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Urban inclusive policy, internal migration, and urban development in China

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Urban inclusive policy, internal migration, and urban development in China

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by

Wanyang Hu

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ABSTRACT OF THE DISSERTATION

Urban inclusive policy, internal migration, and urban development in China

by

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Doctor of Philosophy in Urban Planning
University of California, Los Angeles, 2018
Professor Rui Wang, Chair

Labor force is very important to drive urban development. Labor contributes skills and generates positive knowledge spillovers to urban economy, especially high-skilled labor. Labor also constitutes the tax base that determines the fiscal wellness of a city. The major source of urban and regional population change is through internal migration. Given the importance of labor in urban economy, there has been long-lasting research interests in factors that drive inter-city migration. Jobs, amenities, and living costs are regarded as the main determinants of labor migration in regional science. Recent research also points to the importance of local informal institution, such as culture and attitude to migration, in urban development. However, labor mobility within the national border can face formal policy barriers as well. In China, many urban migrants cannot access local social services in host cities due to the lack of local household registration (Hukou), especially social insurances and housing provident funds. Due to the decentralized financing and governance of these social services, cities vary greatly in their coverages of social services among urban migrants. Using these cross-city variations, I define urban inclusiveness as the extent to which a city government allows migrants to access local social insurances and housing provident funds and construct an urban inclusiveness index to measure it. I examine how urban inclusiveness affects urban development via the quantity and quality of labor supply. Specifically, I study three inter-related questions. First, at the individual level, how does urban inclusiveness affect migrants choices of destination cities? Second, at the city level, how does urban inclusiveness impact urban development through aggregate urban labor supply? Third, what factors may explain a citys

inclusiveness for migrants? Using a conditional discrete choice model to examine the role of urban inclusiveness in migrants choices of destinations, I find inclusive cities attract more migrants, controlling for expected wage, housing costs, and a host of urban characteristics that affect quality of life. I then construct a two-sector structural model to estimate how urban inclusiveness affects urban productivity through the quantity and the composition of labor supply. I use historical cultural openness to instrument for urban inclusiveness. I find more inclusive cities perform better economically through higher labor supply, especially high-skilled migrants. Using spatial statistics to correct for spatial error dependence, I find a citys inclusiveness towards migrants largely depends on its fiscal capacity and labor demand, instead of cultural factors. This research reveals the connection among urban inclusiveness, internal migration, and urban development in China. Evidence suggests the importance of attracting and retaining migrant labor through an inclusive urban policy agenda.

The dissertation of Wanyang Hu is approved.

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CHAPTER 1

Introduction

Recent policy debates on immigration in the U.S. and Europe have triggered a new wave of rethinking the impacts of immigrants on the economy of host countries, either in terms of labor market outcomes, productivity and innovation, or fiscal impacts (Borjas, 2003; Rowthorn, 2008; Peri, Shih, & Sparber, 2015). Among others, there have been a consensus on the positive role of high-skilled immigrants, whereas impacts of low-skilled migrants remain controversial (Chiswick, 2011). This correspondingly leads to an increasingly selective immigration policy agenda in most developed countries (Boubtane, Dumont, & Rault, 2016). However, the subjects of these studies are often limited to international immigrants and the claims are usually based on empirical evidence from developed economies, such as the U.S. and EU countries, and are certainly contingent on the specific migrant profile considered. As a counterpart to international immigrants and immigration policy, what is of particular interests to urban scholars but less studied is how inter-city migration exerts influences on urban economies and how local migration policies play a role in it.

In most countries, the size of internal migration is usually much larger than that of international immigration, and so are their influences on receiving cities/regions (Mundial, 2009). Internal migrants also have different characteristics and migration behaviors compared with their international counterpart (Mundial, 2009). Even for international immigration, it is often the specific cities and regions that ultimately absorb the impacts of migration. Similar to cross-border migration, internal migrants supply labor to urban economies, contribute to urban development through their skills and positive externalities. Inter-city/region migrations are also the major sources of urban/regional population changes, and the latter is often regarded as the yardstick of urban development. Given the size and distinctive character-

istics of internal migration as well as its importance in urban development, understanding how internal migrant labor makes inter-city location choices and settlement decisions is thus fundamental and crucial to urban development.

One major distinction between international and internal migration is that literature often assumes zero mobility barriers for internal migration. Moreover, instead of direct examinations of internal migrants impacts on urban economy, urban scholars tend to approach this question indirectly, by analyzing the association between urban productivity and urban size, or the concentration of skilled labor, with the implicit assumption that cross-city labor mobility faces no migration costs, such as policy, cultural or linguistic barriers (Rosenthal & Strange, 2008; E. L. Glaeser & Resseger, 2010; Duranton, 2014). However, such implicit assumption of zero migration barriers is problematic since labor mobility within national borders also faces distortions, such as local attitude towards cultural diversities, local integrations programs targeted to immigrants, or the eligibility to access local public services in certain countries. These local barriers distort urban migrants' choices of cities and settlements through raising or lowering the entry and staying costs in destination cities. At macro-level, these processes are reflected in the quantity and quality of migrants ultimately retained by the city, which further affect urban economic performances through distorting urban labor supply.

These links between migration barriers, internal migration, and urban development have motivated urban scholars to study the driving factors of internal migration. There have been a long-line of research on the relative importance of job opportunities and amenities in directing inter-city labor migration, which motivates cities to strive hard to create jobs and amenities to attract labor, especially skilled labor, in an effort to boost local development. In addition to these two factors, recent research argues a favorable local institutional environment, such as an open attitude towards cultural diversity, can also attract skilled labor and positively contributes to urban development (R. Florida, 2004). Figure 1.1 shows the interrelationships between migration drivers, inter-city labor migration, and urban economic development. Jobs, amenities, and local formal/informal institutions affect the quantity and quality of urban labor supply through distorting the inter-city labor mobility, and further

exert influences on urban economic development through their influences on urban labor stock.

Compared with jobs and amenities, local institutional barriers to inter-city migration have less been investigated in explaining the initiation of migration and the equilibrium distribution of population across cities, let alone their implications to urban economic development. To fill this gap and to extend extant research on the relation between local institutions and urban development, this dissertation seeks to understand to what extent urban migrants in general, in addition to the creative class, respond to an inclusive urban institutional environment as well as local social service provisions,and how this process further influences subsequent urban development.

The institutional background is the household registration (Hukou) system in China. This system assigns residency to each Chinese citizen according to birthplaces and local governments are allowed to determine eligibilities to access local social insurance programs and housing provident funds based on ones local residency. Many cities thus exclude urban migrants, i.e., people who migrate to cities other than their registered places and do not have official local residency, from local social service programs in order to manage local migration flow. Due to the decentralized provisions and financing, cities have very different policies in allowing urban migrants to access these local services. Using cross-city variations in local social service coverages among urban migrants, I define urban inclusiveness as the extent to which city governments allow urban migrants to access local social insurances and housing provident funds as a composite measure of local institutional environment to urban migrants, and examine three inter-related questions. First, how does urban inclusiveness towards migrants affect migrants choices of destination cities and their settlements? Second, how does urban inclusiveness towards migrants impact urban economic development through influencing the quantity and quality of urban migrant stock retained? Third, what economic, political and cultural factors determine a citys inclusiveness towards migrants?

I construct urban inclusiveness indexes with factor analysis to measure the different provisions of social service to urban migrants for over 200 Chinese cities. The Migrant Population Data in 2013 and 2014 in China have social insurance coverage data among urban

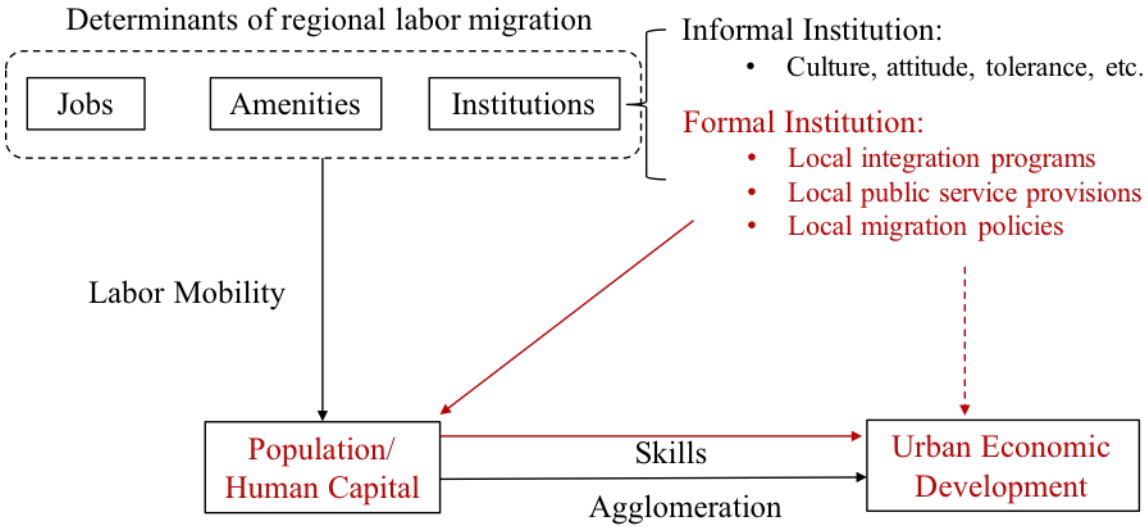
migrants, including pension, medical insurance, unemployment insurance, work-related injury insurance, maternity insurance and housing provident funds. I use these variables to construct inclusiveness indexes for 260 Chinese cities that cover 31 provinces. To understand the role of urban inclusiveness in migrants decisions of selecting destination cities, I predict key migration drivers for each potential alternative destination cities for each individual, and use conditional logit model to test the role of urban inclusiveness in migrants' location choices. I find inclusive cities, i.e., cities that have better coverage of social insurances among migrants, do attract retain more migrants, even after controlling for expected wage, housing costs, migration costs and other urban characteristics that affect quality of life. To investigate the implications of these processes to urban development, I use a two-sector structural urban model with instrument variable in a spatial equilibrium setting to theorize how urban inclusiveness influences urban migrant population size and urban productivity through consumer utility and firm output maximization. I find inclusive cities tend to attract more migrants and have better economic performances in general, but it is the inclusiveness towards high-skilled labor that benefit urban economy the most. Using spatial statistical analysis, I explore factors that contribute to the cross-city disparities in urban inclusiveness. I find a citys inclusiveness towards migrants largely depends on its fiscal capacity and labor demand, instead of cultural or ideological factors.

My dissertation extends current understandings on the role of local institutional environment and local public service provisions in labors location choices and subsequent urban development. My findings suggest cities with favorable institutional environments to urban migrants tend to attract more migrants, and have better economic performance.

It can be generalized to and tested in other policy contexts without explicit internal migration restriction as well. Many local policies and public projects exert direct or indirect impacts on the entering and staying costs of migrants, such as tight land use regulation that raise housing prices, integration programs for immigrants, which essentially distort labors location choices and settlement, and ultimately impact urban development. My dissertation can be generalized to test the roles of these migration barriers in labor relocation at different geographic scales, and shed lights on the demographic implications of these policies

and programs. My dissertation could also inform local policy-makers of their roles in urban development by attracting and retaining desired labor through an inclusive local policy agenda. The following chapters first examine factors that determine a city's inclusiveness to urban migrants. I then investigate how urban inclusiveness affects urban economic performance through labor supply. Lastly, I study the role of urban inclusiveness in migrant labor's inter-city location choices.

Figure 1.1: Relations between local policy/public service provision, urban migration, and urban economic development



CHAPTER 2

Which Chinese city are more inclusive and why?

The household registration system in China is an attempt to manage local migration flows by determining migrants eligibility for access to local public services. Many cities exclude migrants from important social benefits, such as social insurances and housing provident funds, which contributes to the socioeconomic gap between migrants and urban natives. Existing literature seeks to understand the rationale of such internal migration controls and their sluggish reform. This study extends this literature by measuring local migration restrictions and explaining their variation across cities. I define urban inclusiveness as the extent to which urban migrants can access social benefits provided by local governments and I construct an urban inclusiveness index with factor analysis to measures local migration restrictions. I find significant cross-city differences in urban inclusiveness towards migrants. Using spatial models to correct spatial error dependence, I find local fiscal capacity and labor demand, instead of cultural factors, are the major determinants of urban inclusiveness towards migrants. I further use the gap in the inclusiveness indices between high- and low-skilled migrants to measure local skill-based migration selectivity. I find that more developed cities, i.e., cities with larger population, higher gross regional product per capita, and a greater share of employment in manufacturing, are more selective based on migrants skills. Cultural openness does not help reduce this inclusiveness gap. These findings suggest an instrumental view on urban migrants in Chinas urban policy that contributes to social inequality and may cost Chinas long-term growth.

2.1 Introduction

Urbanization has driven economic growth in China and other developing countries, but urban dwellers do not benet from growth equally. In the U.S., large cities tend to have greater income inequality than the rest of the nation (Berube & Holmes, 2015; Shah, Hamilton, Armendaris, Lee, & Armendaris, 2015). Despite an overall improvement in quality of life in China, the richest class has beneted the most from economic growth and the income gap between the richest and middle class or the poor has been constantly enlarging and has remained at a high absolute level (OECD, 2015; Ali & Zhuang, 2007). The unequal distribution of growth benets in cities does not only manifest in income but also in non-income dimensions, such as access to basic services (OECD, 2015; Ali & Zhuang, 2007).

The widening socioeconomic gaps within cities may lead to social and political tensions, and hamper sustained urban economic growth. Concerned with the negative social consequences of the rising inequality in cities, an inclusive development agenda emphasizing a broader coverage of growth beneciaries has been brought to policy discussion (Ianchovichina & Lundstrom, 2009; UN Habitat, 2015). Nevertheless, the current urban literature has yet to dene or measure urban inclusiveness much beyond Richard Florida's concept of tolerance, i.e., an open attitude toward cultural diversity (R. Florida, 2004).

