

Hukou Reforms in Chinese Cities, 1997-2010: Data and Facts*

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1 Introduction

Hukou, the household registration system in China, dates back to the 1950's. Back then, urban residents were subsidized with downward-distorted prices for agricultural products and enjoyed a much higher standard of living than rural residents, so there was a strong incentive for people to live in cities. The Hukou system was established to curb rural-urban migration and to increase the state's control over the economy.¹ Before the 1980's, people were tied to their place of registration and were not allowed to move to any other places without permission from the authority. In the era of a command economy, since most jobs were controlled by the state, foods rationed according to Hukou, the Hukou system could be strictly enforced. As a result, there were only minimum rural-urban or urban-urban migrant workers.

The boom in private economy in the 80's and 90's made enforcement difficult. People started to move to urban areas and other cities for job opportunities. Gradually, migration control policies had also become less stringent. For example, it was possible for migrants to apply for a temporary residence permit, and stayed outside their place of registration legally. But these changes did not make it significantly easier for migrants to obtain local

*This is a companion note to [Fan \(Forthcoming\)](#) and was part of my doctoral dissertation at the University of Maryland. Data described in this note can be accessed at the [AEJ: Macro](#) page. Please kindly cite [Fan \(Forthcoming\)](#) if the data is used. I am grateful to Virgiliu Midrigan, whose comments inspired this project. I thank Shing-Yi Wang for helpful discussion. I gratefully appreciate financial support from the Wiley Fellowship at University of Maryland, and the hospitality of Shanghai University of Finance and Economics and Tsinghua University during the data collection stage. All errors are my own.

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¹Many argue that these distortions served an industrialization strategy that prioritized manufacturing development and that the Hukou system was an integral part of this strategy that made transfers from agricultural to manufacturing sectors feasible (see, for example, [Chan and Zhang, 1999](#)).

Hukou, without which they were ineligible for many local public goods, such as health care, schooling, and social security. As a result, even though it was possible to find a job in the private sector, the Hukou system still imposed restrictions on migration. Given this background, reforms that lowered the difficulty of obtaining local Hukou for migrants still made a material difference for their quality of life and could have a first-order impact on migration decisions.

Beginning in the mid-1990's, Chinese cities gradually started to reform the Hukou system and allowed qualified people from the rural area and other cities to obtain local Hukou. Experimental in nature, these reforms were initially carried out in a very small number of cities. In 1997, the State Council and the Ministry of Public Security launched a large-scale experiment that relaxed the once-strict constraint imposed by the central government on provincial and local authorities in terms of what types of Hukou policies were allowed. Under this experiment, each province was allowed to (but did not have to) select up to 10-20 counties to experiment with slightly relaxed Hukou policies for 2 years.²

At the end of this "trial period", in 2001, the reform was scaled up to potentially all counties. Since the initial constraint on Hukou reforms mostly lied in the top authority, reforms were in the form of the central government gradually granting more decision rights to lower-level governments. Some freedom was given to provincial and local officials to decide how deep to go with the reform, but they were not allowed to cross the boundary set by the central government. The reforms were rolled out gradually and in different depths. The variation in timing and depth of reforms gives us a unique opportunity to examine how Hukou reforms affect labor mobility. This information can then be combined with structural estimation of migration costs to infer the component of mobility costs due to the Hukou system.

To this end, in this note, I first construct a dataset with prefecture-level information on Hukou policies following a narrative approach. Specifically, I collect and review all Hukou-related official news articles, and laws and regulations at the provincial- and prefecture-level from two comprehensive libraries of official news, and local laws and regulations, respectively. Based on a set of criteria described below, I rate each document describing Hukou policies into a score of 0 to 6, with 0 being the most stringent and 6 being completely open. I show that there is indeed variation in timing of reforms across cities.

