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The Segmentation of Urban Housing and Labor Markets in China: The Case of Shanghai

Working Paper WP16CL1

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May 2016

Abstract

With rapid economic restructuring, large-scale population migration and market-oriented housing commercialization, China's urban residents have experienced increasing segregation of residential spaces. How such socio-spatial stratifications have impacted their jobs has significant policy implications and deserves a systematic investigation. Using the Sixth Census (2010) data with detailed geographic information for Shanghai, we examine the residential patterns of residents and particularly investigate how the patterns of local residents' residential clustering are different as compared to those of migrants. We find that rural migrants in Shanghai feature a much higher level of residential segregation as compared to urban locals and urban migrants, with considerable concentration in the outskirts of the city. Meanwhile, data suggests that rural migrants tend to cluster in low-skilled and low-paying jobs at the bottom hierarchy of the urban labor market. We then investigate how the neighborhood contexts are associated with individuals' employment outcomes. It shows that migrant enclave residence is associated with positive employment outcomes for rural migrants, indicating the strong social networks that exist in these neighborhoods. Nonetheless, the positive social network effect is not shared by urban migrants or urban natives. Several robustness checks have been implemented to safeguard these findings. Finally we discuss the policy implications of our findings and potential extension of this research in the future.

Keywords: residential segregation, labor market, spatial mismatch hypothesis, China

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Introduction

With the rapid urbanization in China since 2000, tens of millions of rural residents have migrated to the urban area and the residential segregation between local residents and rural migrant workers has become a notable issue in recent years (Fan et al. 2011; He 2013; Wu 2004; He and Wang 2016). Some have documented the residential segregation patterns of migrants in various Chinese cities, and the emergence of "urban villages" (chengzhongcun) in Beijing (Zheng et al. 2009), Guangzhou (Du and Li 2010) and Shanghai (Li et al. 2015). However, few studies have attempted to link the residential locations of migrants to their job outcomes.

Spatial Mismatch Hypothesis (SMH) proposes that difficulty in accessing suburbanized job opportunities, especially low-skilled jobs, is a major obstacle for inner city minorities which results in their high unemployment rate, long commutes, and low wages (Kain 1968; Ihlanfeldt and Sjoquist 1998). The conditions shaping such employment disadvantages include the suburbanization of job opportunities, restricted residential location choices of minority workers, and the limited access of public transportation (Joassart-Marcelli 2007). While this hypothesis originated from the U.S. context, Chinese cities might experience a similar pattern of housing and labor market segmentation in the current economic restructuring and spatial transformation. Dense social networks that exist in these immigrant enclaves might overcome physical barriers to job opportunities for migrant workers.

Like most cities in China, residents in Shanghai lived in public or public-subsidized housing that was organized by working unit (*dan wei*) from the 1950s to the 1980s. Housing privatization and the active real estate marketization since the 1990s have significantly transformed the socialist residential landscape characterized by homogeneous work-unit compounds surrounding old housing districts (Huang 2013). In this process, those who used to live in public housing had the privilege over non-residents to purchase the housing at a subsidized price, and most people indeed made the purchase and became homeowners. Those latecomers who used to be on the waiting list for public housing had to purchase housing from the private sector at much higher prices. Thus, access to public housing in the socialist era has actually led to current differentiation in homeownership and variation in housing conditions. The differentiation is further reinforced by economic gains from public housing when the housing prices have rocketed with marketization. In this sense, marketization of housing markets, reinforced by traditional hierarchical socialist housing-allocation systems, has significantly aggravated residential inequality in Chinese cities.

At the same time, Shanghai's state-sponsored redevelopments have facilitated the urban stratification process. These redevelopment schemes in the 1990s and the 2000s (such as the "365 scheme" and the "new round old urban area redevelopment scheme") were underwritten

by economic growth-oriented policies and government subsidies. The government mobilized the most important resources, such as urban land and resettlement houses, to tackle the problem of fragmented property rights. Thus, with the motivations behind revenue generation and city reimaging, the redevelopment programs transferred the old inner city neighborhoods, which used to accommodate low-income residents, to high-value-added commercial land that is occupied by people with high socioeconomic status. Unlike traditional Western cities, however, residential sorting has not led to a decayed inner city and wealthy suburbs. On the contrary, the state-sponsored redevelopment projects in Shanghai gentrified the inner city areas, while extensively displacing the low-income population into the urban fringe (He 2010; He and Wu 2007).

We use the sixth census microdata of the year 2010 for Shanghai, the largest city in China, to examine how the neighborhood-level residential segmentation affect labor market outcome for urban residents in the city. Particular attention is given to the impacts of residential segregation on urban migrant and rural migrant populations. Specifically, we attempt to answer the following three questions.

First, what is the latest trend of Shanghai's residential segregation across Hukou status? Previous literature has measured the degree of residential segregation in Shanghai in 2000 using the fifth census data (Li and Wu 2008), but little is known about how the residential segregation pattern in this city has evolved after China has both liberated its housing sector and Shanghai absorbed more than 9 million migrants since 2000. We are interested to know within this context whether the residential locations of rural migrant workers in urban China exhibit the same concentration patterns as other Western countries and if so, where are the areas that they likely concentrate in. With the detailed geographic information available in our census data, we are able to calculate Residential Concentration Quotient (RCQ) (Liu 2009) to generate the spatial pattern of housing segregation in Shanghai at street (*Jiedao*) level.

Second, how is Shanghai's urban labor market segmented across skills and Hukou status? Especially, we attempt to investigate what industries and occupations low-skilled workers and migrant workers tend to cluster in.

Last, but most importantly, how is residential segregation linked to labor market segmentation in Shanghai? Particularly, we examine to what extent residential location context matters in the labor market outcomes of migrant workers in terms of employment potential.

These questions have received much discussion in the U.S. context but have not been sufficiently addressed in the transforming urban realities of China. Through the case of Shanghai, this study can help offer new insights on the important nexus between the housing market and labor market in urban China.

This paper is organized as follows: we first review the literature on spatial mismatch hypothesis as applied to immigrants in U.S. cities as well as the literature on the housing market and labor market segmentation in Chinese cities. We next present descriptive data on

residential patterns and employment patterns for locals and migrants in Shanghai. We then proceed to empirical testing of the association between ethnic enclave residence and employment probabilities for different groups, and finally we offer conclusions and discussions.