China has been undergoing the largest wave of urbanization in human history (OECD, 2015). The unequal distribution of growth benets in China's cities is exacerbated by the discrimination against urban migrants based on the household registration or Hukou system (OECD, 2015). Chinese local governments use Hukou as a tool to dene access to local public services such as social insurance benets, housing and public education, and many migrants are denied of these benets due to their non-local Hukou. The discrimination and marginalization of urban migrants have led to a persistent socioeconomic gap between urban native residents and migrants (OECD, 2015). Due to such institutional barriers to the equal access to basic public service, urbanization in China essentially becomes an exclusive development process towards urban migrants.

This study examines urban inclusiveness disparities across cities in the Chinese context

and explores its potential causes. I define urban inclusiveness as equal access to social insurance benefits and housing provident funds among urban migrants. I apply factor analysis to construct inclusiveness indexes for over 200 Chinese cities using data on whether urban migrant labor have access to these services in destination cities, and describe the disparities in the degree of inclusiveness towards migrants across Chinese cities. To explain such differentials in urban inclusiveness, I hypothesize that local scal capacity, labor demand, and culture are key factors determining inclusiveness towards urban migrants. I test our hypotheses with multivariate regressions.

The next section provides a review of the denition of urban inclusiveness and existing theories explaining local disparities in inclusiveness towards migrants. Sections Three and Four explain the construction of urban inclusiveness index for Chinese cities and describe its spatial distribution. Section Five explores the explanatory factors to disparities in urban inclusiveness across Chinese cities. The last section concludes the paper.

2.2 Literature review

2.2.1 Urban inclusiveness

In the recent trend of re-dening the measurement of growth, scholars have proposed the concept of inclusiveness and inclusive growth. Two connotations of inclusiveness distinguish it from previous growth measures emphasizing efficiency (Ali & Zhuang, 2007; OECD, 2015; Ianchovichina & Lundstrom, 2009). One connotation concerns the breadth of growth beneciaries, emphasizing the distribution of growth fruits instead of aggregate growth rate (Ianchovichina & Lundstrom, 2009). The other connotation concerns various dimensions of growth and proposes that inclusive growth should not only be measured by income increase, but also an overall improvement in quality of life, including health, education, environment, etc. (OECD, 2015; Spence et al., 2008; Ianchovichina & Lundstrom, 2009). The World Bank defines inclusiveness with an operational framework covering 20 dimensions, such as access to basic services, slum upgrading, spatial access to jobs, etc., in three broad categories,

i.e., spatial, social and economic inclusion (Shah et al., 2015). In general, inclusiveness is a multi-dimensional concept and its target groups can vary, for example low income group, people with disability or elder people.

The concepts of integration and tolerance are also relevant. Primarily targeting immigrants, the EU's Migrant Integration Policy Index (MIPEX) denes integration in eight dimensions that include labor market mobility, family reunion, education, health, political participation, permanent residence, access to nationality, and anti-discrimination (CIDOB and the Migration Policy Group, 2015; Favell, 2001; Martiniello, 2006). In the urban literature, tolerance refers to local attitudes towards migrants or minority groups. Some claim it as a third factor in addition to jobs and amenities that explains urban growth (R. Florida, 2004, 2002b; R. L. Florida, 2002). Despite their differences, inclusiveness, integration, and tolerance all emphasize the equal treatment of people who seek to stay and live in a place (e.g., a city) in terms of economic opportunity and/or civil right.

Equal access to public service is a central aspect of the equal treatment of people. In China, one major institutional barrier that inhibits inclusive growth is the household registration or Hukou system. As a tool to manage migration, local governments use Hukou to determine access to public services. Moreover, contrary to most countries, local governments in China are responsible for providing most social insurance benefits and managing social insurance funds (including housing provident funds). This decentralized governance structure of social insurance and housing provident funds gives local authorities great autonomy in social security policies, resulting in significant disparities of coverage across cities. Cities differ not only in terms of contribution rate, benefits calculation base and methods, but also in their inclusion of urban migrants (Zhu, 2016; G. Zhang, 2015; US Social Security Administration, 2017). This has created a growing socioeconomic gap between urban natives and urban migrants, preventing many urban migrants from reaping the benets of urban growth (OECD, 2015). Under this institutional arrangement, I use the variations in social benefits coverage among migrants across Chinese cities to measure the level of urban inclusiveness towards urban migrants. [1] This operationalization specifically measures the public service

[1]Urban inclusiveness measured by the coverage of social insurance among urban migrants quanties the

inclusiveness to migrant labor. [2]

2.2.2 Explaining inclusive policy

Most studies on inclusiveness and integration focus on their denitions and descriptive analysis, whereas few have attempted to explain determinants of such policies directly. Designed to manage urban migration ow in China, inclusive policies and the underlying Hukou system reflect urban migrants ease of staying in host city, thus act as local migration policies. Recent literature suggests five major explanations of local migration policies.

Fiscal burden: Fiscal burden model argues that places with greater fiscal exposure to migrants tend to see a rise in anti-migration sentiment, especially against low-skilled migrants. Places like these usually allow migrants to access more public services or have a high-level of redistribution. The welfare magnet theory has argued that places with generous redistributive policies, such as subsidized medical care and education, tend to attract low-skilled labor, induce welfare migration, and lead to an increased burden to local public services (Borjas, 1999; Boeri, Hanson, & McCormick, 2002). Thus, the rich are concerned about anticipated higher tax induced by the increased scal burden from migrants, whereas the poor are worried about the increasing competition on welfare benets with more migrants cutting the cake (Hainmueller & Hiscox, 2010; Facchini & Mayda, 2009). This argument aligns with the welfare competition hypothesis, which claims that states are reluctant to raise welfare benets for fear of attracting poor migrants and increasing tax burden (Brueckner, 2011). However, local scal exposure to migrants is very difficult to measure since migrants use different forms of local public services with varying intensity, depending on local policies and migrants socioeconomic characteristics (Hanson, Scheve, & Slaughter, 2007). Furthermore, migrants contribution to local taxes is also difficult to estimate (Hanson et al., 2007).

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de facto restrictiveness of the migration policy instead of the *de jure* restrictiveness (X. Clark, Hatton, & Williamson, 2007; Hatton & Williamson, 2009; Berthelemy, Beuran, & Maurel, 2009; Hatton, 2014). Thus what I measure reects the outcome of cities policies rather than their intended objectives.

[2]It is very challenging to measure the full dimensions of the concept of inclusiveness, thus in our research, I operationalize inclusiveness through the lens of local social service provisions to urban migrants. In this way, I focus on the service provision dimension of inclusiveness concept and the target group of inclusion under examination is urban migrants.

Existing literatures usually use coarse indicators such as local welfare spending and share of migrants in welfare programs to measure local scal exposure to migrants (Hanson et al., 2007; Hainmueller & Hiscox, 2010).

Similarly, studies in China also suggest that one major factor that motivates local governments against migrants access to local Hukou is the perceived fiscal impacts brought by migrants (Xia, 2004; Melander & Pelikanova, 2013). Zhang and Tao (L. Zhang & Tao, 2012) find that cities with higher fiscal capacities have higher entry qualifications, instead of vice versa (L. Zhang & Tao, 2012). Potential fiscal burden is also the major constraint that limits extending social service provisions to migrants in China, as well as the main cause that leads to the failure of a number of ambitious pilot Hukou reform programs in China (Melander & Pelikanova, 2013).

Labor market competition: Labor market competition theory argues that local migration policy will be more restrictive if inux of migrants is perceived to compete with native residents for jobs and drive down local wages (Hainmueller & Hiscox, 2010; Milner & Tingley, 2011; Scheve & Slaughter, 2001). However, a native's view on migrants impact on labor market outcomes (employment and wages) is highly dependent on one's own labor market positions. More often than not, natives will be most opposed to migrants with similar skill levels to their own but less hostile towards migrants with different skill sets (Hainmueller & Hiscox, 2010; Milner & Tingley, 2011; Scheve & Slaughter, 2001). Such pro- or anti-migration sentiments would influence policy agenda through the median voter. However, given the lack of direct voting in China, it is difficult to argue that economic self-interests can affect aggregate political preference at city level through some form of collective action or that local decision-makers can be inuenced by such diverse interests. Therefore, the theory of labor market competition may not be able to explain urban inclusiveness in China.

Cultural and ideological explanations: In addition to migrants scal impacts and labor market effects, non-economic factors such as culture and ideology are also important in predicting local political preferences for migration. Existing research indicates that certain culture or ideological orientations tend to have higher tolerance and stronger preferences for cultural diversity, thus more likely to be inclusive towards migrants (Hainmueller & Hiscox,

2007; Burns & Gimpel, 2000; Milner & Tingley, 2011; McLaren, 2003; Citrin, Green, Muste, & Wong, 1997).

Spatial competition: Spatial competition provides another explanation for local migration policies (Bertoli & Moraga, 2013). This theory argues that because the relative attractiveness of alternative destinations determines migration ow, both the receiving country's migration policy, and its neighboring countries policies may influence the migration outcome. Policy makers would take such effects into consideration, which would lead to spatial autocorrelation of migration policies between neighboring countries (Boeri & Brucker, 2005; Bertoli & Moraga, 2015). Rayp et al (2016) find signicant cross-country correlations in the restrictiveness of migration entry policy in Europe, after controlling for other political and economic factors, which might be a result of strategic coordination in migration policy among countries (Rayp, Ruyssen, Standaert, et al., 2016).

Labor demand: In addition, one direct use of migration control is to manage local labor supply in response to local labor demand (Borjas, 2004). Thus relative local labor supply, as well as other factors that inuence labor's demand for locations, such as natural amenities, may contribute to local policy-making and affect urban inclusiveness.

2.2.3 Urban inclusiveness in China

This section briefly summarizes the literature specifically explains the existence of Hukou system and the difficulties to relax it. Designed in the 1950s, Hukou aimed to reduce cities burdens of providing public services to rural migrants and to ensure the development of heavy industries in cities by limiting rural-to-urban migration (Cai, Du, & Wang, 2001; J. Li, 2005). It has been an important tool to manage the flow and allocation of labor in the planned economy. In recent years, there has been a consensus on the potential benefits of relaxing Hukou barriers (Cai et al., 2001; M. Lu, 2011; W. Lu & Zhang, 2016). However, the actual reform of Hukou system has been sluggish (Melander & Pelikanova, 2013). Many studies, predominantly qualitative research, have been seeking to understand why Hukou restriction is difficult to relax and have proposed several explanations. First, Hukou reform

is not directly relevant to the current major objectives of central and local governments. It has been argued that the policy choices of local government in China are governed by two ultimate goals, i.e., economic growth and public support by local official residents (Cai et al., 2001; Wang, Wang, & Huang, 2010; J. Li, 2005). These are the two main criteria used by upper-level governments to evaluate the performances of local governments. However, Hukou reform is not directly relevant to either of these goals and thus dis-incentivizes local governments to relax Hukou barriers. Furthermore, the large and persistent welfare gaps between urban and rural residents have motivated urban residents who have benefited from such institutional arrangements to protect Hukou barrier since removing it may harm their general welfare (Solinger, 1999; Cai et al., 2001). Finally, local governments believe that relaxing local Hukou barrier may lead to too much fiscal burden to provide public services to urban migrants (J. Li, 2005; Xia, 2004; Wang et al., 2010). This concern is especially true for big and rich cities with better quality of public services since they often attract a mass of migrants given the large regional disparities in economic growth, income, and level of public service provisions (Xia, 2004). Path dependency and the need to accommodate existing institutions also contribute to the slow reform of Hukou restriction (J. Li, 2005). However, despite the general explanations of why Hukou restrictions are difficult to relax, the majority of these studies fail to explain why regional disparities exist in Hukou restrictions across cities. To date, only a few studies have sought to examine this question (Wu, Zhang, & Chen, 2010; Wu & Zhang, 2011).

Xia (Xia, 2004) theoretically models the incentives of central and local governments to impose barriers to labor mobility in China. However, the paper approaches this issue only from the perspective of public revenue and spending, and thus by construction, it assumes migrants only affect cities through tax bases, fiscal revenues and expenditures. It ignores migrants other impacts on cities, such as local labor market outcomes, productivity, etc. It also disregards the skill differences among migrants. Assuming the objective function of local government depends on GDP growth and the social welfare of local citizens, Wang et al (Wang et al., 2010) derive that local wage and the contribution of human capital to GDP are negatively associated with local Hukou threshold, whereas priority given to local citizen's

welfare in policy arrangement is positively associated with Hukou threshold. However, the study only empirically tests the hypotheses on local wage and the contribution of human capital to GDP, while only providing suggestive evidence for the last proposition on the priority of local citizen's welfare in policy agenda. In addition, in the empirical testing, the sample of cities only limits to province capital cities and four major cities. Furthermore, the paper uses the net increase of population with Hukou to measure the ease of obtaining Hukou. This measurement implicitly attributes all changes in Hukou population to the difference in Hukou threshold, whereas it is the supply and the demand of local Hukou together that jointly determine the changes in the number of Hukou population.

Zhang and Tao (L. Zhang & Tao, 2012) examine requirements to obtain local Hukou in 45 major Chinese cities and construct city's entry barrier (CEB) index to measure the degree of difficulties of acquiring local Hukou. The study further uses confirmatory factor analysis with twenty-two variables to identify the key factors that explain the cross-city variations in the CEB index. It finds local fiscal capacity, regional economic development, and population size positively correlate with CEB index. Local living standards, administrative power, infrastructure quality, economic openness, and industrial structure also explain variations in CEB. However, this study has several caveats. First, relying on a data-driven approach, the paper fails to justify the behavioral foundations to extract the five major explanatory factors of the CEB and the selection of variables used to construct each factor. Second, despite covering all provinces in China, the 45 cities in the sample may not be representative of all cities in China. In addition, a data-driven approach is insufficient to obtain the elasticity of each factor with respect to the dependent variable, or test the statistical significance of each factor/ variable. Another important distinction in all extant studies is that, Hukou restrictions or thresholds is not equivalent to the cities' provisions of social services to urban migrants, although they are similar constructs to measure local migration policy and may share some common explanatory factors.

