results might also rule out the hypothesis of migration effects. It may be argued that migrants consume less simply because they have just migrated to cities and would not consume more even if they were given a local urban *Hukou*. If our baseline results are driven mainly by migration effects, consumption heterogeneities between local urban residents and migrants should be fairly consistent across different regions. Otherwise, if *Hukou* constraints constitute the dominant effect, consumption heterogeneity should be greater in

Table 6. *Consumption heterogeneity across different regions*

Variables	(1) Shanghai	(2) Chongqing	(3) Coastal provincial capital cities	(4) Noncoastal provincial capital cities	(5) Noncoastal and nonprovincial cities
Whole sample					
Log(per capita consumption)					
Migrant	−0.463***	−0.262***	−0.206***	−0.0605*	−0.113**
	(0.062)	(0.066)	(0.030)	(0.035)	(0.051)
Industry, ownership, and contract dummies	Yes	Yes	Yes	Yes	Yes
Total number of observations	889	728	2,848	2,564	1,151
Number of urban households	475	367	1,307	1,283	760
Number of migrant households	414	361	1,541	1,281	391
R-squared	0.537	0.438	0.388	0.385	0.490
Matched sample					
Log(per capita consumption)					
Migrant	−0.462***	−0.248***	−0.239***	0.0309	−0.0923
	(0.099)	(0.094)	(0.044)	(0.053)	(0.072)
Industry, ownership, and contract dummies	Yes	Yes	Yes	Yes	Yes
Total number of observations	468	410	1,788	1,463	523
Number of urban households	55	49	250	182	132
Number of migrant households	413	361	1,538	1,281	391
R-squared	0.494	0.440	0.330	0.353	0.425

Notes: The figures in brackets are robust standard errors; *, **, and *** indicate the significance levels at 10%, 5%, and 1%, respectively.
Four variables of Log (per capita income), age of the head, years of education of the head, and number of family members are controlled but not reported.

areas with stronger *Hukou* restrictions, which is the major finding of this set of results.

(c) *Durable goods*

Migrants have greater mobility, and therefore, they consume fewer durable goods, which are hard to carry when they move. To test this idea, in Table 7, we conduct the baseline regressions on the six subcategory consumptions, which aggregate to the total consumption. We do find that migrants consume approximately 20% less on household equipments, no

matter whether we use the whole sample or the matched sample. We also find that migrants consume more on communications, which could be caused by their depressed social status and discriminations they have encountered.

6. ROBUSTNESS CHECKS

The baseline regressions show that migrants' consumption is significantly lower than local urban residents. The phenomenal differences between migrants and local urban residents on age,

Table 7. *Consumption heterogeneity on subcategory consumptions*

Variables	(1) Food	(2) Clothing	(3) Household equipment	(4) Health and medicine	(5) Communication	(6) Education and culture
Whole sample						
Log(per capita consumption)						
Migrant	−0.136***	−0.0306	−0.209**	0.193**	0.144**	−0.044
	(0.041)	(0.058)	(0.091)	(0.095)	(0.061)	(0.100)
Industry and ownership dummies	Yes	Yes	Yes	Yes	Yes	Yes
Contract and province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Total number of observations	8,900	7,700	7,817	7,365	8,771	6,623
Number of local urban resident households	4,569	4,429	3,677	4,105	4,451	4,012
Number of migrant households	4,331	3,271	4,140	3,260	4,320	2,611
R-squared	0.358	0.350	0.184	0.159	0.338	0.259
Matched sample						
Log(per capita consumption)						
Migrant	−0.0700	−0.0110	−0.205*	0.107	0.201***	−0.00136
	(0.050)	(0.064)	(0.106)	(0.110)	(0.069)	(0.114)
Industry and ownership dummies	Yes	Yes	Yes	Yes	Yes	Yes
Contract and province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Total number of observations	5,042	3,963	4,710	3,890	5,011	3,274
Number of local urban resident households	716	697	574	634	696	667
Number of migrant households	4,326	3,266	4,136	3,256	4,315	2,607
R-squared	0.332	0.335	0.171	0.094	0.276	0.198