Literature Review

Spatial Mismatch Hypothesis (SMH) and immigrants in U.S. cities

<u>Ethnic enclave residence of immigrants</u>

The Spatial Mismatch Hypothesis (SMH) proposed by Kain (1968) argues that difficulty in accessing suburbanized job opportunities, especially low-skilled jobs, is a major obstacle for inner city minorities which results in their high unemployment rate, long commutes, and low wages (Ihlanfeldt and Sjoquist 1998 for review). The conditions shaping such employment disadvantage include the suburbanization of jobs opportunities, restricted residential location choices of minority workers, and the limited access to public transportation.

While this hypothesis is based largely on the urban experiences of traditional minority workers, recent studies start to apply it to the residential patterns of immigrants in U.S. cities in order to understand whether immigrants face similar spatial barriers in residential choices (e.g. Parks 2004; Painter, Liu, and Zhuang 2007; and Liu 2009). Empirical evidence collected from cities like Los Angeles, Chicago, and Washington D.C. found that immigrants do tend to live in concentrated neighborhoods that feature a high share of co-ethnics to enjoy dense social networks, cultural familiarity, and other economic opportunities. These neighborhoods are termed "ethnic enclaves." Immigrants' high level of residential segregation remain despite gradual spatial dispersion of this group (Cutler, Glaeser, and Vigdor 2005), signifying the importance of these ethnic enclaves for their economic and social wellbeing. In the meantime, the locations of these neighborhoods have diversified over time, now in suburban as well as central cities. The rationale behind these location choices have also expanded from pure "necessity" concerns due to unfamiliarity with American society to "voluntary" preferences, therefore resulting in the higher status enclaves (Logan, Alba, and Zhang 2002).

<u>Ethnic niche employment of immigrants</u>

Labor market segmentation by race/ethnicity, gender, and national origin has been recognized as a prominent feature of urban labor markets in American cities. It is well established in academic literature that immigrant workers tend to be highly specialized and are concentrated in certain industries and occupations in metropolitan areas from New York (Waldinger 1996) to Los Angeles (Ellis and Wright 1999). Social networks are an important mechanism in channeling immigrants to jobs. These ethnic networks connect newcomers to their settled co-ethnics and facilitate the circulation of information regarding housing and job opportunities, as well as cultural and religious activities (Elliot and Sims 2001). As a result, they help shape

the segmentation of the labor market along ethnic lines and the formation of certain industries and occupations that workers from the same origin heavily cluster. Termed as ethnic niche (Waldinger 1994), these over-represented employment concentrations serve as important nodal points in organizing the labor market experience of immigrants.

Institutional Context: Housing and Labor Markets in Urban China

Housing market segmentation and migrant living arrangements in China

<u>Housing-based social stratification</u>

Since the market-oriented reform of its welfare housing system in 1998, China has made impressive progress towards improving the housing conditions for hundreds of millions of urban residents within a short period of time. However, there exists housing inequality in terms of both living conditions and spatial locations in urban China (Huang and Jiang 2009; He et al. 2010). The commercialization of housing provision has significantly transformed the spatial structure of residential pattern in Chinese cities (Wu 2002; Li and Wu 2006). Despite the emphatic shift from the state to the market in the provision of housing welfare (Wang et al. 2012), the state remains the ultimate source of housing welfare for a large urban population benefiting from the state legacy. Beneath the tiers of marketized, subsidized, and social housing exists a fourth tier associated with the migrant population.

The post-reform housing system thus exhibits at least three insider-outsider divides. First, there is a clear insider-outsider divide between households protected from the market and those who have to enter it by paying market prices or rents (Huang and Jiang 2009). A second divide reflects the combined impact of the growth in income inequality and rising house prices under the marketization process—a growing wealth gap is emerging between those who can afford to purchase multiple properties and those who cannot afford to purchase at all, so housing perpetuates inequality (Li 2012). The third divide is between the permanent and migrant population, whose housing options are quite different.

Meanwhile, regional inequality in housing is a salient feature of urbanization in China. At the household level, the inequality of housing in urban China has continued to rise since the marketization of housing provision (Li 2012). A recent empirical investigation shows that the Gini coefficient of housing space per person in Shanghai was more than 0.5 in 2010, significantly higher than that in 2000 (Zhang and Chen 2014). A recent study explores how residential communities are stratified by housing prices and how such spatial clustering is associated with disparities in public service accessibility in Shanghai (Li et al. 2015). Their results demonstrate significant disparities between central city and outer suburbs in housing prices and accessibility to public service infrastructure.

Urban villages and rural migrant informal housing solutions

Despite rapid urbanization, migration in China is still subject to many institutional constraints. The hukou system, the urban registration system that was introduced in 1958 (although it had precedents), has been promulgated as an official tool to control the free movement of people between urban and rural areas (Chan and Buckingham 2008). Under the hukou system, migrants are largely excluded from the welfare package reserved for local residents, including unemployment insurance, health care, pension, housing benefits, and even their children's right to enter local schools (PFPC 2012).

By 2013, there were approximately 240 million migrants without local hukou in urban China. More than 80 percent of them were rural-to-urban migrants, and the rest were urban-to-urban migrants (NBSC 2014). Rural migrants are mainly housed in two broad types of housing. Many are housed in dormitories and other forms of temporary accommodations (e.g., semi-completed buildings on construction sites) provided by employers (PFPC 2012). Others are housed in so-called 'urban village' areas that represent two of the underlying dynamics of urbanization: the rapid expansion of cities into former farmland and the urgent need for migrants to find affordable shelter (Wang et al. 2009).

Urban villages (literally: "villages in a city") are a unique phenomenon in the Chinese urbanization process. They usually refer to villages that were originally located at the outskirts of the city, but have changed to encircled segments situated in the midst of the urban area under rapid urban sprawl. With all surrounding farmlands converted into urban land, the villages themselves are reserved as "rural" and villagers still have a traditional agricultural lifestyle and hold agriculture hukou. This unique phenomenon in urbanization has challenged the simple dichotomy between the rural and the urban (Wang et al. 2009). It usually occurs when the local government fails to find sufficient funding to compensate the villagers for their lost dwellings with jobs and apartments in the city. At first glance, insufficient planning is to blame for the emergence of semi-urbanized spaces and population. However, the development of urban villages is found to be driven by an intertwined complex of institutional settings, including the dual land system, the hukou system, weak village governance, and a scarcity of migrant worker housing (He et al. 2010).