Hukou restriction measures the easiness of obtaining local Hukou and becoming official local residents for urban migrants, which is more relevant to migrants with permanent settlement intentions; whereas inclusiveness in this research targets urban migrants in general,

including circulating migrants. Moreover, inclusiveness measures the actual social benefits coverage among urban migrants, which may or may not be associated with Hukou restrictions, and the actual coverage of social benefits is more relevant to explain migration behavior since a local residency status without any potential benefits attached is unlikely to be a valuable attraction to migrants. Empirical evidence also shows these are two different concepts. Wu and Zhang (Wu & Zhang, 2011) find that coastal cities have higher Hukou barrier compared with western cities, whereas our analysis indicates that coastal cities have better coverage of social insurances among migrants; Melander and Pelikanova (Melander & Pelikanova, 2013) find city size negatively correlates with Hukou restriction, but positively correlates with local social service provision (Melander & Pelikanova, 2013). In other words, better provisions of social services to migrants do not equal to a lower Hukou restriction, and the former is the *de facto* factor that exerts real influences on migrants' location choice.

Overall, little research has investigated the explanatory factors of cross-city disparities in urban inclusiveness measured by the provisions of social benefit to migrants in China, let alone factors associated with the selectiveness in the local provision of social benefits.

2.3 Measuring inclusiveness

I use data from the Migrant Population Data in 2013 and 2014 (National Health and Family Planning Commission of PRC 2013-2014) to construct the local inclusiveness index. This survey uses a stratied, multi-stage probability proportional to size (PPS) scheme to sample (without tracking) around 160,000 urban migrants in over 300 Chinese cities in 31 provinces annually. The migrant population in this survey includes people who have resided in current city for more than one month, without local Hukou, and aged between 15 and 59 by the time of survey. The size of migrant sample in each city, ranging from 10 to 7999, is proportional to the total estimated migrant population in that city. I pool the 2013 and 2014 data and analyze cities with sample sizes meeting the thresholds calculated according to specific

margin of error and level of confidence criteria. [3] The migrant survey data do not distinguish between a city proper and its surrounding towns smaller urban centers that are often not contiguous from the city proper but within the prefecture region. Thus, I include all subordinate administrative units of a prefecture-level city region.

The Migrant Population Data contain information on whether migrants are covered by the following local public services in current city: five types of social insurances (pension, medical insurance, unemployment insurance, work-related injury insurance, and maternity insurance) and housing provident fund. However, the individual coverages are highly correlated so cannot enter our final analysis directly. To address the multicollinearity, I assume that the observed public service coverages reflect the underlying inclusiveness level towards migrants in a city. Therefore, I use factor analysis to extract the latent factor and construct an inclusiveness index to capture urban inclusiveness level towards migrants. Specifically, I assume that the observed public service coverage is a function of the latent inclusiveness and a random error, or

$$x_{ij} = \alpha_{ij} Inc_j + e_{ij} \tag{2.1}$$

where x_{ij} is individual $i's$ observed social insurance benets and housing provident fund coverage in city j, $x_{ij} = 1$ if this person has the kind service, 0 otherwise; α_{ij} is factor loadings; inc_j is the latent inclusiveness level towards migrants in city j; e_{ij} is a random measurement error. I then apply the principal component factoring method [4] (Commission et al., 2008). Table 2.1 shows the results of factor analysis on the six variables. The first factor explains 89% of the total variance in the data and is retained to construct the inclusiveness index. Factor loadings in Table 2.2 are the weights of each variable in the extracted common factor or correlations between them. Table 2.2 shows that most variables have very high positive loadings on the extracted factor, indicating our inclusiveness index could reect the

[3]The data I use define migrants based on their current non-local Hukou. This excludes migrants who have already obtained local Hukou.

[4]The principal component factoring method is the most commonly used data extraction method in constructing composite indicators with factor analysis.

overall coverage of social insurance benets and housing provident funds. [5]

Table 2.1: Factor analysis of migrants public services

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.322	5.037	0.887	0.887
Factor2	0.285	0.088	0.048	0.935
Factor3	0.197	0.067	0.033	0.967
Factor4	0.13	0.083	0.022	0.989
Factor5	0.047	0.029	0.008	0.997
Factor6	0.018		0.003	1

Table 2.2: Factor loadings (factor 1 of Table 2.1)

Variables	Factor loadings	Unique variance	Scoring coefficients	KMO
Pension	0.967	0.064	0.182	0.826
Medical insurance	0.969	0.062	0.182	0.844
Work injury insurance	0.92	0.154	0.173	0.923
Unemployment insurance	0.981	0.038	0.184	0.874
Maternity insurance	0.914	0.165	0.172	0.934
Housing provident fund	0.898	0.195	0.169	0.923
Overall				0.882

Note: Unique variances are the remaining variances in the data that cannot be explained by the common factor. Only a very small proportion of variance remains unexplained in each variable, especially for pension, medical insurance and unemployment insurance, each with uniqueness below 10%. The scoring coecients are the regression coecients used to estimate the individual inclusive scores, and each variable is almost equally weighted in the nal index. KMO test and Bartlett's sphericity test results indicate high correlations exist among the six original variables. It suggests that the composite inclusiveness index from factor analysis can efficiently summarize the latent information contained in the six original variables, which justifies our usage of factor analysis.

Factor analysis produces an inclusive score for each observation in the data. I then compute the average inclusiveness at city level using the individual scores. Since I am using sampled migrants to infer average inclusiveness level in each city, measurement error becomes a concern when sampled migrant size in an individual city is too small. In addition to a full sample analysis that includes all cities regardless of its sampled migrant size, in subsequent analysis I also use a restricted sample of cities, in which only cities whose sampled migrant sizes satisfy pre-specified margin of error (MR) are included to infer the population average.

[5]Since I only have one factor retained, the rotated and non-rotated factor loadings are the same.

I need to emphasize that the constructed urban inclusiveness index, measured by the social insurance and housing provident funds coverage, represents the *de facto* policy outcome instead of *de jure* policy expectations.

To better differentiate urban inclusiveness level towards migrants with different skills, I computed the respective inclusiveness index for high-skilled and low-skilled migrants. I define high-skilled migrants as migrants with bachelor and above degrees and low-skilled migrants as migrants with below bachelor degrees. Migration policies are usually highly selective and the most prominent factors that determine such selectivity are migrants skills and education (Rayp et al., 2016). Thus, I use the inclusiveness gap between high-and low-skilled migrants to capture such migrant selectivity. The next section provides a detailed description of urban inclusiveness level in China.

2.4 Inclusiveness in Chinese cities

Table 2.3 is the descriptive statistics of inclusiveness using the full city sample. The average inclusiveness level for high-skilled migrants is almost four times as high as that of low-skilled migrants, but its variation across cities is also larger.

Existing migration literature distinguishes between migration restrictiveness and selectivity. Restrictive policies are measures that decrease all migration, whereas selective policies favor migrants with higher levels of skill or education or other social characteristics (Rayp et al., 2016). For example, countries that are the least restrictive also tend to be the most selective (Rayp et al., 2016). Interestingly, I also found a similar pattern across Chinese cities. Table 2.4 shows the Pearson correlations and their corresponding p-values (in parentheses) between the inclusiveness indexes. Full samples of cities are used to compute correlations in the rst row and restrictive samples are used in the second row of each cell. As shown in Table 2.4, inclusiveness gap positively correlates with overall inclusiveness and inclusiveness for high-skilled migrants, indicating that cities that are more inclusive, especially towards high-skilled migrants, are also more selective in terms of migrants education.

Figure 2.1 shows the inclusiveness level and gap in Chinese cities. I group values by quin-

Table 2.3: Descriptive statistics of urban inclusiveness

Variables	Definition	Mean	Median	S.D	Min	Max
		Obs=255				
Urban inclusiveness index	An index created with factor analysis using the coverage of five social insurance benefits and housing provident funds among migrants; Average inclusiveness is the mean value of inclusiveness index in each city	0.104	0.077	0.09	0	0.622
Urban inclusiveness index for high-skilled migrants	The mean value of inclusiveness index for migrant with bachelor and above bachelor degree; measure urban inclusiveness to high-skilled migrant	0.308	0.298	0.204	0	1.016
Urban inclusiveness index for low-skilled migrants	The mean value of inclusiveness index for migrant with below bachelor degree; measure urban inclusiveness to low-skilled migrant	0.077	0.056	0.076	0	0.523
Inclusiveness gap	Inclusiveness gap between high-skilled migrant and low-skilled migrants	0.232	0.224	0.165	-0.076	1.016

Table 2.4: Correlations of inclusiveness indexes

Pearson Correlation	Overall inclusiveness	High-skilled inclusiveness	Low-skilled inclusiveness
High-skilled inclusiveness	0.769 (0.000)		
	0.860 (0.000)		
Low-skilled inclusiveness	0.943 (0.000)	0.618 (0.000)	
	0.947 (0.000)	0.719 (0.000)	
Inclusiveness gap	0.529 (0.000)	0.944 (0.000)	0.324 (0.000)
	0.669 (0.000)	0.950 (0.000)	0.467 (0.000)

tiles, with darker color representing higher inclusiveness. Cities in developed regions, such as Beijing-Tianjin area, Yangtze River Delta, Pearl River Delta and Chengdu-Chongqing area, tend to be high in inclusiveness, although there are cities with high inclusiveness levels scattering around in other regions. No matter clustered or dispersed, cities with high inclusiveness levels tend to overlap with cities with high inclusiveness gaps between high-skilled and low-skilled migrant labor.

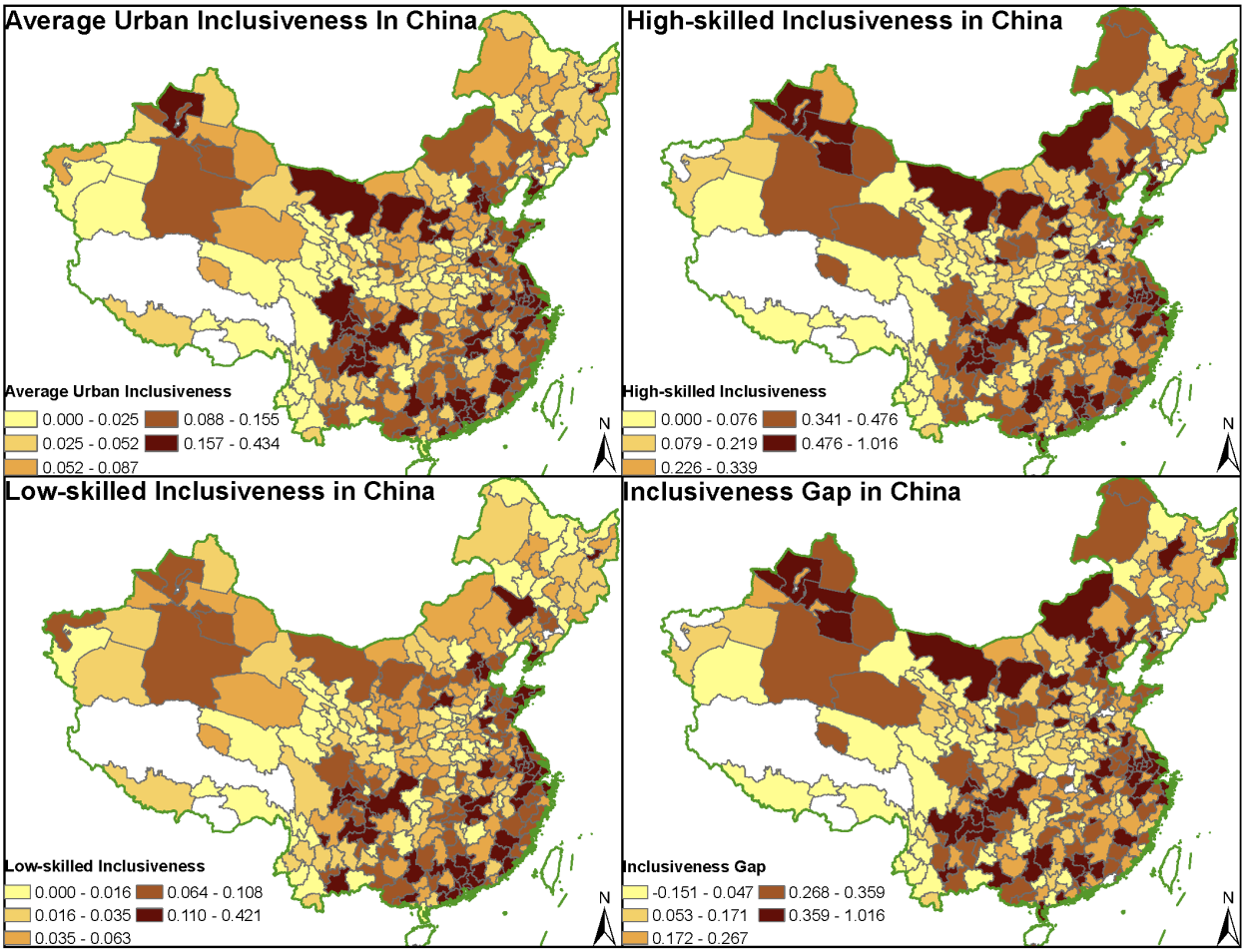

Figure 2.1: Spatial patterns of urban inclusiveness in Chinese cities

2.5 Explaining differences in inclusiveness

2.5.1 Hypotheses

Adapting existing theories that explains local migration policies in the U.S. and research that explains Hukou restriction in China, I propose the following hypotheses to explain urban inclusiveness in China.

Hypothesis 1: Cities with higher local Gross Regional Product (GRP) per capita are more inclusive. Richer cities tend to be less fiscally exposed to migrants given their higher fiscal capacities. I use local GRP per capita as a proxy for local fiscal capacity. [6]

Hypothesis 2: Cities that have historical exposure to diverse culture are more inclusive. The Contact Hypothesis in sociology states that social contact and proximity are conducive to reduce prejudice (Allport, 1979). Hence, places that were exposed to foreign culture in recent history are likely more open towards migration and consequently more inclusive.