Notes: The figures in brackets are robust standard errors; *, **, and *** indicate the significance levels at 10%, 5%, and 1%, respectively.
Four variables of Log (per capita income), age of the head, years of education of the head, and number of family members are controlled but not reported.

income, and industry have been at least partly taken into account by the matching procedure. Despite this, the two groups are significantly different on some other aspects. We do not include more dimensions into the matching procedure because of the representativeness of the matched sample. Our current matching method keeps about one-sixth of the whole urban household sample in the data, which have already affected the representativeness of the urban sample and, consequently, the main results. If we include more dimensions in the first-stage of the matching procedure, we would get an even smaller sample of local urban residents. For this reason, we present both the whole sample results and the matched sample results for each of the previous tests, highlighting the similarity of the two sets of results. Nevertheless, we still keep in mind the differences of the two groups on other aspects. In this section, we try to rule out some competing hypotheses on the baseline results.

First, one may worry that the consumption heterogeneity between local urban households and migrants who were mainly born in rural areas could be because of some unobservable factors, such as culture, social norms, or habits, rather than *Hukou* identity. Existing studies have shown that culture and habits can affect household consumption and saving behavior (e.g., Carroll, Rhee, & Rhee, 1994; Carroll, Rhee,

& Rhee, 1999). So, it is possible that migrants have a lower consumption ratio than local urban residents simply because their habits or preferences are different.

Culture and social norms are not directly observable. Yet, in the CHIP urban survey, members of households are asked whether they were born in an urban or rural area but later obtained an urban *Hukou*. This information provides us a good opportunity to separate the effects of culture and *Hukou*. If culture or social norms are important, we should expect that people born in rural areas (including both migrants and local urban households born in rural areas) have similar consumption patterns.

In regressions in this section, we exclude the 106 nonlocal urban residents from the migrant sample. As we mentioned in Section 3(a), we first replicate the baseline regressions with the migrants group only consisting of rural–urban migrants. The results are reported in column (1) of Table 8. Compared with column (1) of Table 3, in Table 8 the number of local urban residents is the same (4,547), yet the number of migrants is 4,315, short by 106. The estimated consumption gap is 22.5%, which is larger than the estimated gap in baseline regression (20.3%). In the matched sample, the estimated gap is also enlarged with nonlocal residents being excluded.

Table 8. *Consumption heterogeneity and culture effects*

Variables	(1)	(2)	(3)	(4)
Whole sample				
Log(per capita consumption)				
Migrant	−0.225***	−0.230***	−0.258***	−0.312***
	(0.018)	(0.031)	(0.043)	(0.049)
Log (per capita income)	0.575***	0.611***	0.620***	0.603***
	(0.010)	(0.014)	(0.016)	(0.016)
Age of the head	−0.002***	−0.005***	−0.005***	−0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Years of education of the head	0.008***	0.007**	0.011***	0.012***
	(0.002)	(0.003)	(0.003)	(0.003)
Number of family members	−0.049***	−0.026***	−0.021**	−0.021**
	(0.006)	(0.008)	(0.009)	(0.009)
Industry, ownership, contract, and province dummies	Yes	Yes	Yes	Yes
Total number of observations	8,862	5,193	4,654	4,552
Number of local urban resident households	4,547	878	339	237
Number of migrant households	4,315	4,315	4,315	4,315
R-squared	0.472	0.413	0.388	0.383
Matched sample				
Log(per capita consumption)				
Migrant	−0.199***	−0.216***	−0.192***	−0.209**
	(0.027)	(0.042)	(0.070)	(0.098)
Log (per capita income)	0.599***	0.603***	0.599***	0.594***
	(0.015)	(0.016)	(0.017)	(0.017)
Age of the head	−0.005***	−0.006***	−0.006***	−0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Years of education of the head	0.012***	0.012***	0.012***	0.013***
	(0.003)	(0.003)	(0.003)	(0.003)
Number of family members	−0.029***	−0.026***	−0.025***	−0.026***
	(0.009)	(0.009)	(0.010)	(0.010)
Industry, ownership, contract, and province dummies	Yes	Yes	Yes	Yes
Total number of observations	4,966	4,498	4,364	4,338
Number of local urban resident households	655	187	53	27
Number of migrant households	4,311	4,311	4,311	4,311
R-squared	0.399	0.381	0.370	0.367