Former farmers owning the land of urban villages construct low-quality, but often multi-story properties and rent them to impoverished migrants at low prices. Urban villages in China share many features with the shanty towns found in other developing countries (Wang et al. 2009). Most of the housing in Chinese urban villages is sub-standard, intensely developed and densely populated, has poor infrastructure, and is often illegal in the sense that they are not recognized by any form of urban planning (Zheng et al. 2009). Urban villages also often become the breeding grounds for social problems such as crime, drug addiction, alcoholism, and prostitution. Some researchers consider urban villages to be a form of slums with Chinese characteristics. However, urban villages provide cheap accommodations for the transient population and allow migrants to access local labor and other markets (Song et al. 2008). Thus,

urban villages are notable hubs for providing economic opportunities to newcomers to the city. Urban villages are also enclaves for landless villagers (He et al. 2010).

Labor market segmentation and migrant employment patterns in China

Institutional Background of China Labor Market Segmentation

China's reforms since 1978 have created a new labor regime with new division of labor, which dramatically affected the working experiences and welfare of China's citizens (Fan 2003). In the socialist planning employments system, cities serve as the centers for trading and manufacturing activities, while rural areas mainly provide cities with low-priced food. The labor market is divided into urban and rural labor markets. The household registration (Hukou) system assigns each person agricultural and non-agricultural status, based primarily on place of birth. In most cases, labor migration is prohibited. The strategy is aimed at achieving rapid industrialization by extracting agricultural surplus for capital accumulation in industries and supporting urban-based subsidies.

The reform regulations were intended to correct the labor market distortions and to facilitate a competitive market. The reform policies in the 1980s encouraged rural farmers to move from the farms to industrial occupations in TVEs (Town and Village Enterprises). The Hukou restrictions on rural-urban migration were gradually lifted in the 1990s. The rural labor force responded to economic incentives by seeking employment in urban areas and was called the 'floating population.' Reform policies on the urban labor market include the introduction of a labor contract system in 1983 and transferring some hiring decision autonomy from the governments to enterprises. The market reforms then allow and encourage firms to minimize costs which result in hiring workers with greater training in order to increase productivity. Fleisher and Yang (2003) report that the average city disposable income was almost three times as high as that in rural areas. This incentivizes rural residents to seek urban jobs. Yet the incomplete reform of the Hukou system constrained labor migration between rural and urban areas and reinforced the urban-rural labor market segmentation.

Evolution of China Labor Market Segmentation

Literature has documented the income disparity between urban residents and rural migrants in China's segmented urban labor market. Fan (2003) shows a high degree of segmentation between rural migrants and urban natives, as well as a high degree of segregation between male and female rural migrants: migrant workers are channeled into segregated low-skilled and low-paying jobs. The reliance of migrants on social networks further reinforces labor sorting and exclusion. Male migrants concentrate in manual work such as construction, while female migrants are highly represented in factory and domestic work.

The great wave of migrants from rural areas and mass lay-offs within state-owned enterprises created a 'three-tier' labor market including urban workers who were not made redundant, urban workers who were retrenched, and rural migrants (Appleton et al. 2004). Urban residents

should no longer be considered as just one entity. There are clearly reform winners and losers amongst urban residents. Marurer-Fazio and Dinh (2002) found the human capital of urban residents is better rewarded than that of migrant workers. Although women migrants and migrants with more than middle-school education have higher returns, the education of migrants is poorly rewarded in general. In the labor market hierarchy, permanent migrants are the most privileged and successful elite, followed by non-migrant natives, and finally temporary migrants at the bottom of the hierarchy. These results hint at a new social order of stratification in Chinese cities, underscoring the compelling relations between internal migration and labor market development in transitional economies (Fan 2003). Empirical evidence based on the employment data in Shanghai in 2003 and 2009 suggests that the disparity of the employment sector, occupation mobility, education rewards, and the effect of career mobility on income diminished in 2009 between urban residents and migrants. More and more migrants entered formal sectors and the education rewards are equalizing. It implies that the urban-rural segmented labor market in Shanghai has grown into a unified labor market. The wage and working time differentials between urban residents and migrants are attributed to education opportunities, instead of sectoral effect between public sectors (urban residents) and private sectors (mainly self-employed migrants) (Démurger et al. 2009). The Hukou system still plays an important role in segmenting China's urban labor market. The degree of discrimination against urban migrants relative to urban locals is greater than that against rural migrants relative to urban migrants. This suggests that nowadays, China's urban labor market is mainly characterized by the segmentation between locals and non-locals, rather than the segmentation between urban residents and rural migrants, which was the case in the past (Cheng and Wang 2013).

While both housing market and labor market segmentation has been examined to some extent, there is inadequate research that links the two in systematic ways. Cheng and Wang (2013) found that neighborhood factors such as housing quality, social interaction and trust, and neighborhood organization and participation has significant effects on migrant workers' wages. Better housing conditions—measured either subjectively or objectively—helped increase wages. More social interaction with locals, better satisfaction towards the neighborhood, and more contact with neighborhood organizations could help migrant workers improve interpersonal relationships, extend social networks, and increase access to employment opportunities and higher wages. In this sense, urban villages bear resemblance to immigrant ethnic enclaves in the U.S. context and it can be argued that dense social networks that exist in these communities might overcome physical barriers to job opportunities for migrant workers.

Data and Methodology

Data and Context

For our analysis, we make use of the 2010 census microdata sample for Shanghai. This sample contains 20,000 households and 55,169 individuals living in more than 200 communities

(equivalent to zip codes in the U.S., *jiedao* in Chinese). We divide the Shanghai population by their local Hukou status and urban/rural origin. Such divisions produced four types of residents: urban locals, urban migrants, rural migrants, and rural residents. For the purpose of our paper, we mainly focus on the first three groups. Urban locals are Shanghai residents with Shanghai hukou, urban migrants are those with other urban hukou, and rural residents are those with rural hukou. A first look at residential segregation by Hukou status is provided in Figures 1 and Figure 2 below.