Hypothesis 3: Cities with a higher share of Foreign Direct Investment (FDI) or industrial sector in local economy are more inclusive. FDI and the industrial sector play important roles in urban labor demand given the labor-intensive nature of most FDI and manufacturing firms in China. I expect a positive relation between inclusiveness and demand for labor relative to local economy, controlling for local population (labor supply [7]).

2.5.2 Model

Equation 2.2 specifies the empirical model.

$$inc_{jk} = BX_j + \gamma_k + \epsilon_j \tag{2.2}$$

[6] I use GRP per capita instead of the ratio between general scal revenue and expenditure to indicate scal capacity for the following reasons: 1) the main funding sources of social insurances and housing provident funds are social insurance fees and housing provident fees (Ministry of Finance of the PRC, 2015a), which are unobservable to us but usually proportional to local wages; 2) general scal budget usually does not include important revenue sources such as land leasing fees, which are often used to nance local public services.

[7] I also use total working age population (population between 16-65 years old) in 2010 Population Census and it yields similar results. The two measures of population/labor size have a high correlation of 0.9.

inc_{jk} is the inclusiveness level of city j in province k; X_j are the urban characteristics that may affect inclusiveness level; γ_k is province fixed effect;ϵ_j is the error term. Since our aim is to test the overall explanatory factors to urban inclusiveness instead of the causal contribution of a specific factor, this simple reduced-form model is sufficient to test the associations between several hypothesized explanatory factors and urban inclusiveness level based on previous proposed theories.

In X_j, I use the historical status of a city as a treaty port or a foreign concession in late 19th century to construct a cultural openness index to measure such local culture or ideology towards migrants. I measure the importance of FDI to a city by a composite index based on the share of local industrial values and rms that use non-domestic funds. The share of GRP in the secondary industry measures the importance of the industrial sector. In addition, other urban attributes that determine the migrant labor supply of a city, such as natural amenities, may influence inclusiveness. Specially, climate and coastal access have shown to be powerful predictors of domestic migration in the U.S. (E. L. Glaeser, 2008). They are important components of quality of life and consumer amenities, which attracts migrants and can offset other undesirable local features. Local government may consider the values of these amenities to migrants in designing local inclusiveness level. To control for these natural amenities, I include average January temperature and a dummy variable indicating coastal cities. Province fixed effect is included because of provincial influence on local social insurances and housing provident funds policies through fiscal transfer and other channels. Finally, it is worth noting that the 2014 National Hukou Reform Policy Frame, proposed by the State Council of PRC, sets different guidelines on Hukou reform for small, middle-sized and large Chinese cities, with the *de jure* policy frame sets more inclusive benchmark for small and mid-sized cities than large cities. For example, small cities (township and county-level cities) are completely open to migrants, while mid-sized cities (with a population between 500,000 and 1,000,000 in city proper), large cities (between 1,000,000 and 5,000,000), and mega-cities (over 5,000,000) have incrementally more restrictions on migrants access to services, especially for mega cities (State Council of PRC, 2014). [8] Moreover, this national

[8]As a result, this round of Hukou reform has essentially ruled out mega-cities from liberalizing their

policy guideline leaves more freedom for large cities and mega-cities to design specific policies. To better control for the effect of such *de jure* policy guideline from the central government, I create dummy variables indicating small, mid-sized, large, and mega cities in terms of urban population.

Using Lagrange Multiplier tests in the residuals estimated in Model 2.2, I found evidence of spatial autocorrelation in error terms but not the dependent variable. [9] To correct for such spatial dependence in error term, I specify a spatial error model (Eq. 2.3) to improve efficiency in estimation.

$$inc_{jk} = BX_j + \gamma_k + \epsilon_j$$

$$\epsilon_j = \rho W \epsilon_j + \mu_j \tag{2.3}$$

inc_{jk} is inclusiveness of city j in province k; X_j is a vector of variables that explain inclusiveness; γ_k is province fixed effect; ϵ_j is the error term; ρ is the spatial lag coecient in error term; W is spatial weight; μ_j is error term that follows standard independence assumption. All spatial weights in the spatial error model are calculated using standardized contiguity weight matrix.

2.5.3 Data

Table 2.5 shows the denitions, data source and summary statistics of explanatory variables. FDI and cultural openness are two composite indexes created by factor analysis. FDI index measures share of total gross industrial output values and number of rms using funds from outside Mainland China. Cultural openness is indicated by whether the city was a foreign concession or a treaty port in late 19th century to capture historical openness to diverse culture. The large differences between the mean and median in FDI and cultural openness indexes suggest positively skewed distributions in these two variables. The average share of GRP in the industrial sector in sampled cities is around 50%, indicating that most Chinese

Hukou control. The bigger the city is, the less likely it is to be open (OECD, 2015).

[9]The p-values of the Lagrange multiplier tests in overall inclusiveness, high- and low-skilled inclusiveness OLS regressions are 0.06, 0.006 and 0.006, respectively.

Table 2.5: Summary statistics

Variables	Definition (obs=255)	Mean	Median	S.D	Min	Max
GRPPC	Log of GRP per capita (yuan) [a]	10.7	10.7	0.593	9.41	12.6
POP	Log of total urban population [a]	15.2	15.2	0.64	12.9	17.1
INDUSTRY	Percentage of GRP in secondary industry [a]	0.503	0.508	0.091	0.168	0.774
FDI	Index measuring share of industrial values and share of total firms that use non-domestic funds [a]	-0.032	-0.439	0.972	-0.898	4.07
CULTURE	Index indicating whether city was a foreign concession or a treaty port in late 19th century [b]	0.11	0	0.278	0	1.02
JANTEMP	Average January Temperature from 1981 to 2010. Unit: [c]	1.9	3.9	8.75	-24.8	17.2
COAST	Dummy indicating whether the city is a coastal city; Yes=1, 0 otherwise [d]	0.106	0	0.308	0	1
MEGA	District population above 5 million; Yes=1, 0 otherwise [a,e]	0.043	0	0.204	0	1
LARGE	District population between 1 and 5 million; Yes=1, 0 otherwise [a,e]	0.467	0	0.5	0	1
MIDSIZE	District population between 0.5 and 1 million; Yes=1, 0 otherwise [a,e]	0.345	0	0.476	0	1

Source: a. China City Statistical Yearbook;
b. Zhang 1993;
c. China Meteorological Data Service Center, http://data.cma.cn/en;
d. China's History in Maps, http://worldmap.harvard.edu/maps/china-history;
e. State Council of PRC. National policy frame for hukou reform.
http://www.gov.cn/zhengce/content/2014-07/30/content_8944.htm.

urban economies rely heavily on manufacturing. About 10% of the cities in our sample are along the coast. I use dummy variables to indicate cities of different sizes: mega cities (4% cities in our sample), large cities (46.7%), and mid-sized cities (34.5%).

Because the dependent variables are the averages of individual observations by city, measurement error can affect the efficiency of estimation when a city's sample size is too small. To address this, I compute for each city the migrant sample size threshold to infer the city-wide population means at the 90% confidence level given a pre-specified margin of error (MR). I use one-half of the standard deviation of each index as the maximum margin of error. Specifically, the margins of error are set at 0.05 for overall and low-skilled inclusiveness and 0.1 for high-skilled inclusiveness. (See Table 2.3 for the standard deviation for each in-

clusiveness index) This process produces a restricted sample of cities whose migrant sample sizes meets the sample size threshold. I then run additional regressions with this restricted sample of cities as a robustness check of the full-sample analyses.

2.6 Regression analysis

Table 2.6 to Table 2.8 present both the OLS (Eq.2.2) and spatial error model (Eq.2.3) results for overall urban inclusiveness, inclusiveness for high- and low-skilled migrants, respectively. I present results using both the full sample and restricted samples. I report results of three specifications: a baseline specification with all city attributes, baseline plus city size dummies to account for the national policy guideline, and baseline plus city size and province dummies to further account for provincial level policy and fiscal characteristics. I report robust standard errors. Overall, spatial error model yields more robust and consistent estimates than OLS estimation.

Table 2.6 shows that cities with high GRP per capita tend to be more inclusive towards migrants overall. Labor supply from native urban population is not significantly associated with the overall level of inclusiveness. Results are similar when I use working age population as the alternative proxy for local labor supply. After controlling for province fixed effects, I find mega cities are less inclusive. Thus, the national policy guiding urban inclusiveness proposed in 2014 at least reflected, if not caused, mega cities lack of inclusiveness. There is no significant difference among cities in the smaller size categories.

Percentage GRP in the industrial sector is not associated with a city's overall inclusiveness. On the contrary, FDI's share in local economy is positively associated with overall inclusiveness, a consistent finding across models, specifications, and samples. This might indicate cities preference of and subsidies to FDI relative to the industrial sector in general. Cultural openness is positively associated with overall inclusiveness, despite the statistical significance is very marginal, with all t-stats exceeding one. January temperature positively associates with inclusiveness, which perhaps indicates some unobserved southern-northern difference in policy culture instead of the notion that cities with a less amenable climate

might compensate by being more inclusive. Of course, such an effect disappears once I control for province fixed effects. On the other hand, being a coastal city negatively correlates with inclusiveness, supporting the amenity-inclusiveness tradeoff.

Table 2.6: Overall inclusiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (full sample)			OLS (restricted sample)			Spatial Error (full sample)			Spatial Error (restricted sample)		
GRPPC	0.0285**	0.0270*	0.0220+	0.0328***	0.0316**	0.0312**	0.0279**	0.0280**	0.0253*	0.0304**	0.0311**	0.0301**
	(2.82)	(2.54)	(1.86)	(3.40)	(3.20)	(2.95)	(2.66)	(2.60)	(2.36)	(2.97)	(3.04)	(3.01)
POP	-0.00387	-0.00777	-0.00944	0.00123	-0.000784	-0.00335	-0.00361	-0.005	-0.00411	-0.00267	-0.00265	-0.00286
	(-0.45)	(-0.83)	(-0.94)	(0.20)	(-0.11)	(-0.39)	(-0.44)	(-0.55)	(-0.50)	(-0.37)	(-0.32)	(-0.37)
INDUSTRY	-0.0346	-0.0371	-0.0435	-0.00832	-0.00985	-0.0387	-0.0135	-0.0214	-0.0318	-0.0239	-0.0314	-0.0432
	(-0.54)	(-0.58)	(-0.65)	(-0.16)	(-0.18)	(-0.64)	(-0.22)	(-0.34)	(-0.53)	(-0.40)	(-0.52)	(-0.74)
FDI	0.0354***	0.0350***	0.0398***	0.0378***	0.0374***	0.0419***	0.0365***	0.0359***	0.0433***	0.0381***	0.0376***	0.0451***
	(4.72)	(4.53)	(4.23)	(5.16)	(5.05)	(4.81)	(4.24)	(4.17)	(5.31)	(4.55)	(4.51)	(5.70)
CULTURE	0.0225	0.0229	0.0237	0.0286+	0.0301+	0.0319+	0.0242	0.0265	0.0153	0.0300+	0.0330*	0.0228
	(1.33)	(1.33)	(1.26)	(1.75)	(1.80)	(1.80)	(1.39)	(1.51)	(0.91)	(1.80)	(1.96)	(1.39)
JANTEMP	0.00243***	0.00241***	-0.000972	0.00193***	0.00186***	-0.000661	0.00225**	0.00220**	-0.00037	0.00202**	0.00195**	-0.000287
	(3.70)	(3.55)	(-0.59)	(3.71)	(3.59)	(-0.42)	(3.20)	(3.15)	(-0.26)	(3.04)	(2.96)	(-0.20)
COAST	-0.0301+	-0.0309+	-0.0320+	-0.0373**	-0.0364**	-0.0339*	-0.0292+	-0.0283+	-0.0282+	-0.0426**	-0.0411**	-0.0401**
	(-1.96)	(-1.96)	(-1.66)	(-2.89)	(-2.80)	(-2.37)	(-1.71)	(-1.68)	(-1.84)	(-2.99)	(-2.98)	(-3.05)
MEGA		0.0115	-0.0489*		-0.00538	-0.0635**		-0.011	-0.0576**		-0.0219	-0.0643***
		(0.38)	(-2.16)		(-0.20)	(-3.06)		(-0.42)	(-3.01)		(-0.88)	(-3.41)
LARGE		0.0182	-0.00313		0.0068	-0.00911		0.00638	-0.0121		-0.00169	-0.0129
		(1.29)	(-0.20)		(0.51)	(-0.62)		(0.49)	(-0.95)		(-0.13)	(-1.00)
MIDSIZE		0.0123	0.00274		-0.00492	-0.0119		-0.00327	-0.00772		-0.0128	-0.0143
		(0.87)	(0.18)		(-0.46)	(-0.97)		(-0.29)	(-0.68)		(-1.22)	(-1.31)
Constant		-0.0651	0.181	-0.271+	-0.229	-0.0147	-0.138	-0.115	0.0618	-0.177	-0.176	-0.00999
		(-0.32)	(0.84)	(-1.82)	(-1.40)	(-0.08)	(-0.83)	(-0.63)	(0.35)	(-1.15)	(-1.02)	(-0.06)
Province FE	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
rho							0.212**	0.207**	-0.234*	0.222**	0.233**	-0.141
							(2.70)	(2.58)	(-1.96)	(2.71)	(2.85)	(-1.12)
Adj. R2	0.338	0.334	0.406	0.464	0.462	0.527						
Obs.	260	260	260	248	248	248	252	252	252	244	244	244

t statistics based on robust standard errors in parentheses, $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

Table 2.7 are results for the inclusiveness for high-skilled migrants. GRP per capita still positively correlates with high-skilled inclusiveness, although this correlation becomes much weaker with province fixed effect. The impact of urban population on high-skilled inclusiveness is not conclusive, though the estimated effects are generally positive. Furthermore, there is no significant difference across cities in different size categories. As in the previous analysis of general inclusiveness, FDI significantly and positively correlates with inclusiveness for high-skilled migrants. In addition, after controlling for province fixed effect, percentage GRP in the industrial sector positively associates with high-skilled inclusiveness. Cultural openness plays a more significant role in the relationship with high-skilled inclusiveness than with overall inclusiveness. January temperature and coastal location have the same effects on high-skilled inclusiveness as general inclusiveness.