Using the Hukou reform panel and a first-difference specification, I first document that a one-point increase in Hukou score decreases the share of local residents without Hukou by 16%. This result reassures us that the documented Hukou reforms indeed

²There are 34 provinces and around 2800 counties in China.

affect the probability of obtaining local Hukou. I then study the effect of Hukou reforms on migration. I find that a one-point increase in Hukou score increases 5-year inward migration by 18.6%. The effect on 1-year migration is about half this size, although it is less precisely estimated. There is an obvious endogeneity concern that Hukou reforms were more likely to be carried out in cities with a faster-growing local economy, cities with more resources to provide public goods, and cities with a better access to international markets, all of which also tended to be more attractive to migrants. I control for these factors directly and find that the results do not change much.³

The approach used in constructing the dataset builds on recent work, [Kinnan, Wang and Wang \(Forthcoming\)](#) and [Sun, Bai and Xie \(2011\)](#), both of which use a narrative approach to measure Hukou policies at the provincial level. They do so by simply counting the number of reforms taking place in a province over the sample period, without differentiating among reforms with different depths. Relative to existing work, my dataset contributes to the literature in that it is at the prefecture level, it covers a longer time period, and most importantly, it incorporates the depth of reforms. To my knowledge, it is also the first prefecture-level panel data of Hukou reforms and could be of use to other researchers interested in this topic. In addition, by estimating the effect of Hukou reforms on migration, this note also contributes to a question that is yet to be settled.⁴

2 Data

2.1 Rating Hukou Policies

The primary sources of information I use in constructing the data include one of the most comprehensive libraries on law and regulations, Peking University Law Information Database (<http://www.lawinfochina.com/>), and the webpage of the official news agency for the community party (<http://www.xinhuanet.com/>). I collect all official news, and laws and regulations potentially related to Hukou reforms on these two databases by searching the following set of keywords. First, any combinations of “hukou” or “huji” (also means Hukou) with “gaige” (reform) or “guanli” (management), which are the keywords used in [Kinnan, Wang and Wang \(Forthcoming\)](#). I supplement these keywords with the following words: “chengzhenhua”/“chengshihua” (both mean urbanization) and “lu-

³Of course, lacking an IV, there might still be other sources of endogeneity issues that I would not be able to control for.

⁴Using province-level Hukou reform information, [Sun, Bai and Xie \(2011\)](#) finds little impacts of Hukou reforms on migration. On the other hand, using province-level Hukou reform tally interacted with network effect between provincial pairs, [Kinnan, Wang and Wang \(Forthcoming\)](#) finds a strong effect of Hukou reforms on migration.

ohu”/“ruhu” (both mean granting Hukou to someone). These additional keywords expand the number of policy changes recorded by around 30%.

I review the Hukou-related documents from the keyword search and rate them on a scale of 0–6. A 0 means strict control on Hukou, with virtually no room for mechanical growth (new Hukou to migrants), while a 6 means an open-door policy that grants Hukou to anyone with legal residence and employment in a city. The rating is done in the following way. First, I separate a policy in terms of its geographic coverage within a city. Some policies apply only to outside the central district of a city, while others apply to the central district as well, so I rate policies on two subscores based on their influence on the central districts and other parts of a city separately. Each subscore takes a value of 0–3. The reform index is the sum of the two subscores, so it takes a value of 0–6.

To evaluate each subscore, I focus on the policies that are relevant to a substantial part of population, so those applying only to advanced-degree holders with overseas experiences or high-tech entrepreneurs are excluded. Within the remaining policies, the details of qualification criteria differ, but most of the time, requirements are based on the following criteria: 1) a migrant’s job prospect and job stability, 2) his/her residential condition, and 3) his/her history of contribution to the local social security system. I give a value of 0 to cities that grant virtually no Hukou to migrants other than those initiated by public-sector employers. I give a value of 1, if a migrant can obtain Hukou by purchasing an apartment above certain size or value. I give a value of 2, if a migrant can obtain Hukou by purchasing an apartment (or renting a subsidized apartment from his/her employer), with no specific requirement on its values, or by working and contributing to the social security by more than 5 years. I give a value of 3, if a migrant can obtain Hukou by working and residing in a city and contributing to the local social security for a relatively short period of time.

Importantly, in Chinese cities, the migration into the central districts are controlled much more strictly than into the outskirts. When I see a policy mentioning only relaxing Hukou restriction in its central district with no explicit statement on the policy for the other parts of the city, I take the stand that the policy implicitly applied to the entire city.

Other than excluding Hukou reforms that apply only to the most educated of all (such as people with a Ph.D. from an overseas institution), I do not differentiate Hukou reforms for skilled and unskilled workers. This simplification also helps reduce the number of discretionary decisions in scoring Hukou policies.