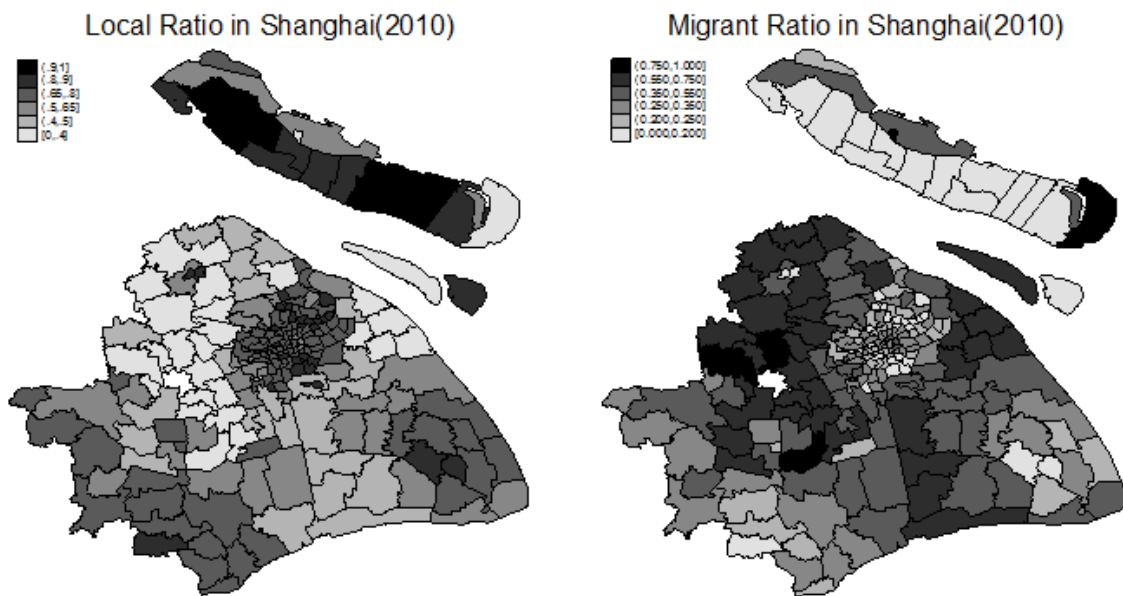## Figure 1. Share of locals and migrants, Shanghai 2010

Local Ratio in Shanghai(2010)

Migrant Ratio in Shanghai(2010)

Figure 2. Share of urban and rural migrants, Shanghai 2010

Rural migrant Ratio in Shanghai(2010)

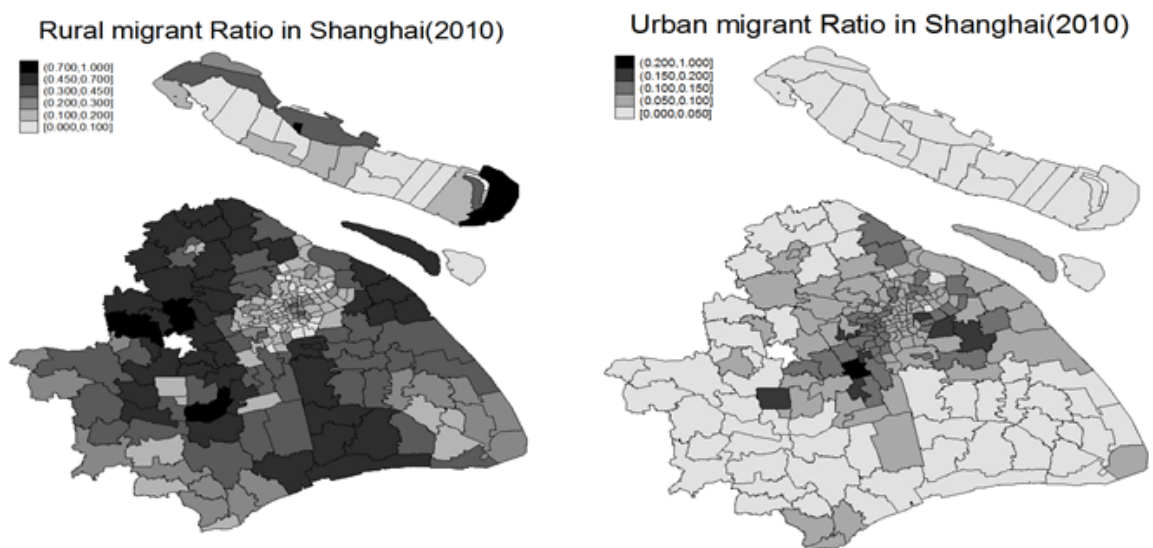Urban migrant Ratio in Shanghai(2010)

Figure 1 and Figure 2 exhibit relative residential concentration of Shanghai locals, rural migrants, and urban migrants, respectively. Comparing locals with all migrants (Figure 1), Shanghai locals have a greater concentration in the central city as well as the West and the Southeast outer suburban areas (Huangpu, Jingan, Changning, Xuhui, Putuo, Zhabei, Hongkou, Yangpu, Qingpu, Jinshan, Fengxian, and Chongming districts), while migrants reside in areas between the central city and outer suburbs, especially in the Northwest and the South (Baoshan, Jiading, Songjiang, Minghang and Pudong). Further breaking the migrants down into urban migrants and rural migrants (Figure 2), shows their distinctive residential patterns. In these five districts where migrants reside, rural migrants live in the outer suburban areas while urban migrants concentrate in the areas near the central city area, including Minhang, Pudong, the luxurious villa area in Songjiang, and the area close to the central city in Baoshan.

The average migrant share at the street (*jiedao*) level is 35.7% in Shanghai, with the lowest share at 5.1% and the highest level at 95.9%. The average rural migrant share at the street level is 28.7%, with the lowest share at 4.7% and the highest share at 93.1%. The spatial distribution patterns are quite similar for all migrants and rural migrants in Shanghai with a high degree of residential clustering. However, urban migrants are quite dispersed residentially, similar to the local Shanghai population with the average share of 7% each street, and the highest share at 20%. It is apparent that segregation levels are quite high for rural migrants in Shanghai.

Define Migrant Enclaves

We calculate Residential Concentration Quotient (RCQ) to examine the residentially-clustered areas for locals, rural migrants, and urban migrants based on *jiedao* level geographic units following earlier works of Liu (2009) for U.S. cities. There are numerous ways to define residential concentrations, using either absolute threshold or some form of relative concentration as compared to city or metropolitan average, and RCQ is one of the latter. We calculate RCQ as below to indicate the migrant enclaves in Shanghai.

$$\text{RCQ}_i = (\frac{M_i}{P_i})/(\frac{M}{P}) \ \ (1)$$

Where $i=(1,…,n)$ and refers to the street. M_i is the number of migrants on a street and P_j is the total population on that street. M is the number of migrants in Shanghai and P is the total population in Shanghai. All data are drawn from the 2010 China 6th Census. An RCQ of 1 means that the migrant concentration in the neighborhood is on par with that for the metropolitan area as a whole, while a quotient higher than 1 indicates a migrant-concentrated location. This method has the advantage of showing relative clustering of different groups as compared to their metropolitan average.

Figure 3 shows RCQs for migrants as compared to local residents and Figure 4 shows RCQs for urban migrants as compared to rural migrants. Both urban migrants and rural migrants

demonstrate a greater level of residential clustering than local Shanghai residents, as illustrated by the existence and number of high RCQ neighborhoods (RCQ>2) on the maps.