Table 2.7: High-skilled inclusiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (full sample)			OLS (restricted sample)			Spatial Error (full sample)			Spatial Error (restricted sample)		
GRPPC	0.0844**	0.0818**	0.0502	0.131***	0.104**	0.0566	0.0769**	0.0761**	0.0458	0.130***	0.111**	0.0577
	(3.31)	(2.96)	(1.54)	(4.07)	(2.74)	(1.37)	(2.97)	(2.76)	(1.54)	(3.97)	(2.91)	(1.46)
POP	0.00686	-0.000687	0.0212	0.0566*	0.0198	0.0364	0.00942	0.00634	0.0363	0.0735**	0.0468+	0.0481
	(0.37)	(-0.03)	(0.74)	(2.49)	(0.73)	(0.80)	(0.49)	(0.28)	(1.54)	(3.05)	(1.71)	(1.23)
INDUSTRY	0.000235	0.0000511	0.239	0.0935	0.118	0.426+	0.0637	0.0575	0.323+	0.162	0.137	0.538*
	0.00	0.00	(1.29)	(0.58)	(0.70)	(1.92)	(0.37)	(0.33)	(1.88)	(0.92)	(0.79)	(2.39)
FDI	0.0458**	0.0455*	0.0419+	0.0314+	0.0276	0.0677**	0.0536**	0.0531**	0.0515**	0.0383*	0.0308	0.0614**
	(2.73)	(2.60)	(1.93)	(1.68)	(1.44)	(2.96)	(3.03)	(2.94)	(2.87)	(1.96)	(1.60)	(3.04)
CULTURE	0.0860*	0.0843*	0.0831*	0.0796*	0.0850*	0.0802+	0.0809*	0.0817*	0.0805*	0.0702*	0.0788*	0.0715*
	(2.48)	(2.38)	(2.22)	(2.31)	(2.41)	(1.94)	(2.32)	(2.30)	(2.34)	(2.09)	(2.24)	(1.99)
JANTEMP	0.00463**	0.00467**	-0.00203	0.00684***	0.00646**	0.00317	0.00404*	0.00406*	-0.0000862	0.00692**	0.00666**	0.00771
	(2.83)	(2.83)	(-0.43)	(3.49)	(3.24)	(0.54)	(2.30)	(2.32)	(-0.02)	(3.10)	(3.27)	(1.44)
COAST	-0.0670*	-0.0707*	-0.0718+	-0.0568+	-0.0560+	-0.0604	-0.0807*	-0.0817*	-0.0846*	-0.0600+	-0.0518	-0.0476
	(-1.99)	(-2.09)	(-1.74)	(-1.70)	(-1.70)	(-1.03)	(-2.39)	(-2.42)	(-2.50)	(-1.72)	(-1.61)	(-1.05)
MEGA		0.0438	-0.0278		0.128	0.0784		0.0136	-0.0328		0.0686	0.0824
		(0.66)	(-0.42)		(1.48)	(0.79)		(0.21)	(-0.58)		(0.80)	(1.03)
LARGE		0.0401	-0.00798		0.124*	0.0729		0.0171	-0.0194		0.0914	0.0713
		(0.98)	(-0.19)		(2.28)	(1.15)		(0.42)	(-0.53)		(1.56)	(1.44)
MIDSIZE		0.0431	0.0297		0.041	0.059		0.0152	0.0174		0.00299	0.0412
		(1.17)	(0.81)		(0.80)	(1.03)		(0.43)	(0.55)		(0.06)	(0.96)
Constant	-0.707+	-0.6	-0.371	-2.055***	-1.301*	-0.867	-0.695+	-0.652	-0.566	-2.335***	-1.764**	-1.065
	(-1.71)	(-1.31)	(-0.60)	(-4.03)	(-2.07)	(-0.94)	(-1.76)	(-1.43)	(-1.10)	(-5.20)	(-3.00)	(-1.40)
Province FE	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
rho							0.0933	0.0846	-0.374***	0.180**	0.0998	-0.24
							(1.36)	(1.20)	(-3.84)	(2.63)	(1.32)	(-1.50)
Adj. R2	0.229	0.224	0.311	0.355	0.373	0.502						
Obs.	255	255	255	148	148	148	247	247	247	137	137	137

t statistics based on robust standard errors in parentheses, $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

Table 2.8 presents results on the inclusiveness for low-skilled migrants. GRP per capita positively associates with low-skilled inclusiveness, but with an effect much smaller in magnitude than that of high-skilled inclusiveness, suggesting richer cities preference for high-skilled migrants. Controlling for province dummy, urban population negatively correlates with low-skilled inclusiveness, a finding that is marginally significant. On top of that, the coefficients of the mega city dummy are negative and significant when controlling for province fixed effect, suggesting that the discrimination against low-skilled migrants is particularly severe in mega cities, which is consistent with the 2014 National Policy Frame for Hukou Reform. Such results are opposite from what I observe for high-skilled inclusiveness: population positively correlates with inclusiveness for high-skilled migrants, and city size category does not affect inclusiveness for high-skilled migrants, as shown in Table 2.7. Such different effects of population size on the inclusiveness of high- and low- skilled migrants suggest that larger cities tend to be more inclusive towards high-skilled migrants, but bias against low-skilled migrants. Such evidence suggests a more selective process in larger cities, especially mega cities.

Similar to previous findings, FDI positively correlates with inclusiveness level for low-skilled migrants. However, percentage GRP in the overall industrial sector does not increase low-skilled inclusiveness, different from the effect on high-skilled inclusiveness. Cultural openness effect remains positive on low-skilled inclusiveness, but not as large and significant as that of high-skilled inclusiveness. That is, while cultural openness helps urban inclusiveness in general, it enlarges the high- vs. low- skilled gap in cities inclusiveness toward migrants. Estimated effects of January temperature and coastal location are consistent with those for overall and high-skilled inclusiveness indexes.

Table 2.8: Low-skilled inclusiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (full sample)			OLS (restricted sample)			Spatial Error (full sample)			Spatial Error (restricted sample)		
GRPPC	0.0181*	0.0186*	0.0144+	0.0204**	0.0211**	0.0183*	0.0187*	0.0197*	0.0178*	0.0191*	0.0203**	0.0197*
	(2.41)	(2.38)	(1.66)	(2.81)	(2.84)	(2.14)	(2.50)	(2.57)	(2.29)	(2.55)	(2.69)	(2.47)
POP	-0.0103	-0.0116	-0.0162+	-0.00469	-0.0048	-0.0101	-0.00797	-0.00873	-0.0119+	-0.0059	-0.00574	-0.00978
	(-1.46)	(-1.47)	(-1.92)	(-0.95)	(-0.81)	(-1.38)	(-1.27)	(-1.20)	(-1.84)	(-1.09)	(-0.89)	(-1.57)
INDUSTRY	-0.0097	-0.018	-0.0365	0.0149	0.00657	-0.0199	0.00771	-0.00461	-0.0295	0.00783	-0.0032	-0.0287
	(-0.21)	(-0.38)	(-0.69)	(0.40)	(0.17)	(-0.41)	(0.18)	(-0.11)	(-0.65)	(0.19)	(-0.07)	(-0.62)
FDI	0.0386***	0.0383***	0.0427***	0.0400***	0.0398***	0.0441***	0.0397***	0.0392***	0.0463***	0.0408***	0.0404***	0.0472***
	(6.14)	(5.97)	(5.72)	(6.40)	(6.34)	(6.05)	(6.05)	(5.94)	(7.46)	(6.37)	(6.29)	(7.38)
CULTURE	0.0152	0.0176	0.0173	0.0185	0.0219	0.0216	0.0139	0.018	0.00782	0.0181	0.0224+	0.0148
	(1.09)	(1.29)	(1.10)	(1.38)	(1.65)	(1.42)	(0.98)	(1.30)	(0.58)	(1.33)	(1.68)	(1.08)
JANTEMP	0.00195***	0.00193***	-0.000987	0.00147***	0.00141***	-0.00041	0.00177***	0.00173***	-0.000629	0.00157***	0.00151***	-0.000515
	(3.73)	(3.59)	(-0.73)	(3.67)	(3.55)	(-0.32)	(3.76)	(3.70)	(-0.57)	(3.58)	(3.48)	(-0.46)
COAST	-0.0238+	-0.0244+	-0.0253+	-0.0277*	-0.0271*	-0.0285*	-0.0225+	-0.0224+	-0.0216+	-0.0296*	-0.0292*	-0.0302**
	(-1.86)	(-1.90)	(-1.65)	(-2.41)	(-2.43)	(-2.32)	(-1.73)	(-1.77)	(-1.90)	(-2.47)	(-2.55)	(-2.79)
MEGA		-0.00914	-0.0425*		-0.0219	-0.0503**		-0.0196	-0.0447**		-0.0262	-0.0494**
		(-0.41)	(-2.36)		(-1.08)	(-2.81)		(-0.95)	(-2.85)		(-1.35)	(-3.10)
LARGE		0.0134	0.00181		0.00588	-0.00178		0.00783	-0.00564		0.00278	-0.00492
		(1.23)	(0.15)		(0.56)	(-0.15)		(0.76)	(-0.55)		(0.27)	(-0.47)
MIDSIZE		0.00868	0.00318		-0.00399	-0.00792		-0.000907	-0.00489		-0.00729	-0.00873
		(0.77)	(0.26)		(-0.49)	(-0.85)		(-0.10)	(-0.55)		(-0.91)	(-1.02)
Constant	0.0412	0.0513	0.232	-0.0845	-0.0869	0.091	-0.00991	-0.00552	0.12	-0.0488	-0.0556	0.0677
	(0.26)	(0.30)	(1.33)	(-0.71)	(-0.65)	(0.58)	(-0.08)	(-0.04)	(0.87)	(-0.41)	(-0.41)	(0.50)
Province FE	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
rho							0.0471	0.0506	-0.365**	0.0205	0.0372	-0.285+
							(0.49)	(0.50)	(-2.67)	(0.20)	(0.36)	(-1.95)
Adj. R2	0.428	0.427	0.453	0.551	0.554	0.57						
Obs.	260	260	260	251	251	251	252	252	252	244	244	244

t statistics based on robust standard errors in parentheses, $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

I further analyze the inclusiveness gaps between high-and low-skilled migrants across cities in Table 2.9. Both local GRP and urban population positively correlate with inclusiveness gap even after controlling for city's size category, which does not have an independent effect itself. Percentage GRP in the industrial sector positively contributes to inclusiveness gap after controlling for province dummy, while no effect is found by FDI. This might suggest that FDI may has a relatively higher demand for low-skilled labor than the manufacturing sector in general. Alternatively, this might reflect that FDI emphasizes the benefits of low-skilled migrants more relative to domestic industrial employers for other reasons (e.g., international standards in labor practice). Consistent with previous findings, cultural openness surprisingly increases rather than decreases skill-level based migrant selectivity. January temperature enlarges the inclusiveness gap, while coastal location has a negative but generally insignificant effect on the gap. These findings, combined with the previous estimates in Tables 7-8, indicate that high-skilled inclusiveness is more sensitive to January temperature and coastal location, although the effects are in the same directions for low-skilled inclusiveness.

Table 2.9: Inclusiveness gap

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (full sample)			OLS (restricted sample)			Spatial Error (full sample)			Spatial Error (restricted sample)		
GRPPC	0.0694**	0.0667**	0.0401	0.136***	0.114***	0.0703*	0.0628**	0.0605**	0.033	0.116***	0.0976**	0.0458
	(3.17)	(2.82)	(1.35)	(6.05)	(4.25)	(2.16)	(2.88)	(2.61)	(1.23)	(4.12)	(2.96)	(1.33)
POP	0.0188	0.0133	0.0402	0.0617***	0.0343+	0.0570+	0.0195	0.0163	0.0522*	0.0794***	0.0540*	0.0705+
	(1.16)	(0.70)	(1.52)	(4.35)	(1.80)	(1.68)	(1.12)	(0.81)	(2.41)	(3.79)	(2.22)	(1.89)
INDUSTRY	0.000372	0.00793	0.263	0.0378	0.0714	0.384+	0.0326	0.0398	0.339*	0.133	0.127	0.547**
	0.00	(0.06)	(1.55)	(0.33)	(0.61)	(1.97)	(0.21)	(0.26)	(2.14)	(0.90)	(0.87)	(2.69)
FDI	0.00606	0.00613	-0.0000885	-0.0162	-0.0187	0.0167	0.012	0.0121	0.00559	-0.00607	-0.0123	0.0142
	(0.42)	(0.42)	(-0.00)	(-1.17)	(-1.30)	(0.97)	(0.84)	(0.83)	(0.37)	(-0.39)	(-0.79)	(0.77)
CULTURE	0.0663*	0.0621*	0.0595+	0.0556*	0.0569*	0.0484	0.0668*	0.0633*	0.0669*	0.0416	0.0464+	0.0477+
	(2.23)	(2.07)	(1.92)	(2.08)	(2.08)	(1.61)	(2.26)	(2.11)	(2.24)	(1.62)	(1.74)	(1.76)
JANTEMP	0.00261+	0.00267+	-0.00103	0.00484***	0.00454**	0.00362	0.00228	0.00232	0.000785	0.00453*	0.00442**	0.00541
	(1.84)	(1.87)	(-0.23)	(3.45)	(3.28)	(0.69)	(1.56)	(1.60)	(0.21)	(2.55)	(2.62)	(1.05)
COAST	-0.0404	-0.0433	-0.0435	-0.0155	-0.0125	-0.00706	-0.0558*	-0.0570*	-0.0601*	-0.0152	-0.0103	-0.0153
	(-1.41)	(-1.52)	(-1.19)	(-0.55)	(-0.46)	(-0.16)	(-2.06)	(-2.11)	(-1.98)	(-0.52)	(-0.37)	(-0.36)
MEGA		0.0501	0.0124		0.103	0.0935		0.0363	0.00881		0.0845	0.118
		(0.92)	(0.21)		(1.54)	(1.08)		(0.67)	(0.18)		(1.16)	(1.53)
LARGE		0.0243	-0.0125		0.0823+	0.0514		0.0119	-0.0151		0.0758	0.0571
		(0.67)	(-0.33)		(1.87)	(1.08)		(0.33)	(-0.46)		(1.48)	(1.29)
MIDSIZE		0.0335	0.0257		0.0189	0.0415		0.0181	0.0232		0.00651	0.0457
		(1.04)	(0.80)		(0.51)	(1.06)		(0.56)	(0.81)		(0.15)	(1.25)
Constant	-0.803*	-0.719+	-0.697	-2.236***	-1.650***	-1.447+	-0.756*	-0.699+	-0.802+	-2.334***	-1.792***	-1.428*
	(-2.35)	(-1.83)	(-1.23)	(-6.55)	(-3.64)	(-1.94)	(-2.18)	(-1.76)	(-1.70)	(-6.52)	(-3.64)	(-1.99)
Province FE	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
rho							0.0159	0.0147	-0.430***	0.146*	0.0755	-0.144
							(0.22)	(0.20)	(-4.29)	(2.20)	(1.05)	(-0.70)
Adj. R2	0.09	0.083	0.161	0.293	0.306	0.425						
Obs.	255	255	255	146	146	146	247	247	247	137	137	137

t statistics based on robust standard errors in parentheses, $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

2.7 Conclusion

This study uses data on urban migrants social benefits coverage across Chinese cities to construct a composite inclusiveness index as the measure of the inclusiveness of local social services towards migrants. There are great spatial disparities in urban inclusiveness across Chinese cities.