2.2 Descriptive Statistics

Table 1 summarizes the time dimension of Hukou reforms. As Column 1 shows, the average reform index across cities is virtually 0 in 1997. It increases gradually over time and reaches 3.31 in 2010. The cross-sectional standard deviation of the index starts small—as most cities controlled Hukou strictly in the beginning of the sample period—and eventually converges to around 1.3.

The third column reports the number of cities that actually experience a change in the reform index in a given year. In most years, 15–50 cities experience a change in the index. In 2001, however, two-thirds of cities relaxed their Hukou restriction. This is consistent with the switch from experimentation in selected towns within a province to a comprehensive reform in 2001.

Table 1: Summary Statistics of Hukou Reforms

Reform Index			
Year	Mean	Standard deviation	No. of reforms
1997	0.01	0.15	
1998	0.11	0.52	14
1999	0.63	1.14	73
2000	0.91	1.19	60
2001	1.67	0.9	236
2002	1.77	0.93	33
2003	2.04	1.12	41
2004	2.42	1.24	65
2005	2.46	1.23	12
2006	2.55	1.23	18
2007	2.74	1.27	44
2008	2.78	1.3	6
2009	3.15	1.34	51
2010	3.31	1.45	25

Table 1 shows large variation in changes to Hukou policies across cities. Indeed, official statements frequently stated the requirement that Hukou policies should depend on the development stage of a city. In the early stage of the reform, the concern seemed to be that cities might not be able to provide enough job to all migrants, so more developed cities were encouraged to be more open. In the late 2000's, however, the concern became congestion and pollution in the largest cities. Policy statements from this period emphasized controlling the size of large cities and encouraging more people to move to small cities.

This change in attitude is visible from the dataset. In Figure 1, I plot the average scores

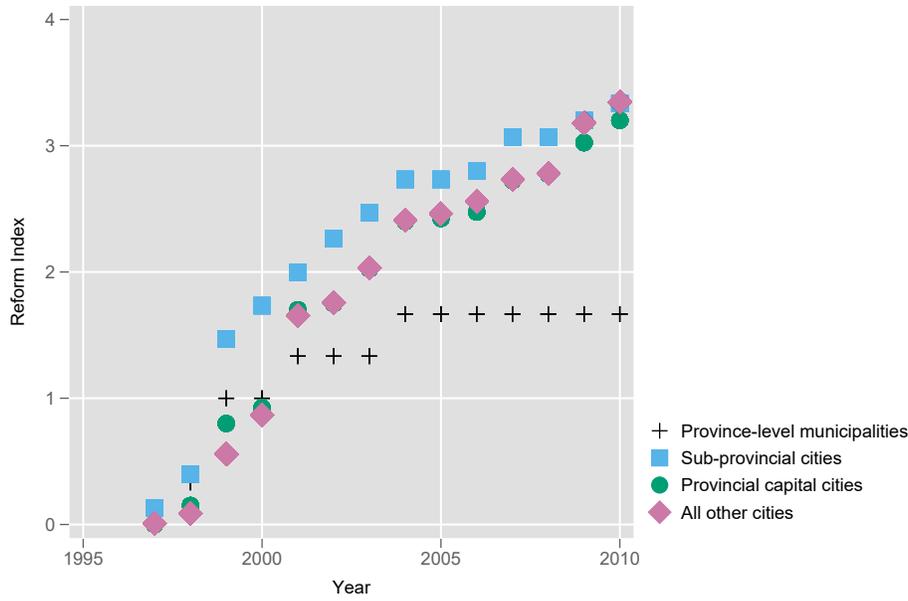


Figure 1: Hukou Reform in Different Types of Cities

for four different types of Chinese cities. The province-level municipalities—Beijing, Shanghai, Tianjin, and Chongqing—have the same status as a province in China’s political hierarchy. They are also among the largest cities in China, so they are the first tier. One tier below are the sub-provincial cities, many of which are provincial capitals, which also tend to be the most economically vibrant cities in China. Further below are the remaining provincial capitals, and finally all other cities. Figure 1 shows that the provincial municipalities and sub-provincial cities were more open than other cities at the beginning of the sample period. But other cities started to catch up. After 2001, Hukou policies in provincial-level municipalities became more restricted than other cities. By the end of the sample period, the sub-provincial cities were also slightly less open than other cities.

I merge the Hukou reform panel data with information from the 2000 and 2010 population censuses, the 2005 population mini-census, and other city characteristics from various statistical yearbooks. Because the population and mini-censuses are only available for these three years, I take the average of the Hukou openness score over the following three intervals: 1997-2000 (period 1), 2001-2005 (period 2), and 2006-2010 (period 3).