Figure 3. Residential Concentration Quotients of Locals/Migrants in Shanghai, 2010
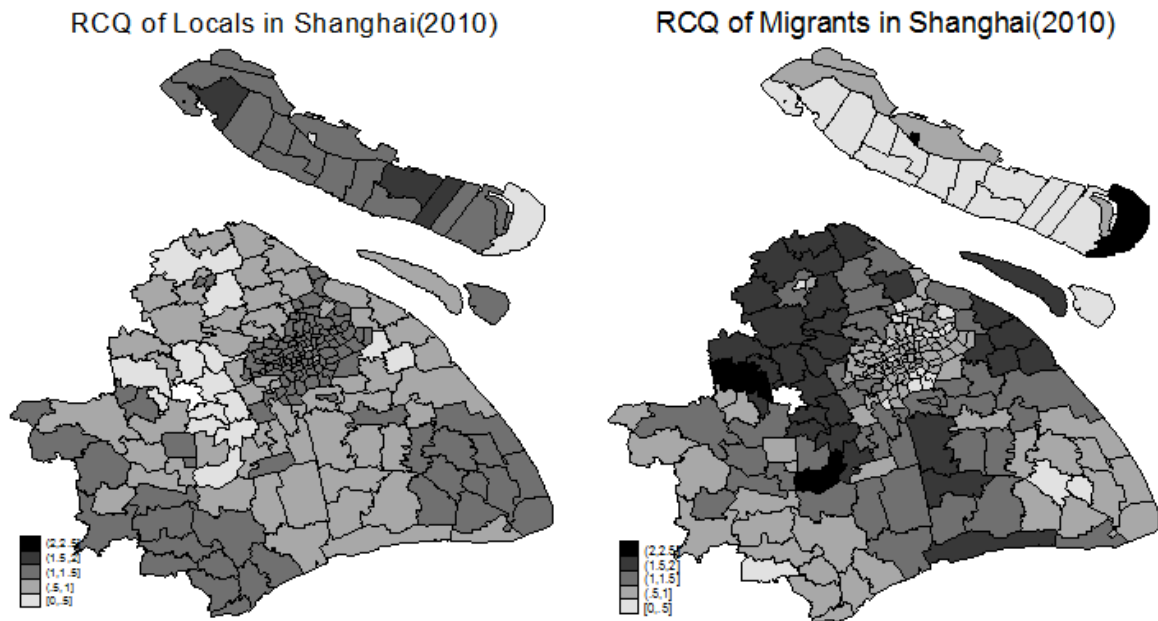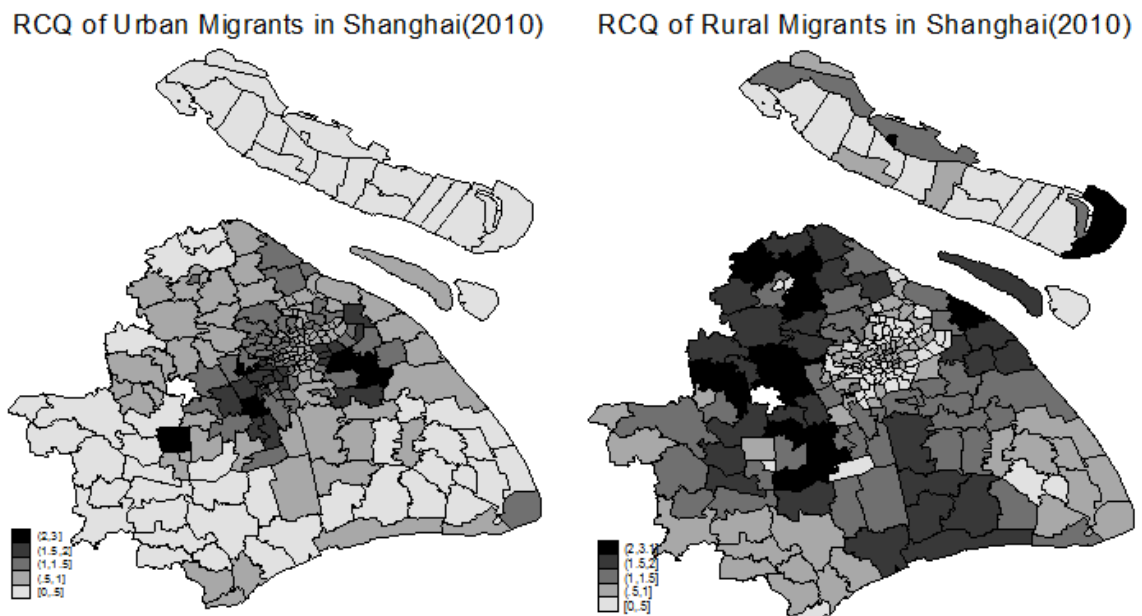
RCQ of Locals in Shanghai(2010)　　RCQ of Migrants in Shanghai(2010)

Figure 4. Residential Concentration Quotients of Urban/Rural Migrants in Shanghai, 2010

RCQ of Urban Migrants in Shanghai(2010)　　RCQ of Rural Migrants in Shanghai(2010)

Methodology and Variables

Dependent Variables

This article examines the effect of living in concentrated enclaves on migrants' employment status. The employment status is measured by the variable 'no job (not retired)' which equals 1 if an individual is not working in the census year and equals 0 if the person has a full-time job.

Other Independent Variables

Besides migrant enclave status, we also include a series of community (street) level and individual level characteristics in our analysis. *Distance between a street's center to CBD* measures the location of a street. This distance to a large extent is a proxy for the job accessibility of the street as Shanghai's employment distribution is largely monocentric. Individual level variables include: three *hukou status dummies* indicating whether a resident is a rural native, urban migrant, or rural migrant (local urban resident is the reference); *Gender* indicates whether an individual is female or not; *Married* is coded 1 if an individual is married, 0 if he/she is single, divorced or widowed; and *Withchild* indicates whether living with one or more children. Four dummy variables are created to capture *age*: younger than 25, between 26 and 35, between 35 and 45, and older than 45 but younger than 60 (older than 60 is reference). Finally, education dummies measure an individual's education level: whether his/her education level is less than high school, high-school graduate, associate degree (technical college), or bachelor degree (completed four-year university) or higher. These are important control variables for employment status, while we focus on the residual effect of living in migrant enclaves.