I try to explain such disparities using OLS and spatial regressions. Consistent with our hypotheses, cities with higher GRP per capita or a historical cultural openness tend to be more inclusive. The share of manufacturing in local economy does not affect overall inclusiveness and the inclusiveness for low-skilled migrants, but is positively associated with the inclusiveness for high-skilled migrants. On the other hand, the share of FDI in local economy has a consistent and significant explanatory power to urban inclusiveness, both high- and low-skilled. Larger cities tend to increase high-skilled inclusiveness and decrease low-skilled inclusiveness. In particular, mega cities have significantly lower overall and low-skilled inclusiveness than smaller cities. Finally, cities with larger population, higher GRP per capita, and greater share of industrial sector tend to have larger inclusiveness gap between high- and low-skilled migrants. Cultural openness does not help to reduce this gap.

Overall, economic factors such as local scal capacity and industrial structure are influential, whereas cultural openness only marginally affects urban inclusiveness. I find a strong selectivity based on migrants skill level, especially in larger, richer, and more industrialized cities. Cultural openness does not seem to mitigate such a strong and unanimous preference for high-skilled labor. All the evidence suggests a clear instrumental view on migrants in Chinese urban policies, which is also a direct and inevitable consequence of current growth-oriented development agenda. To achieve more equitable social service provisions across cities and close the welfare gaps between urban natives and migrants, it is necessary to reconsider current policy goals and practices and gear it towards an inclusive development agenda, which entails including the well-being of all social groups into central and local policy-making, as well as the evaluation of local government officials.

CHAPTER 3

Urban inclusiveness, internal migration, and urban development in China

Internal migration is the major source of urban and regional population growth. Migrants with different skills contribute to urban economy in different ways. Among others, high-skilled migrants contribute to urban economy through their skills and positive knowledge-spillovers. Contrary to conventional thinking, labor mobility is not entirely cost-free even within the national border. Local institutions, such as culture or access to local public services, including schools, healthcare, etc., impact rates of cross-city migration, beyond jobs and amenities. Whether and to what extent local institutions moderate the effect of migration on urban economies remain less understood. China has explicit internal migration restrictions and local governments are allowed to determine eligibility for local social services based on one's official local residency. Due to the decentralized financing and provision, cities differ greatly in their coverage of social services to urban migrants. Taking advantage of this cross-city variation, I explore how urban inclusiveness, defined as the extent to which urban migrants could access local social services in destination cities, affects urban economy through influencing the quantity and quality of urban labor supply. I construct an index of inclusiveness towards urban migrants for over 200 Chinese cities. I then use structural equations to model how urban inclusiveness shifts urban agglomeration through affecting migrant labor's utility. I use local cultural openness to instrument for urban inclusiveness so as to address the endogeneity. I find that inclusive cities attract more migrants, especially low-skilled migrants; but inclusiveness of high-skilled migrants benefits urban productivity the most. Importantly, I find no negative impacts of inclusiveness towards low-skilled migrants on urban economy.

3.1 Introduction

Recent debates on immigration policy in U.S. and Europe have triggered a new wave of rethinking the impacts of migration on the economy of host countries/regions. There has been a long line of research on how (im-)migration affects productivity, innovation, or the overall economic performances in destination countries/regions. Among others, there has been a consensus on the positive role of high-skilled migrants, whereas the impacts of low-skilled migrants remain controversial. High-skill migrants have higher productivity and generate more positive externalities to urban economy (Chiswick, 2011; J. Hunt et al., 2010; E. L. Glaeser & Resseger, 2010; Rosenthal & Strange, 2008) ; while low-skilled migrants may substitute low-skilled native labor, drive down wages, and increase urban inequality (Stenning et al., 2006; Dustmann, Glitz, & Frattini, 2008). High-skilled migrants also pay more taxes than the costs of public services they consume, whereas low-skilled migrants may consume more than what they pay for (Wharton, 2016). These arguments and research evidence seem to suggest a skill-based selective migration policy at either national or urban level.

As a counterpart of international immigration, internal migration has received less attention in this new wave of debates. Nevertheless, internal migration is a very important force in urban and regional economy, because 1) its sheer size is much larger than that of international immigrants (Mundial, 2009); 2) most urban/regional population changes, especially changes in human capital stock, occur through internal migration across cities/regions, instead of across national borders (Mundial, 2009); 3) contrary to conventional thinking, internal migration also faces migration barriers, despite to a lesser extent compared with international immigration. Thus, it is important to examine how internal migration exerts influences on urban economy.

Given the importance of cross-city/region migration, particularly those high-skilled migrants, urban and regional scholars have a long history of debates on the key drivers of internal migration, i.e., job-led migration V.S. amenity-led migration, as well as an institutionalist perspective of local attitude/culture. These scholarly debates have profound policy implications since it incentivizes local policy-makers to adopt different policies to attract

labor, especially the talented, in an effort to boost urban economy.

In the U.S. and Europe, internal labor mobility is usually assumed to face no barriers. However, such conventional thinking of entirely cost-free internal migration does not hold in all countries of the world. In China, the residential registration (Hukou) system assigns residency to each resident and eligibilities to many local social benefits are also attached to one' local residency status. Such explicit internal migration restriction imposes high cost to cross-city migration in China. Even in countries without explicit internal migration control, migrants also face institutional barriers such as local attitude towards cultural diversity, land use regulation that raises housing price, or integration programs targeted to immigrants. These barriers either raise or lower the entry and staying cost of cross-city/region migration. However, compared with international immigration and immigration policy, the institutional distortions of migration within the national border and its implications to urban economy are less discussed. Taking advantage of the internal migration restriction in China, this research extends previous research that focuses on the direct impacts of migrants on urban economy, and examines how local migration restrictions moderate the relation between internal migration and urban economy by shifting the quantity and quality of urban migration flow.

The Household registration system in China allows local government to monitor and to control urban migration flow by determining migrants' access to local public services, especially five social insurances [1] and housing provident fund benefits. Such institutional arrangements distort migrants' location choice by altering the migration cost in different destination cities, and further affect the quantity and skill composition of urban labor pool. [2] Using this institutional arrangement, I define urban inclusiveness as the extent to which

[1]Social insurances in China include medical care insurance, pension, unemployment insurance, work injury insurance and maternity insurance. These insurances are usually provided and financed at local level, thus great variations in the coverage of these benefits exist across cities.

[2]Urban migrants in this research is defined as people whose cities of registered residency are different from his current city of residence. According to National Bureau of Statistics in China, internal migrants have reached 18% of the whole population in China in 2013 (National Bureau of Statistics of China, 2013), whereas the National Migration Survey in 2013 suggests among this enormous size of migrants, only 18.14% have pension, 16.66% have medical insurance and 7.89% have unemployment insurance.

local governments allow urban migrants to access local social insurances and housing provident fund across cities. I construct a composite index to measure urban inclusiveness in each city, and explore how this local institution barrier affects equilibrium urban wage and migrant size through distorting the utility of migration. Specifically, I seek to answer two questions. First, do inclusive cities, i.e., cities that provide better access to local social services for urban migrants, attract more migrants? Second, do inclusive cities have higher economic productivity by attracting migrants? To answer these questions, I use a two-sector urban model in a spatial equilibrium framework and derive the corresponding reduced-form equations. I then use regression analysis and instrument variable to test my hypotheses. Based on the estimated coefficients, I recover a rough estimate of the effect of inclusiveness on urban productivity.

Furthermore, instead of focusing on the contribution of high-skilled migrants and innovation alone as most U.S.- and Europe-based research does, I examine the impacts of both high- and low-skilled migrants on the overall economic productivity, and how urban inclusiveness moderates this relation. Assessing migrants' impacts on overall productivity could more comprehensively capture migrants' impacts on the economy, since productivity or efficiency improvement cannot always be sufficiently reflected in innovation or patenting behaviors. In addition, most current claims on the positive contributions of migrants, especially high-skilled migrants, to innovation/productivity/economic growth are in fact highly contingent on the specific migrant profile under consideration, and is mostly based on evidence from the U.S. and major economies in Europe. In the U.S. and other developed economies, the majority of migrants are high-skilled and they concentrate in STEM industries where most innovative activities occur. These qualitative facts naturally produce positive effects of (im-)migration on the economy in empirical analyses. However, evidence elsewhere is quite mixed. For example, controlling for firm characteristics, no effects of share of immigrants, or high-skilled immigrants on innovation is found in New Zealand (Maré, Fabling, & Stillman, 2014). In Italy where most migrants are low-skilled, there's also no impact of share of migrants on patent application (Bratti & Conti, 2017). The existence of such evidence raises doubts to the generalizability of evidence found in the U.S. and other developed economy.

Is the existing evidence highly dependent on the specific industrial structure and migrant profile in the country under study? Can evidence found in these economies be generalized to elsewhere? This research provides a piece of empirical evidence outside the contexts of U.S. or European countries, and examines whether inclusiveness towards migrants could increase local economic productivity. Another distinction with extant research is that my main variable of interest is local inclusive policy, i.e., local migration restriction, instead of migration flow itself. Consequently, instead of instrumenting for migration flow, I directly endogenize migrant population with a two-sector urban model and derive the equilibrium migrant size in cities. This research contributes to current knowledge on the role of local institution on internal migration and urban economy outside the contexts of U.S. and Europe. It also informs local policy-makers of their roles in urban development through attracting and retaining migrant labor.

The rest of the chapter is organized as follows. Section 2 summarizes major theoretical debates and empirical evidence on migrants' impacts on urban economy, and migrants' location choice. Section 3 introduces the conceptualization and methodology. Section 4 presents empirical results. Section 5 concludes the paper.

3.2 Literature Review

Despite less discussed, it is worthwhile to first make a distinction between two types of studies on the economic impacts of migration. Research in urban and regional science often focuses on internal migration, i.e., labor relocation within national border, whereas labor and maroeconomists often focus on the impacts of international immigrants on the economy. These two types of research often share similar theoretical foundations and empirical strategies, but still have nuanced differences.

Different from immigration, internal migration is the major source of urban and regional population growth. It has thus become an important topic in regional science because population growth is usually regarded as the yardstick to measure urban success (E. L. Glaeser, 2008). Compared with international immigration, the size of internal migration is usually

much larger, and it also faces much less migration restriction than their international counterpart do (Mundial, 2009). Urban and regional scholars have long recognized the positive association between urban size and productivity (Ciccone & Hall, 1993; Ciccone & Peri, 2005; Duranton, 2015; Combes, Démurger, & Shi, 2013; Rosenthal & Strange, 2004; Puga, 2010). A related line of research particularly focuses on the relation between international immigration and urban economy. Given the similar theoretical foundations and empirical strategies, I do not make further distinctions between these two types of studies in the literature review. Beyond this, studies on the impacts of (im-)migration on urban economy also differ in the specific outcome variables of interests. One line of research focuses on the impacts of (im-)migration on aggregate economic performances, such as productivity, innovation, or growth; the other line focuses on labor market outcomes. Below I summarize the evidence and potential explanations in each line of literature.

3.2.1 Migration, productivity, innovation, and growth

1) *Evidence*

Studies on the aggregate economic impacts of migration usually have outcome variables such as productivity parameter (measuring productivity), number of patents application (measuring innovation), or per capita GDP growth (measuring growth). The independent variable of interest is usually the migration inflow, especially high-skilled migrants. Most of these studies have found a positive relation between share of high-skilled migrants in the economy and productivity, some of them have identified the causal relation. For example, much empirical evidence has shown that a larger share of high-skilled workers leads to higher nominal wage as well as higher productivity [3] (Chiswick, 2011; Acemoglu, 1998; J. Hunt et al., 2010; Rauch, 1993; E. L. Glaeser, 2000; E. L. Glaeser & Resseger, 2010; Rosenthal & Strange, 2008; Yu, Shen, & Liu, 2015).

In the U.S., Peri et al (2015) find that the inflow of STEM workers driven by H-1B

[3]Productivity is usually measured by the productivity parameter in the production function which captures the endogenous factors that improve efficiency, such as formal and informal institutional arrangements.

visa during 1990-2010 explains up to 30 percent of the productivity growth in U.S. cities (Peri et al., 2015). The skilled and innovative labor force is also the major driver of faster GDP growth (Fernald & Jones, 2014; Peri, 2012; Boubtane et al., 2016). In addition to productivity and GDP, research also shows a positive contribution of high-skilled migrants to innovation, usually proxied by patents applications/citations (Jensen, 2014; J. Hunt & Gauthier-Loiselle, 2010; W. R. Kerr & Lincoln, 2010). However, such positive contributions are not ubiquitous. Some studies find no benefits on innovation from migration. For example, using firm-level data and controlling for firm characteristics, share of immigrants and high-skilled immigrants are found to have no effect on firm-level innovative outcomes in New Zealand (Maré et al., 2014); In Italy, where most migrants are low-skilled, there's also no impact of share of migrants on patent applications (Bratti & Conti, 2017).