Notes: In this table, migrants group includes only rural–urban migrants or excludes the 106 nonlocal urban residents. Column (1) replicates the baseline regressions as those in column (1) of Table 3. Column (2) compares migrants with local urban residents who were born in a rural area; column (3) compares migrants with local urban residents who were born in rural areas and did not receive high-school education or above; column (4) compares migrants with local urban residents who were born in rural areas and later obtained an urban *Hukou* by joining the army or by having their land expropriated by the government.

Next, column (2) of Table 8 compares the consumption of 4,315 rural–urban migrants with 878 local urban residents who were born in rural areas but later obtained an urban *Hukou*. The results show that rural–urban migrants consume less by 23.0%, if we use the whole sample, and by 21.6%, if using the matched sample. These results indicate that the majority of the gap in consumption is not explained by culture or habits.

One may still argue that people who were born in rural areas but finally achieved an urban *Hukou* are different in terms of certain unobservable characteristics from those who did not get a *Hukou*. For this reason, we needed to explore how people born in rural areas achieved their urban *Hukou*. In China, most rural people obtain an urban *Hukou* through achieving a degree in an institution of higher education, purchasing a house, working as a civil servant, joining the army, or having their land expropriated by the government.[14] If well-educated people are more likely to get an urban *Hukou*, education could be an underlying force driving the difference in consumption behavior. For this reason, in column (3) of Table 8,[15] we used the subsample of local urban residents with nine years of education or less, which means that they received no more than compulsory education. The results show that, for local urban residents who were born in rural areas and did not receive a high school education or above, their level of consumption was still much higher than that of rural–urban migrants. The gap is 25.8% in the whole sample regression and 19.2% in the matched sample regression.

In column (4) of Table 8, we used the subsample of local urban residents who obtained their *Hukou* through joining the army or having their land expropriated by the government. These are more exogenous events, and the people involved are less likely to be systematically different from other migrants in terms of ability, talent, or preference. The results in column (4) show that the level of consumption of these people is 31.2% higher than that of migrants if we use the whole sample and 20.9% if using the matched sample.

Finally, one might argue that local urban residents who were born in rural areas have experienced longer urbanization process and are learning to consume. If this is the case, we should observe a positive relationship between the length of stay in cities and consumption of these people. The CHIP 2007 survey does not contain information regarding the length of stay in cities, but the CHIP 2002 does. Using the data, we find no significant relationships between the length of stay in cities and consumption of urban residents who were born in rural areas. Neither have we found significant effects of age on these people's consumption. Interested readers are welcome to check Table 8 in a previous version of this paper for added information.[16] In brief, we have not found evidence suggesting that the gap of consumption can be explained by habit, preference, ability, or other unobservable characteristics.

7. CONCLUSIONS AND POLICY IMPLICATIONS

This paper finds evidence that suggests that, without a local urban *Hukou*, migrants save more for precautionary purposes, have lower expectation of permanent income, and consume much less durable goods because of high mobility. We also find the *Hukou* restriction effects are more pronounced on migrants at low consumption levels.

In the past decade, the total number of migrants has been increasing rapidly. According to the estimation of Chan (2012), nationwide in 1995, there were only 70 million migrants. In 2012, the latest report released by NBS shows that the total number reaches 262 million, which accounts for almost one-fifth of China's whole population.[17] With the migrant group growing so fast, the aggregate effects of *Hukou* constraint on China's household consumption are strengthening. As such, *Hukou* is an important force driving down China's consumption-to-GDP ratio.