Model Specification

This study compares the likelihood of employment for migrants and urban natives living in migrant enclaves and non-enclaves when other relevant characteristics are controlled for. Employment status is estimated on the locational effects as well as individual characteristics using probit models. The models are expressed as below:

$$\text{Prob(Employment}_{ij}=1)= f\ (L_{ij},\ X_{ij}) \qquad (2)$$

Where *i* indexes individuals and *j* indexes streets; *employment*$_{ij}$ is a binary variable indicating the employment status (1 is not employed and 0 is employed). L_{ij} is the locational characteristics including central city or suburban area, migration enclaves or not, and the geographical distance between the street and CBD. X_{ij} are individual level variables including hukou status, gender, marital status, with children or not, age, and education.

Descriptive Statistics

Table 1 shows the number and share of *jiedaos* (communities) that are migrant enclaves by various definitions. Generally speaking, rural migrants are more residentially concentrated than their urban migrant counterparts. This is evidenced by the fact that out of 230 communities, 96 are rural migrant enclaves with a RCQ larger than 1, of which 18 have a RCQ larger than 1.5 and less than 1.8, and 34 communities have a RCQ larger than 1.8. In comparison, 82 communities are urban migrant enclaves with a RCQ larger than 1, of which 15 communities have a RCQ between 1.5 and 1.8, and 13 have a RCQ larger than 1.8.

Table 1. Number of Jiedao-Level Migrant Enclaves and Population Share in Shanghai by RCQ						
	All Migrants Enclave Population		Urban Migrants Enclave Population		Rural Migrants Enclave Population	
RCQ	Number	Share	Number	Share	Number	Share
<1	140	33.51%	148	58.30%	134	32.52%
1-1.5	47	33.08%	54	25.85%	44	29.81%
1.5-1.8	20	16.83%	15	8.25%	18	11.85%
>1.8	23	16.58%	13	7.60%	34	25.82%
All	230	100%	230	100%	230	100%
Note: RCQ stands for Residential Concentration Quotient, please see paper for calculation						

Table 1 also reveals population and the population shares residing in different enclaves. We again observe that rural migrants are more concentrated in their residential enclaves than urban migrants. About two-thirds of rural migrants live in enclaves of various levels (RCQ larger than 1) while only less than half of all urban migrants do. The highest clustered communities (RCQ larger than 1.8) are home to a quarter of rural migrants and only 7% of urban residents.

Table 2 compares employment status of rural migrants, urban migrants, and urban natives who live in and out of migrant enclaves. Similar to above, we use three thresholds for the migrant enclave definition: 1, 1.5, and 1.8 to gauge any employment differentials for enclave and other residents. Generally speaking, rural migrants have the lowest unemployment rate of 2.24% out of all groups, followed by urban migrants (4.68%), rural natives (5.46%), and urban natives (13.10%). Differentiating between those living in rural migrant enclaves and those who live out of these enclaves, we observe that rural migrants who live within enclaves tend to have lower unemployment rates than those living out of enclaves. Such a pattern is consistent with three different enclave cutoff levels, indicating that enclave residence might facilitate the employment outcomes of rural migrants. For other groups, enclave residents also have lower unemployment rates than their non-enclave residents, with the exception of rural natives, who fare better out of the enclaves.

Table 2: Unemployment Rate by Rural Migrant Enclave Status in Shanghai, 2010										
	Urban Natives		Rural Natives		Urban Migrants		Rural Migrants		All	
RCQ threshold	In Enclave	Out of Enclave	In Enclave	Out of Enclave	In Enclave	Out of Enclave	In Enclave	Out of Enclave	In Enclave	Out of Enclave
1	11.96	**13.61**	**5.56**	5.34	4.21	**5.09**	2.00	**2.89**	5.24	**9.97**
1.5	10.91	**13.34**	**6.11**	5.22	3.40	**5.01**	1.99	**2.43**	4.03	**8.77**
1.8	11.94	**13.17**	**6.10**	5.36	2.08	**5.14**	2.02	**2.33**	3.83	**8.33**
Total	13.10		5.46		4.68		2.24		7.62	

Table 3: Education level for different groups in Shanghai, 2010					
	Urban Natives	Rural Natives	Urban Migrants	Rural Migrants	Total
Less than High school	3961	1958	734	10624	17277
	22.92%	68.56%	21.80%	77.37%	46.40%
High school diploma	4866	573	634	2297	8370
	28.16%	20.06%	18.83%	16.73%	22.48%
Associate Degree	3560	203	781	547	5091
	20.60%	7.11%	23.20%	3.98%	13.67%
Bachelor's degree or above	4893	122	1218	263	6496
	28.32%	4.27%	36.17%	1.92%	17.45%
Total	17280	2856	3367	13731	37234
	100%	100%	100%	100%	100%

Moving from the housing market to the labor market, Table 3 above shows the educational attainment distribution among the same four groups: urban natives, rural natives, urban migrants, and rural migrants. Educational attainment is divided into four levels: less than high school, high school diploma, technical college/associate degree, and bachelor's degree from a four year university or above. There is a substantial educational divide across the four groups in Shanghai. Rural migrants have the lowest educational achievements overall, with more than three quarters having less than a high school diploma (77.37%), another 16.73% are high school graduates, and merely less than 6% have an associate degree or above (3.98% for associate degree and 1.92% for bachelor's degree or above). While similar, the local rural natives have a slightly higher educational distribution, with 68.56% having less than a high school diploma, 20.06% with a high school diploma, and around 11% with an associate degree or above.

To the contrary, urban natives and especially urban migrants feature relatively high educational attainment, with less than half of urban natives and around 40% of urban migrants having less than an associate degree. For urban natives, 20.6% have a technical college/associate degree and 28.32% have a bachelor degree or above and for urban migrants, 23.2% have an associate degree and 36.17% have a bachelor's degree or above. This is probably a result of the highly selective process through which urban migrants need to go through in order to settle in

Shanghai and such educational disparities and the skill levels they imply would necessarily be reflected in their job niches.