Research on migrants' impacts on innovation are also subject to many critiques. First, patents or patent citation measurements cannot capture many productivity-enhancing innovative activities, such as process innovation, organizational and management innovations, etc. Patenting is also a type of self-reported innovative outcomes (Bratti & Conti, 2017; Gagliardi, 2015; Maré et al., 2014). Thus using patents as measurements of innovation may well omit some important productivity improvement brought by migrants, especially subtle knowledge that has long-lasting effects on productivity/competitiveness (Bosetti, Cattaneo, & Verdolini, 2015). Furthermore, the contribution of migrants to urban economy does not limit to R&D related innovation, but also other improvements on overall production technology, through competition, improved efficiency/management, better task specialization, etc. Below I summarize several major explanations to migrants' contribution to the economy.

2) *Mechanisms*

Several major potential mechanisms are proposed to explain the impacts of migration on productivity and innovation,[4] including the sorting of talents and skills (i.e., self-selection), knowledge spillover, and diversity.

Migrants, especially high-skilled migrants, improve productivity or innovation through

[4]Similar mechanisms are proposed to explain productivity, growth, and innovation.

their observed and unobserved talents, abilities, and skills, which supplement with the skills of the existing human capital stock in host cities/countries (J. Hunt et al., 2010). These inherently highly productive migrants self-select and sort into host cities/countries, and contribute to the economy (Saxenian, 2007; Page, 2008; J. Hunt & Gauthier-Loiselle, 2010; Peri, 2007; Saxenian, 2002). For example, in the U.S., migrants dis-proportionally hold degrees in STEM fields where most innovation occurs (J. Hunt & Gauthier-Loiselle, 2010); migrants are also self-selective in unobserved traits, such as intelligence, creativity, risk propensity, entrepreneurship, etc. (Borjas, 1987) ; the younger age structure of migrants in the U.S. is also a key reason of their economic vibrancy, productivity and innovativeness (Gagnon et al., 2014).

Migrants may also have positive spillovers and facilitate mutual learnings in cities. First, migrants increase population size that may spur innovation through the economy of agglomeration and market size (E. L. Glaeser, 1999; Acemoglu & Linn, 2004). Among others, high-skilled migrants are particularly conducive to agglomeration externalities, since knowledge spillover and learning are more intensive among the skilled labor (E. L. Glaeser & Gottlieb, 2009; Lucas, 1988; Mellander & Florida, 2006; Abel, Dey, & Gabe, 2012; R. Florida, Mellander, & Stolarick, 2008). Second, the high mobility of migrants may attenuate knowledge spillover between firms and regions (Simonen & McCann, 2010). Lastly, migrants themselves may also exert positive spillovers on natives' patenting behaviors (J. Hunt & Gauthier-Loiselle, 2010).

In addition to the quantity and skills of migrants, scholars also argue that diversity in cultural backgrounds and ethnicities could benefit technological innovation(i.e., patenting), productivity, and GDP growth (Ottaviano & Peri, 2006; Niebuhr, 2010; Parrotta, Pozzoli, & Pytlikova, 2014; Boubtane et al., 2016). Diversity creates a richer pool of experiences and perspectives that complement with each other in the production process and facilitate new idea diffusions (Bove & Elia, 2017). However, the relation between diversity and economic performance are ambiguous in empirical research, partially due to its potential downside (Alesina & Ferrara, 2005; Bove & Elia, 2017). Diversity may impede cooperation and lead to low productivity since it increases communication cost due to cultural and linguistic

differences; it may also reduce trust and social cohesion, as well as increase conflicts (Alesina & Ferrara, 2005; Bove & Elia, 2017).

(Im-)migration may also exert negative effects on innovation due to its dilution and crowd-out effects. On one hand, large inflow of low-skilled migrants increases the relative supply of cheap labor, decreases the ratio between high- and low-skilled labor, and exerts negative impacts on innovation (Bratti & Conti, 2017). On the other hand, a permanent increase in population due to migration inflow also dilutes the ratio of capital to labor, and negatively impacts long-term GDP per capita (Mankiw, Romer, & Weil, 1992). Migrant inventors may also crowd out native inventors (J. Hunt & Gauthier-Loiselle, 2010). These different forces of migration interact with each other and potentially lead to different empirical results.

3.2.2 Migration and labor market outcomes

In addition to aggregate economic performances, a large body of research focuses on the labor market effects of migration, such as native wage, or the relative wage between high- and low-skill native labor. In other words, this scholarship analyzes the impacts of migrants on overall income/income growth, as well as income distribution. [5]

Before I delve into the wage effects of migration, I first discuss the general labor market conditions of migrants. Evidence from multiple countries/ regions have indicated that migrants and natives do not compete in the same labor market. In the U.S., immigrants are often imperfect substitutes for native-born workers due to linguistic and cultural differences and they are thus not in the same labor market to compete for the same jobs (Wharton, 2016). In OECD countries, immigrants usually fill in jobs that are regarded by native workers as unattractive or lacking career prospects, especially those declining occupations, such as machine operator and maintenance (OECD, 2014). Similarly, in China, due to the existence of Hukou system, urban migrant workers also work in a segregated labor market with natives (Meng & Zhang, 2001).

[5]The impacts of migration on income distribution is usually a dominate force in the political decision-making of (im-)migration policy (Chiswick, 2011).

Now I turn to discuss how natives' wage, and the relative wage between high- and low-skilled natives, i.e., wage inequality in cities, are affected in response to different skill mixtures of migration inflows. The analysis is usually based on traditional exogenous growth theory and "partial equilibrium" in labor market (Peri, 2013). It concentrates on the relative supply of different production factors, e.g., low- and high-skilled labor, and capital input. It has a popular argument that (im-)migrants crowd out and substitute native labor, as well as depress urban wage, and such effects are particularly pronounced for less-educated native workers due to the large share of low-skilled migrants (Stenning et al., 2006; Dustmann et al., 2008). For example, a large relative supply of low-skilled labor among migrants will increase the total relative supply of the low-skilled in the whole urban labor force, which thus depresses the relative wage of low-skilled labor to high-skilled labor, and correspondingly increases the wage of the high-skilled and return to capital. As a result, urban wage inequality will also rise (Chiswick, 2011; Dustmann et al., 2008; Dustmann, Fabbri, Preston, & Wadsworth, 2003; Nathan, 2011). On the contrary, a great share of high-skilled migrants will increase the relative supply of high-skilled labor in the whole urban labor force, depressing wage of high-skilled labor, and increasing the wage of low-skilled labor and return to capital. Naturally, urban wage inequality will decline (Chiswick, 2011). In other words, the compositional effects on urban wage of migration depends on how the relative share of labor with different skills, and capital-labor ratio in the whole urban labor force are altered by influx of migration with different skill mixtures relative to that in the native labor force. Nevertheless, these arguments ignore the endogenous process that migrants benefit urban economy through improving urban agglomeration, such as resource sharing, labor matching, and mutual learning (Duranton, 2015; Ciccone, 2002; Ciccone & Hall, 1993). Furthermore, all these theoretical analyses are "partial equilibrium" and ignore adjustments and responses in other parts of the economy (Peri, 2013). [6] As a result of these complexities, empirical evidence not only finds a very small effect of immigration on native wage and employment at

[6]It has been argued that migrants' inflow to the U.S. did not alter the relative supply of high- and low-skilled labor because immigrants to the U.S. concentrate at the top and the bottom of the schooling distribution, and the overall proportion of college-educated immigrants are similar to that of natives (Peri, 2013).

local/national scale (Longhi, Nijkamp, & Poot, 2006), but also ambiguous signs (Ottaviano & Peri, 2012b; Borjas, 2003). [7]

3.2.3 Other market responses

As mentioned, migration may trigger other market adjustments, which may counteract the partial effects of migration on labor market in general equilibrium (Peri, 2013). Among others, responses from firm investments and job specialization may counteract or boost the potential positive or negative effects of migration. Firms may have two distinct strategies to cope with influx of low-skilled labor. On one hand, firms may be less incentivized to innovate, to invest in skill-intensive production technologies, to adopt new technology more slowly, and to maintain a low capital-labor ratio due to the cheap and abundant low-skilled labor supplied by migrants (Peri, 2012; E. Lewis & Peri, 2015). However, on the other hand, cheap labor supply may also encourage firms to invest more, which lead to increased firm size and number of firms that demand more labor (Ottaviano & Peri, 2012b; Borjas, 2014; Peri, 2013). Such expanded firm investments may offset potential reductions in capital-labor ratio from increased labor supply, and maintain the level of capital-labor ratio and keep wage from falling in the long run (Wharton, 2016).

Even within labor market, migration may trigger micro-scale adjustments such as better skill specializations and a more specialized labor force. For example, lacking of adequate linguistic skills, less-educated migrants tend to occupy more manual-labor-intensive jobs; whereas natives with similar skills may upgrade to job positions that require more linguistic/communication skills and have better payments, such as personal services and sales (Peri & Sparber, 2009). Similarly, high-skilled migrants tend to concentrate in STEM industries where their skills are more transferable; while high-skilled natives may switch to jobs that are more culture- and language-dependent, such as management and media (Peri & Sparber, 2009). Such job upgrading process of natives also reflects that even similar-skilled migrants

[7]Some scholars argue the skill-based wage effects may still hold even if we observe neutral effects of migration on urban wage in empirical analyses, due to the counteracting effects of other forces (E. Lewis & Peri, 2015; Nathan, 2011; Peri, 2012; Meng & Zhang, 2010; Dustmann et al., 2008; Heckman, 2005; Yu et al., 2015; Meng, 2012).

and natives can be complementaries instead of substitutions, and they are not competing exactly in the same niche job market. In addition, with more migrants doing manual jobs, it also generates more jobs for natives that requires communication, coordination and interaction skills. These processes increase both natives' wage as well as the overall productivity (S. P. Kerr & Kerr, 2011; Bosetti et al., 2015).

The function of migration on the economy does not limit to the above mentioned aspects. Most migrants are highly mobile and more responsive to regional economic dynamics, thus they stabilize regional economy by moving out of declining regions and moving into booming areas to smooth local booms and busts (Peri, 2013). Migrants' younger age also improves the overall age structure of population and reduce the age-dependency ratio in destination cities/regions/countries (Gagnon et al., 2014).

Another widespread debate about (im-)migration is their fiscal impacts on receiving regions. Some argue (im-)migration contributes to fiscal revenue since many immigrants pay more taxes over their life time than the costs of public services they consume. However, large concentration of less-educated and low-income immigrants may exert high tax burdens on native residents since these migrants tend to pay less taxes, but consume more public services, especially public education (Wharton, 2016). The fiscal impacts of migration deserve a separate and detailed examination, which is beyond the scope of this research.

In addition, too much in-migration to a city/region may also induce excessive congestion cost that negatively affects productivity, such as longer commuting and higher housing price (Combes, Duranton, & Overman, 2005; Ottaviano & Peri, 2012a, 2006; Saiz, 2003). Some scholars have postulated an inverted-U shaped relationship between per capita real income against city size, implying that migration beyond a threshold may reduce urban productivity (Henderson, 1974; Helsley & Strange, 1990; Duranton & Puga, 2004; Au & Henderson, 2006a, 2006b). Due to page limitation, I only focus on the overall impacts of migration on productivity in this research, and leave the congestion cost of migration for future study.

3.2.4 Migration drivers

The importance of migrants, especially high-skilled migrants, in urban economy has spurred long-lasting interests in understanding labor's location choice across cities, regions, and countries, particularly the mediating factors that attract the talents. Focusing on internal migration, I briefly summarize the key drivers of cross-city migration.

There has been a long history of debates on the relative importance of jobs and amenities in inter-city migration. Amenity-led migration theory argues that people move to places with good amenities, such as nice climate, and the role of amenity becomes more important as income rises (Graves, 1976; Graves & Linneman, 1979; Graves, 1979; Fu & Gabriel, 2012). Scholars have used this line of thinking to explain the rise of American sun-belt cities as having warm weather (and the prevalence of air conditioning) that attracts skilled labor who ultimately contribute to urban growth (Rappaport, 2007). Amenities is not limited to natural amenities, but also include man-made amenities such as varieties in consumption goods, cultural diversity, or even city size itself (E. L. Glaeser, Kolko, & Saiz, 2001; R. L. Florida, 2002; Xing & Zhang, 2013). Very recently, urban tolerance, defined as an open attitude towards cultural diversity, is proposed to explain the concentration of talented young people and urban growth, as it lowers the barrier to entry and conduces to the accumulation of urban human capital (R. Florida, 2004, 2002b, 2002a).

Amenity migration theory is also criticized. On one hand, it would be difficult to explain migration by amenity if amenity is fully capitalized into housing price and wage (Graves & Waldman, 1991). On the other hand, the potential reverse causation between population growth and amenity undermines the validity of using amenity to explain urban growth (Storper & Scott, 2009). Scholars also have raised doubts about the priority of amenity in location choice relative to job opportunities. Job-led migration theory argues that wage differentials and job opportunities are more determinant in attracting people and boosting urban productivity (Storper & Scott, 2009). Others believe amenity-driven theory and job-driven theory are not mutually exclusive in explaining urban migration and the effect of amenities on location choice is usually stronger with low moving cost and high income

(Partridge, 2010). Aiming at resolving the simultaneous relation between urban population, amenity, and productivity, extant research usually adopts a three-sector structural equation that uses housing cost, wage, and amenity together to explain the dynamics of urban population and urban economy (E. L. Glaeser, 2008; E. L. Glaeser & Gottlieb, 2009).