I first analyze the determinants of reforms using a regression framework. Table 2 reports the results in which the Hukou reform index is the dependent variable. In the first column, I include only provincial fixed effects. These fixed effects alone explain about 24% of the variation in the reform index. In the second column, I include time dummies for the three time periods. Consistent with the gradual opening up, the time fixed effects

Table 2: Determinants of Hukou Reforms

	(1)	(2)	(3)	(4)
		Hukou Reform Index		
Period=2		1.654*** (0.042)	1.659*** (0.045)	1.684*** (0.047)
Period=3		2.489*** (0.054)	2.493*** (0.057)	2.543*** (0.064)
city level=1 × trend				-0.086 (0.087)
city level=2 × trend				-0.192* (0.105)
city level=3 × trend				-0.730*** (0.185)
Constant	1.667*** (0.276)	0.286 (0.359)	-0.467 (0.658)	0.967** (0.506)
City Fixed Effects			yes	yes
Provincial Fixed Effects	yes	yes		
Observations	1019	1019	1019	1019
R ²	0.239	0.792	0.850	0.852

Notes: *city level* indicates the administrative level of a city, with 3 being the highest (“provincial-level municipalities”), and 0 being the lowest (“all other cities” in Figure 1). Reform index is averaged over the following interval: 1997-2000 (period 1), 2001-2005 (period 2), and 2006-2010 (period 3).

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

tend to increase over time. Together, provincial and time fixed effects account for around 80% of the variation in the reform index. This reflects the fact that policy changes tend to be correlated across cities within a province. The third column adds city fixed effects. The R squared increases further to 85%. In the fourth column, I add the interaction between the administrative level of a city and the time trend. The administrative level of a city ranges from 0 to 3, with the highest value representing provincial-level municipalities, and the lowest corresponding to cities that are not provincial capitals (“all other cities in Figure 1”). Consistent with the previous narrative, the regression indicates that more important cities became relatively more closed to migrants over time.

The discussion so far indicates that the speed and depth of Hukou reforms depend on a city’s economic and political status. Given this, in estimating the effect of Hukou policy on migration I will control for potential confounding factors.

3 The Effect of Hukou Reforms on Migration

I estimate the effect of Hukou reforms carried out in the sample period on labor mobility. I focus on two outcome variables: the share of residents with local Hukou, which measures the difficulty of obtaining local Hukou, and the number of migrants in a city, which measures workers' migration decisions in response to Hukou reforms. Because I do not differentiate Hukou policies by workers' skill, in these regressions, I will not separate skilled and unskilled workers either.

To isolate the policy changes from time-invariant unobserved regional heterogeneity that can affect migration decisions, I use the following first-difference specification:

$$\Delta y_{i,t} = \beta_1 p_t + \beta_2 c_i + \beta_3 \Delta x_{i,t} + \epsilon_{i,t}. \quad (1)$$

In the specification, $\Delta y_{i,t}$, is the change in an outcome variable of city i between two consecutive periods, $t-1$ and t . p_t are the time period fixed effects. To capture differential trends by city types, I include city administrative level fixed effects, c_i . $\Delta x_{i,t}$ captures contemporaneous changes in the economic environment in city i , which include variables that affect both migration and Hukou policies, such as per-capita income, population, local public good provision. I will also control for a region's distance to the coast so that we do not attribute the differential trends between coastal and interior regions to Hukou reforms.

Table 3 reports the effect of Hukou reforms on the share of residents with local Hukou. There are three snapshots for this outcome variable (2000, 2005, 2010), so we have a two-period panel for specification 1. In the first column, only the reform index and time fixed effects are included. The coefficient for the change in the Hukou reform index is statistically significant. The point estimate is 1.1 percentage point. To put this number into perspective, at the time of 2000, the average share of residents in a city without a local Hukou is 6%. A one-point increase in the Hukou reform index therefore decreases the share of residents without local Hukou by 16%. The second column adds city administrative level indicators to allow for differential trends by city types. The coefficients for these indicators suggest that larger and more important cities became stricter over time in granting residents local Hukou. The inclusion of these variables, however, does not affect the magnitude and significance of the coefficient for Hukou reforms. To further capture the differential trends among cities, the third column adds changes in per-capita GDP, population, a proxy for local public good—the teacher-to-student ratio in local public primary schools—and the distance of a region to the coast. Reassuringly, none of these variables have a significant impact. Moreover, the coefficient for the Hukou reform index

barely changes.