Table 4: Occupations of locals and migrants in Shanghai, 2010					
	Urban Natives	Rural Natives	Urban Migrants	Rural Migrants	Total
国家机关党群组织企事业单位负责人 Public Sector Administrators	1008 7.94%	64 2.89%	255 9.27%	318 2.62%	1645 5.52%
专业技术人员 Technicians and Professionals	3256 25.65%	161 7.26%	815 29.64%	503 4.15%	4735 15.90%
办事人员和有关人员 Office workers	2893 22.79%	219 9.87%	385 14.00%	558 4.61%	4055 13.62%
商业服务业人员 Business and other services	2960 23.31%	430 19.39%	863 31.38%	4201 34.67%	8454 28.39%
农林牧渔业生产人员 Agriculture, Forestry and Fishing	119 0.94%	352 15.87%	5 0.18%	250 2.06%	726 2.44%
生产运输设备操作人员及有关人员 Manufacturing and Operative Occupations	2460 19.38%	992 44.72%	427 15.53%	6287 51.89%	10166 34.14%
Total	12696 100%	2218 100%	2750 100%	12117 100%	29781 100%

Table 4 above further shows the occupational distribution of these groups. Urban migrants have the largest share in public sector administrators (9.27%) as compared to other groups, as well as the largest share among technicians and professionals (29.64%), followed by urban natives in these occupations (7.98% and 25.65%, respectively). Rural migrants play marginal roles in those occupational categories, with 2.62% and 4.15% in those groups, respectively. For the mid-level positions such as office workers or business service and other service workers, urban natives and urban migrants both have considerable shares. Urban natives are equally distributed in these two occupational groups, with 22.79% as office workers and 23.31% as business and other service workers. The shares are 31.38% and 14% respectively for urban migrants. For rural migrants, 34.47% are in service occupations, and only 4.61% are office workers. More than half of the rural migrants (51.89%) are in manufacturing and operative occupations, the highest among all groups, while only 44.72% rural natives, and less than 20% of urban natives and urban migrants are. These occupational segmentations in the labor market are reflective of these groups' educational attainments, and are possibly shaped by their hukou and migration status in the city of Shanghai as well. Rural migrants are highly clustered in the low-skilled and low-paying occupations in the urban labor market, especially manufacturing and services.

Table 5: Industries of locals and migrants in Shanghai, 2010	Urban Natives	Rural Natives	Urban Migrants	Rural Migrants	Total
农林牧渔业 Agriculture, Forestry and Fishing	109 0.86%	342 15.42%	8 0.29%	241 1.99%	700 2.35%
工业 Manufacturing	3547 27.94%	947 42.70%	940 34.18%	5318 43.89%	10752 36.1%
建筑业 Construction	346 2.73%	142 6.40%	137 4.98%	1184 9.77%	1809 6.07%
交通运输 IT Transportation and Information Technology	1675 13.19%	206 9.29%	289 10.51%	824 6.80%	2994 10.05%
批发零售贸易餐饮 Whole sale, Retail and Restaurants	2171 17.10%	214 9.65%	700 25.45%	3034 25.04%	6119 20.55%
金融保险房地产 Finance, Insurance and Real Estate	1171 9.22%	45 2.03%	152 5.53%	257 2.12%	1625 5.46%
商务和社会服务业 Business and Social Services	941 7.41%	107 4.82%	219 7.96%	862 7.11%	2129 7.15%
科教文卫体社保 Science, Education, Culture and Health	1912 15.06%	141 6.36%	292 10.62%	382 3.15%	2727 9.16%
党政机关社会团体 Public Sector and social organizations	824 6.49%	74 3.34%	13 0.47%	15 0.12%	926 3.11%
Total	12696 100%	2218 100%	2750 100%	12117 100%	29781 100%

In addition to occupations, we organized their job patterns by industries (Table 5). Here we see a similar divide in industrial concentration of different groups and their positions in the economy. Again, we can see rural migrants and rural natives are overly represented in manufacturing (43.89% and 42.7%, respectively). But unlike their rural native counterparts, rural migrants are also heavily clustered in the whole sale, retail and restaurants industry with 25.04%. Urban migrants have a similar share in this industry. The other industry that rural migrants have the highest share of all groups is construction (9.77%). Other than that, this group lags behind other groups in its share in transportation and information technology, finance, insurance and real estate, science, education, culture and health, as well as public sector and social organizations. These patterns reflect rural migrants' limited choices in the labor market possibly due to their educational levels and registration status. As they do not have the appropriate educational certifications and skills, or the formal registration status, they are largely excluded from jobs that require a formal application process, including science, education, culture and health, public sector, and social organization, as well as finance, insurance and real estate. Their concentration in the low-skilled sector of the urban economy is a strong indication of labor market segmentation.

Empirical Results

Effect of Migrant Enclaves

Table 6. Probit Regression Results on unemployment status					male rural migrants	female rural migrants	central city rural migrants	suburban rural migrants
	rural migrants	urban natives	urban migrants					
	model 1	model 2	model 3		model 4	model 5	model 6	model 7
female	0.017***	0.002	0.017**				0.021	0.016***
married	-0.016***	-0.093***	-0.005		-0.012***	-0.022**	-0.015	-0.016***
withchild	0.022***	0.008	0.016*		0.021***	0.021***	0.010	0.024***
ageDG2 （26-35）	0.009	-0.023*	-0.019		0.005	0.017	0.029**	0.006
ageDG3 （36-45）	0.008	-0.066***	-0.030***		-0.002	0.025***	0.042***	0.001
ageDG4 （46-60）	-0.003	-0.061***	-0.030**		-0.005	0.005	0.025**	-0.007
education (high school）	-0.003	-0.042***	-0.008		-0.003	-0.004	-0.006	-0.003
education (technical college)	0.002	-0.129***	-0.018		-0.001	0.005	0.006	0.000
education (university & above)	0.003	-0.189***	-0.038***		0.006	-0.003	0.004	-0.001
Distance to CBD	-0.000	-0.003***	-0.001*		-0.000	-0.000	0.003	-0.000
Rural Migrant Enclave RCQ	**-0.005***	**-0.010**	**-0.011**		**-0.002**	**-0.010***	**-0.003**	**-0.007***
Observations	12,089	14,470	2,836		7,076	5,013	2,372	9,717

We examine the effect of migrant enclaves on employment status through probit models. In the first set of results (table 6), we entered rural migrant enclave as the continuous RCQ value to gauge the magnitude of gradual change in rural migrants' share in a community on its residents' employment outcomes. Models 1, 2, and 3 apply the same model to three population groups: urban natives, urban migrants, and rural migrants, with rural migrant enclave RCQ values. Then we further break rural migrants down to different sub-samples. Models 4 and 5 are results on male rural migrants and female rural migrants, respectively, and models 6 and 7 present results on rural migrants living in central city area and those living in suburbs. The models reveal that employment probabilities for migrants are significantly higher (or unemployment likelihood lower) for those living in migrant enclaves while the same effect does not apply to urban natives and urban migrants who reside there.