After the financial crisis occurred in 2008, the Chinese government has been trying various policies to raise household consumption and to rebalance China's economy. Major findings of this paper suggest that, if the *Hukou* constraints can be loosened, household consumption of migrants can be significantly boosted. More specifically, based on our findings in the channel section, we propose two steps of *Hukou* reforms. First, public services should be equalized between migrants and local urban residents, in particular the coverage of social security and various insurance programs. Moreover, efforts should be made to prohibit all kinds of discriminations against migrants on the labor market. These reforms are expected to reduce migrants' precautionary savings caused by lack of insurance coverage and by high-labor income risk. Second, the threshold for *Hukou* attainment should be gradually lowered so that migrants would have a higher expectation of staying in the city permanently and, consequently, have a higher permanent income expectation. For this purpose, the policymaker can adjust the current registration policies by making it more likely for those migrants with stable employment, stable residence, and constant social security participation to become a local city resident. In large cities where the current *Hukou* restrictions are especially strict, a residence card can be given to selected migrants, which allows them to legally stay in the city for 5–10 years. Such policies can reduce migrants' mobility and encourage them to consume more durable goods.

NOTES

1. For a detailed introduction to local *Hukou*, please refer to the section titled, "The *Hukou* Dual Classification" in Chan and Buckingham (2008).

2. For example, in 2011, the proportion of people living in urban areas in the whole population was 51%, while the remaining 49% were people living in rural areas. Sources of data: *China Statistical Yearbook 2012*.

3. Sources of data: *China Statistical Yearbook 2012*.

4. Actually, migrants in China are commonly called "population movement" or "floating population," which implies a much lower degree of expected permanence (Chan & Buckingham, 2008).

5. As far as we have learned, the sampling of migrant households involves several steps: (1) each city was divided into blocks each one square kilometer; (2) about 20 blocks were selected in one city; (3) the survey team documented all of the establishments (and migrants) in the selected blocks; (4) from the whole sample of establishments in a block, a number of establishments were randomly drawn; and (5) the survey team visited the selected establishments, further drawing migrants for the survey.

6. NBS has released a series of annual reports on migrant workers based on large-scale samples since 2009, so the 2009 report is the earliest one available.

7. Djajić and Vinogradova (2014) also suggest that migrants' housing investment choices are quite different from local residents, which causes differences in their saving behaviors.

8. In the survey, family members of migrant households who do not live in urban areas are not included in calculating the family size. Typically, family size of migrant households is larger than that of the urban households if all family members are included.

9. There are of course more factors that determine rural people's migrant decisions. For example, Mullan, Grosjean, and Kontoleon (2010) show that tenure insecurity and restrictions on land rentals reduces migration.

10. It is widely observed in developing countries that temporary migrants tend to send remittances home for house construction and other purposes (Djajić & Vinogradova, 2014).

11. Related to these statistics, in 2012, according to National Bureau of Statistics (NBS) (2012), only 14.3%, 24%, 16.9%, and 8.4%, respectively, of the employed migrant workers (exclusive of those self-employed) were covered by pension, employment injury insurance, medical care, and unemployment insurance.

12. In the 2007 CHIP data, 10.74% of urban residents have recently changed jobs. Yet there is no such information for migrants.

13. See the 2013 annual statistical report released by NBS at http://www.stats.gov.cn/tjsj/zxfb/201402/t20140224_514970.html.

14. For a detailed introduction, please refer to Chan and Buckingham (2008), section titled "The System of Approving *Hukou* Migration and the Nongzhuanfei Reforms."

15. We used a threshold of nine years of education because China requires everyone to attend school for at least nine years, which implies that people with less than or equal to nine years of education are less likely to be systematically different in terms of their ability, talent, or preference, regardless of whether they obtained urban *Hukou*.