Table 3: The Effect of Hukou Reform on Access to Local Hukou

	(1)	(2)	(3)
	Δ Share of Residents with Local Hukou		
Δ Hukou Reform Index	0.011*** (0.004)	0.008** (0.004)	0.010*** (0.004)
time=3	0.070*** (0.007)	0.068*** (0.007)	0.065*** (0.007)
city level=1		-0.021** (0.010)	-0.021** (0.010)
city level=2		-0.072*** (0.012)	-0.067*** (0.012)
city level=3		-0.122*** (0.029)	-0.113*** (0.027)
Δ log per capita GDP			0.000 (0.009)
Δ log population			-0.035 (0.028)
Δ TeacherStudentRatio			0.000 (0.001)
log(Distance to Port)			0.003 (0.005)
Constant	0.061*** (0.006)	0.070*** (0.006)	0.064*** (0.010)
Observations	679	679	624
R ²	0.152	0.207	0.211

Notes: see Table 2 for the definition of variables. *TeacherStudentRatio* is the teacher-to-student ratio in local public primary schools.

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3 provides a direct validation of the reform data by showing that the documented reforms indeed made it easier for migrants to obtain local Hukou. Did the better prospect of obtaining Hukou make a city more attractive to migrants? Table 4 reports the effect of Hukou reforms on inward migration. Columns 1-3 focus on log changes in the number of migrants that moved in during the past year, and Columns 4-6 focus on log changes in the number of migrants that moved in during the past five years. Such information is only available for 2000 and 2005, so after taking first difference, we have only one snapshot.⁵ Columns 1 and 4 include only the change in reform index as the in-

⁵I only have access to the county-level tabulations of the 2010 census, which do not include the number of 1- or 5-year migrants.

Table 4: The Effect of Hukou Reforms on Migration

	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta\text{Log}(\text{No. of migrants in the past year})$			$\Delta\text{Log}(\text{No. of migrants in the past 5 years})$		
$\Delta\text{Hukou Reform Index}$	0.161*	0.139	0.076	0.209***	0.206***	0.186***
	(0.097)	(0.098)	(0.097)	(0.072)	(0.072)	(0.071)
city level=1		-0.567***	-0.441**		-0.338**	-0.320**
		(0.205)	(0.205)		(0.146)	(0.131)
city level=2		-0.594***	-0.661**		-0.137	-0.184
		(0.152)	(0.300)		(0.162)	(0.141)
city level=3		-0.330**	-0.467		0.333***	0.204*
		(0.149)	(0.657)		(0.095)	(0.106)
$\Delta \log$ per capita GDP			-0.805***			-0.348
			(0.240)			(0.247)
$\Delta \log$ population			-0.009			0.460
			(0.363)			(0.279)
$\Delta \text{TeacherStudentRatio}$			-0.072*			-0.057*
			(0.039)			(0.030)
$\log(\text{Distance to Port})$			-0.496***			-0.370***
			(0.105)			(0.080)
Constant	-0.088	0.051	0.922***	-0.347***	-0.299**	0.128
	(0.180)	(0.190)	(0.249)	(0.133)	(0.141)	(0.214)
Observations	295	295	274	331	331	304
R ²	0.009	0.041	0.175	0.025	0.041	0.156

Notes: see Table 2 for the definition of variables. *TeacherStudentRatio* is the per-student number of teachers in local primary schools.

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

dependent variable. Coefficients in both columns are positive and statistically significant. According to the estimates, a one-point increase in the reform index increases one-year migration by 16% and five-year migration by 21%. To rule out differential trends, I gradually add city administrative-level fixed effects and additional control variables, including changes in per-capita GDP, population, the teacher-to-student ratio in local primary schools, and the distance between a region and the coast. After the inclusion of these variables, the coefficient of Hukou reform loses its significance in predicting one-year migration, although the point estimate remains positive and economically meaningful. On the other hand, the coefficient for five-year migration remains robust. According to the specification in Column 6, a one-point increase in the Hukou reform index increases five-year migration by 19%. The estimate here will be used in [Fan \(Forthcoming\)](#), to back out the implied change in migration costs from Hukou reforms.

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