Model 1 results show that for rural residents in Shanghai, the probabilities of being employed will increase by 0.5% if the RCQ index of rural migrant concentration (enclave) in a street is one unit higher. The results of Models 2 and 3 show that employment probabilities of an urban native (model 2) or an urban migrant (model 3) will not be affected by the degree of rural migrant residential concentration in the same *jiedao*, all else equal. In the literature review, we argued that rural migrants' residential location choices are very limited due to the institutional barriers they face in the housing market and limited financial resources. Therefore, their housing location might likely be involuntary, rather than a voluntary choice, a precondition we

desire in order to examine the association between their residential segregation and labor market outcomes. However, despite these contexts, we still cannot fully disentangle the compounding effect between spatial accessibility and social networks in rural migrants' employment probabilities given enclave residence. Thus we estimate the models on two other groups besides rural migrants with rural migrant enclave RCQ, as these groups will face the same spatial distribution of jobs but they would not enjoy the social networks unique to rural migrants given their disparate location patterns. Thus, the fact that this variable is only significant for rural migrants is suggestive that social networks in these neighborhoods are strong in channeling fellow migrants to suitable job opportunities. In this sense, these enclaves function similarly to immigrant enclaves in the western context, but the basis for such networks may vary and include same kinship, same province, as well as same dialect.

Further investigation shows that the magnitude of such positive enclave effect varies across gender and location, as models 4, 5, 6, and 7 shows. The positive residential enclave effect appears to be significant especially for female rural migrants and suburban rural migrants. Model 5 shows that the employment probability of a female rural migrant is 1% higher if the degree of RCQ of her residential street increases one unit. The employment probabilities of suburban rural migrants increase 0.7% if the RCQ of the residing street is one unit higher. These results indicate the mechanisms and strength of social networks might vary by a number of factors, including gender and location. Gender-specific research suggests that women might be more constrained than men in their job search radius due to their home duties (Parks 2004), thus they might rely more on informal channels in finding jobs, hence the strong enclave effect. At the same time, given the relative paucity of suitable jobs in the suburban areas as compared to inner cities, enclave-based ties might also play a greater role in labor market matching.

Effects of Other Variables

As shown in table 6, demographic characteristics including gender, marital status, living with child(ren), age, education, and location are all associated with employment status for natives and migrants alike. Compared with their male counterparts, both female urban migrants and rural migrants are 1.7% more likely to be unemployed. While gender does not make any difference for rural migrants residing in central city area, female rural migrants living in suburbs are 1.6% more likely to be unemployed than male residents. Those who are married and don't have children are more likely to be employed across different model specifications, though the magnitudes of such effect vary. While age does not significantly predict employment possibilities for rural migrants, more experienced urban native workers and urban migrant workers have lower unemployment rates than young workers (age 18–25). Given the fact that urban natives and urban migrants' presence in the high-skilled occupations, the results might indicate that working experiences are important for those occupations.

Similar to age, having higher educational achievements does not help rural migrants in their employment possibilities while it does play a positive role for urban natives and urban migrants. Getting better education helps urban natives in their employment status. As compared to those with less than a high school diploma, unemployment rates are lowered by

4.2%, 12.9%, and 18.9% for urban natives with high school education, technical college education, and university degree and above, respectively. These results clearly show that better education is valuable for urban native and urban migrants' labor market performance while the same does not hold for rural migrants. This can possibly be explained by the fact that rural migrants concentrate in low-end occupations which mainly demand manual labor. Urban natives and urban migrants occupy high and middle skills positions, which demand higher educational achievements.

Robustness checks

In an effort to further test the robustness of our results, we estimate regression models similar to those presented in Table 6 but with rural migrant enclave dummy variables based on different cutoffs: 1, 1.5, and 1.8 instead of as a continuous variable of RCQ. Our results show that the significant positive association between enclave residence and employment outcomes is only found when we use RCQ equal to 1.8 as the cutoff for migrant enclaves (results available upon request). This result suggests that the positive enclave effect based on social networks is strongest when rural migrant concentration in a community is the highest, which enables the frequent interaction among migrant workers to exchange job and other related information and ultimately leads to employment.

Conclusion and Discussion

Using a representative sample of the most recent Chinese census microdata, this research performs a comprehensive test of the housing market and labor market segmentation in urban China through the case study of Shanghai. As one of the fastest growing metropolises in Asia, or even the world, Shanghai has attracted much policy and academic attention in recent years. Liu (2012) proposed that some of the frameworks originated from the Western world might have its unique manifestations in Chinese cities as the country experiences its urbanization process and argued that the "dual city" paradigm is one of them. This paper provides an empirical test to this idea, that the urban housing market and labor market in China are both segmented and stratified along *hukou* status and migration status and in this sense bear resemblances to the racial/ethnic and immigration status lines that divide the U.S. urban structures.

We find that Shanghai features a high degree of residential segregation among urban natives, urban migrants, rural migrants, and rural natives, with rural migrants concentrated in the outskirts of the city. As our literature review suggests, such residential patterns are shaped by the unique institutional and economic contexts of Chinese cities, which limit the residential choices of rural migrants and crowd many out to "urban villages" on previous farmland. At the same time, due to their relatively low educational attainments and status restrictions, rural migrants largely occupy the lowest tiers of the urban labor market in manufacturing and service occupations and industries which require low skills and have low entry barriers. In this sense, rural migrants are on the bottom hierarchy of both the urban housing and labor markets and are

pushed into the least desirable shelters and jobs, highly analogue to the ethnic enclave residence (Liu 2009) and ethnic niche employment (Liu 2011) faced by immigrants, particularly low-skilled immigrants in U.S. cities.

Despite previous research which shows that these urban villages are lacking in housing conditions, adequate infrastructure, and a healthy and safe environment, our research shows that these communities might provide crucial social networks that link migrant workers to important housing and job opportunities. Thus, social networks can potentially transcend the spatial accessibility barriers these neighborhoods face given their locations and connect workers to their labor market niches. This is evidenced by the fact that the positive effect of living in rural migrant enclaves is not shared by comparable urban natives and urban migrants. We further established that such positive enclave network effects are strongest among female workers and those who live in suburban enclaves. Again, this is contradictory to what the traditional spatial mismatch hypothesis would imply for minority workers but in line with recent findings for the immigrant population in U.S. cities.

In this dual city with a segmented housing market and labor market for different population groups, these enclaves serve as important nodes in organizing rural migrants' lives. While this research moves forward the comparative urban scheme set forth by Liu (2012) in adapting a western-based paradigm to China's urban reality, the actual mechanisms and dynamics in these residential and employment arrangements in China vary greatly from other countries and are bounded by its unique land/housing market and labor market frictions brought about with its urban transitions and reform. Thus, it calls for further studies that seek to understand the inner workings of these neighborhoods and job matching processes which facilitate rural migrants' integration into urban fabrics. Such understanding will also advance urban theories given China's distinctive cases.

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