16. The paper is available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1989257.

17. Please refer to http://finance.people.com.cn/n/2013/0527/c1004-21624982.html for the number of migrant workers.

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APPENDIX

A. *The matching process*

We perform a match on the treated group of migrants who do not own an urban *Hukou* with local urban residents. As introduced in Section 3(c) in the main text, we use four variables to predict the probability of a sample individual to be in the group of migrants. Table 9 presents the results of the probit regression, which is used to predict the probabilities (i.e., propensity scores). *Parentrural*, per capita income, and age of the head are all highly significant with the expected signs in the regressions. We provide explanations on these results in Section 3(c). We also control a set of industry dummies in this regression.

Using the propensity scores from this regression, we then do the propensity matching by employing the method of k-nearest neighbors with the caliper of 1% (using the command of "psmatch2" in Stata). A caliper is the distance between the predicted probabilities of receiving the treatment between matched observations. This procedure generates 720 observations in the local urban resident group and 4,472 observations in the migrant group. We did not use the one-to-one matching, so one untreated group individual could be matched with several treated group individuals. This helps avoid losing too many observations so that the results are no longer representative. The choice of matching procedures always involves a trade-off between identifying the treatment effects and generalizing the results to the full population. Accordingly, we keep several untreated group firms in a matched pair as long as their propensity score is within the restrictive caliper of 1%.

In Table 9, we conduct in the matched sample the same probit regression with that used in the matching procedure. Almost every previously significant coefficient experiences a sharp attenuation in magnitude and statistical significance. The Pseudo R-square is also significantly reduced from 63% to 22%. These results suggest that the matching procedure successfully homogenizes the groups on the observable characteristics that are controlled in the probit regression. Although the matched sample cannot be considered as randomly assigning an urban *Hukou* to sample households, it takes significant strides toward that ideal.

B. *Taking into account remittance*

The remittance, which is saved for the migrant's family in the urban area, is at least partly consumed by the family in the rural area. For this reason, in Table 10, we assume that the rural family has the same consumption-to-income ratio as the family members in urban areas. Therefore, we

Table 9. *Probit results (marginal effects reported)*

Variables	(1) Whole sample Migrant (dummy)	(2) Matched sample Migrant (dummy)
Parentrural	0.522***	0.188***
	(0.0132)	(0.0137)
Log(per capita income)	−0.0807***	−0.0187***
	(0.0133)	(0.0070)
Age of the head	−0.0193***	−0.0054***
	(0.0008)	(0.0004)
Industry dummies	Yes	Yes
Total number of observations	9,148	5,192
Number of migrant households	4,476	4,472
Number of local urban resident households	4,672	720
Pseudo R^2	0.63	0.22

Table 10. *Baseline regressions with adjusted remittance*

Variables	(1) Whole sample Log(per capita consumption + adjusted remittance)	(2) Matched sample
Migrant	−0.108***	−0.087***
	(0.019)	(0.028)
Log(per capita income)	0.578***	0.603***
	(0.010)	(0.016
Age of the head	−0.001**	−0.002***
	(0.001)	(0.001)
Years of education of the head	0.006***	0.007***
	(0.002)	(0.003)
Number of family members	−0.072***	−0.074***
	(0.006)	(0.009)
Industry and ownership dummies	Yes	Yes
Contract and province dummies	Yes	Yes
Total number of observations	8,948	5,113
Number of local urban resident households	4,547	716
Number of migrant households	4,401	4,397
R-squared	0.431	0.367

Notes: The figures in brackets are robust standard errors; *, **, and *** indicate the significance levels at 10%, 5%, and 1%, respectively.

multiplied the remittance by the consumption ratio, and then we added this adjusted remittance to the consumption of migrant households in urban areas. The method of adjusting the migrants' consumption is given by the following formula: household consumption_adjusted = household consumption + remittance*(household consumption/(household income − remittance)). Other empirical settings of regressions in Table 10 are the same with those in Table 3.