Among these migration studies, the location choice of high-skilled migrants particularly interest scholars given the importance of human capital in urban economy. Many studies have found that the distribution of human capital across cities has been increasingly uneven and such divergence is likely to persist (R. Florida et al., 2008; R. Florida, 2002b; Berry & Glaeser, 2005; Shapiro, 2006; Gyourko, Mayer, & Sinai, 2006). Building upon the conventional amenity- and job- led migration theory, scholars argue that man-made urban amenities, such as restaurants, theaters, museums or a particular urban lifestyle especially attract and retain educated and skilled individuals to cities (E. L. Glaeser et al., 2001; R. Florida, 2004, 2002a, 2002b). An tolerant and open attitude towards migrants also improve urban human capital concentration, especially the creative class, because it lowers the barrier to entry and increases urban diversity (R. Florida, 2004, 2002a, 2002b; Andersson, 1985).

These different explanations of inter-city migration have profound policy implications. Amenity-led migration theory encourages urban policy-makers to create nice amenities to attract the talents and advance urban economy. Urban tolerance argument that emphasizes cultural and attitude factors induce cities to strive to make their cities more artistic and show their tolerance and openness to urban migrants (Andersson, 1985; R. Florida, 2002b; R. Florida & Gates, 2003; T. N. Clark, 2004; E. Glaeser, 2005; Noland, 2005). Followers of job-led migration theory believe that as long as firms are attracted and jobs are created, people will naturally follow in. In next section, I use figures to illustrate the relation between cross-city labor mobility, migrants, and urban economy.

3.3 Method and Model

3.3.1 A conceptualization of urban inclusiveness

In this section, I provide a brief conceptualization of urban inclusiveness in the framework of labor mobility and urban economic development to facilitate subsequent model construction. Defined as a type of formal local institution that measures the coverages of five social insurances and housing provident fund among urban migrants, urban inclusiveness enters migrants' utility function and distort labor mobility. As a result, it alters the quantity and quality of urban labor stock, and further impacts urban economic development. In sum,urban inclusiveness plays as a mediating role in the relation between urban labor stock and urban economy. Figure 1.1 illustrates the relations between migration drivers, urban population and urban economy.

For local labor market, urban inclusiveness shifts the elasticity of labor supply as a barrier to labor mobility. Cities with high inclusiveness level tend to have higher elasticity of labor supply, i.e., flatter slope; cities with low inclusiveness level impose higher cost to labor mobility, thus have lower elasticity of labor supply, i.e., steeper slope. Figure 3.1 and 3.2 characterize two cities with different levels of urban inclusiveness. S_L is the supply of low-skilled labor, and S_H is the supply of high-skilled labor. In both cities, the supply elasticities of low-skilled labor are higher than that of high-skilled labor.

City in Figure 3.1 has higher inclusiveness for both high- and low-skilled migrants, but it also has larger inclusiveness difference between high- and low- skilled migrants. As preliminary study shows, this resembles developed Chinese cities (Hu & Wang, 2017a). On the contrary, city in Figure 3.2 has lower inclusiveness but also smaller inclusiveness gap between high- and low-skilled migrants. Cities with high inclusiveness gap artificially increases the relative supply of high-skilled labor to low-skilled labor; whereas cities with small inclusiveness gap but low inclusiveness level limit the supply of both high- and low- skilled labor, but they also exert less compositional effect on local labor supply. Due to page limitation and the primary focus on productivity, I do not further explore the potential labor market implications of these artificially distorted labor supply curves.

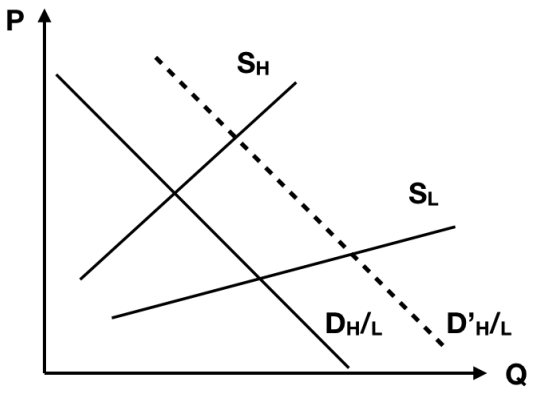

Figure 3.1: Labor market with high inclusiveness and large gap

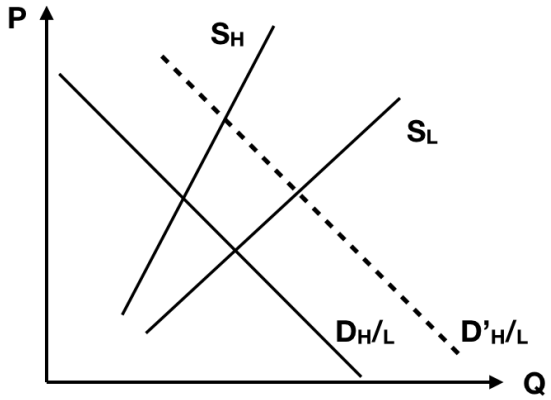

Figure 3.2: Labor market with low inclusiveness and small gap

3.3.2 Method

Two major methodological challenges arise in the identification and estimation of the contribution of urban inclusiveness to productivity. First, urban inclusiveness itself is usually determined by current urban migrant stock and urban economic condition. Thus reverse causation that runs from urban migrant stock or urban economic condition to inclusiveness instead of vice versa might exist. Second, simultaneous relations between urban population, productivity and local price (i.e., housing price) usually exist and bias the estimates. To address the simultaneity, I use a two-sector urban models to endogenize urban population and urban wage. Migration drivers such as differentials in wage, cost of living, and amenities enter migrants utility. In equilibrium, migrants' utilities are maximized in current location and the utility of marginal migrants are equalized across cities. I then instrument for urban inclusiveness to isolate its effect on urban population and productivity.

3.3.3 The urban model

The urban model includes a consumption sector and a production sector. Urban inclusiveness as a local institutional barrier shifts migration cost and enters the migrants' utility function. Instead of explicitly modeling a separate construction market to endogenize housing price, I model housing price as a set of city characteristics following Bayer et al (2009) (Bayer,

Keohane, & Timmins, 2009).

(1) Consumer's problem

I assume the marginal migrant's utility in city j depends on the consumptions of a composite goods(C_j) and housing(H_j). It also obtains (dis-) utility from urban population($\bar{N}_{Nj}$ and N_{Mj}), urban inclusiveness level(I_j), migration cost(M_j) and other urban amenities(X_j). I separate urban native population ($\bar{N}_{Nj}$) and migrant population (N_{Mj}).

$$\max_{C,H} U(C_j, H_j, \bar{N}_{Nj}, N_{Mj}, I_j, M_j, X_j)$$

$$s.t. Cost(C_j, H_j) = w_j$$

The first order condition gives

$$w_j = g_1(p_{Hj}, \bar{N}_{Nj}, N_{Mj}, I_j, M_j, X_j)$$

Specifically, I use a Cobb-Douglas utility function form.

$$\max_{C,H} C_j^{1-\alpha} H_j^{\alpha} exp(\beta_{NN} \ln \bar{N}_{Nj} + \beta_{NM} \ln N_{Mj} + \sum_{k=1}^{K} \beta_k \ln X_{jk} + \beta_I I_j + \beta_M M_j + \varepsilon_j) \quad (3.1)$$

$$s.t. C_j + P_{Hj} H_j = w_j$$

N_j is the total population in city j. The native population $\bar{N}_{Nj}$ is assumed to be constant, N_{Mj} is the number of migrants in city j and $\bar{N}_{Nj} = N_j - N_{Mj}$. By this assumption, the marginal labor in city j in equilibrium will be a migrant and his nominal wage represents the city's productivity.

C_j is composite tradable good consumed by migrant in city j with price of one; H_j is the consumption of non-tradable housing, with a price of p_{Hj}; α is the share of income spent on housing, $\alpha \in (0, 1)$ and is assumed to be constant for every individual in each city; $\bar{N}_{Nj}$ is the total native population in city j, which is assumed to be constant in a fixed period; N_{Mj}

is the total number of migrants in city j; β_{NN} and β_{NM} together capture the aggregate effect of agglomeration on utility: a negative overall effect indicates the dis-utility from congestion outweighs the benefits of agglomeration; X_{jk} are amenities in city j; I_j measures the level of urban inclusiveness towards migrants. M_j is the migration cost of marginal migrant in city j; ε_j is city j's fixed effect, to capture unobserved city characteristics that affect utility; δ_j is an idiosyncratic error term that affects utility. w_j is the marginal migrant's wage in city j. First order condition derives the following reduced form wage equation.

$$\ln(w_j) = U_j + \alpha \ln p_{Hj} - \beta_{NN} \ln \bar{N}_{Nj} - \beta_{NM} \ln N_{Mj} - \sum_{k=1}^{K} \beta_k \ln X_{jk} - \beta_I I_j - \beta_M M_j - \varepsilon_j \tag{3.2}$$

$$U_j \equiv V_j^* - \ln(1-\alpha)^{(1-\alpha)} \alpha^{\alpha}$$

V_j^* is the natural logarithm form of migrants' indirect utility. To close the model, I now turn to the production sector.

(2) Production sector

I assume the city has one fully specialized urban industrial sector that produces tradable goods with inputs of mobile capital and labor in a competitive market. I conceptualize the output function as the following form:

$$Y_j = F(A_j, K_j, \bar{N}_{Nj}, N_{Mj}) \tag{3.3}$$

To capture the agglomeration effect of increased labor, I model urban productivity parameter as a function of urban population stock. I use S_j to indicate human capital in city j.

$$A_j = f(\bar{N}_{Nj}, N_{Mj}, S_j) \tag{3.4}$$

First order condition in output maximization gives the equation for the marginal labor cost, i.e., wage.

$$w_j = g_2(\bar{N}_{Nj}, N_{Mj}, S_j)$$

To be substantive, I use a a Cobb-Douglas form of production function. Labor service is a geometric weighted average of native workers and migrant workers. r is the share of human capital in production, and η is the share of migrant workers in production.

$$Y_j = A_j K_j^{1-r} \bar{N}_{Nj}^{(1-\eta)r} N_{Mj}^{\eta r} \tag{3.5}$$

A_j is a city specific technology parameter that captures agglomeration effect, which is modeled as $A_j = \chi_0 \bar{N}_{Nj}^{\chi_1} N_{Mj}^{\chi_2} S_j^{\chi_3}$. K_j is tradable capital with unit price. First order condition gives the equilibrium wage for marginal migrant.

$$\ln(w_j) = \Theta \ln N_{Mj} + B \ln \bar{N}_{Nj} + Z \ln S + \Omega \tag{3.6}$$

$$\Theta \equiv \frac{\chi_2}{r} + \eta - 2; \quad B \equiv \frac{\chi_1}{r} - \eta + 1; \quad Z \equiv \frac{\chi_3}{r}; \quad \Omega \equiv \ln\left[\chi_0^{\frac{1}{r}} (1-r)^{(\frac{1}{r}-1)} \eta r \chi_2\right]$$

Note that spatial equilibrium condition implies that the marginal productivity of per unit capital K equals unit price. I further insert this constraint to the marginal product of labor and the resultant wage function is thus independent of capital input. Using Eq. (3.2) and Eq. (3.6), I solve the migrant population and wage as follows.

$$\begin{aligned} \ln N_{Mj} = \frac{1}{\Theta + \beta_{NM}} [& U_j + \alpha \ln p_{Hj} - (B + \beta_{NN}) \ln \bar{N}_{Nj} - Z \ln S_j \\ & - \sum_{k=1}^{K} \beta_k \ln X_{jk} - \beta_I I_j - \beta_M M_j - \varepsilon_j - \Omega] \end{aligned} \tag{3.7}$$

$$\begin{aligned} \ln(w_j) = & \frac{\Theta}{\Theta + \beta_{NM}} U_j + \frac{\Theta}{\Theta + \beta_{NM}} \alpha \ln p_{Hj} \\ & + \left(\frac{-(B + \beta_{NN})}{\Theta + \beta_{NM}} + B\right) \ln \bar{N}_{Nj} + \frac{\beta_{NM} * Z}{(\Theta + \beta_{NM})} \ln S_j \\ & + \frac{\Theta}{\Theta + \beta_{NM}} \left[- \sum_{k=1}^{K} \beta_k \ln X_{jk} - \beta_I I_j - \beta_M M_j - \varepsilon_j \right] + \frac{\beta_{NM}}{\Theta + \beta_{NM}} \Omega \end{aligned} \tag{3.8}$$

To recover the effect of migrant population on productivity, I need to identify χ_2. Note that urban inclusiveness I_j is not totally exogenous. Urban economic condition, fiscal capacity, and labor demand can all influence I_j, and correlate with migrant population and urban wage.

I later instrument for urban inclusiveness with an exogenous variable that uncorrelates with factors that associate with migrant size and wage. At this stage, I tentatively use $\bar{I}_j$ to indicate the exogenous component of I_j that is orthogonal to productivity.

M_j intends to capture the long-term migration cost for migrants in city j. In migration literature, M_j usually incorporates the physical cost of migration. Anticipating such physical cost will dissipate over time in the long term, I use M_j to capture the psychological cost of alienation from one's home culture by migrating. I later use linguistic differences to proxy for this migration cost from cultural differences.

Instead of constructing a separate model for housing sector, for simplicity, I use a reduced-form function to endogenize housing price in city j. X_{jk} are variables of urban characteristics that affect urban housing price, ζ_j is the error term that captures the unobserved urban attributes, ζ_k are coefficients of observed urban attributes.

$$\ln p_{Hj} = \sum_{k=1}^{K} \zeta_k \ln X_{jk} + \zeta_j \tag{3.9}$$

Inserting Eq. (3.9) to Eq. (3.7) and Eq. (3.8) yields the following equations.

$$\begin{aligned} \ln N_{Mj} = {} & \frac{1}{\Theta + \beta_{NM}} U_j - \frac{B + \beta_{NN}}{\Theta + \beta_{NM}} \ln \bar{N}_{Nj} - \frac{Z}{(\Theta + \beta_{NM})} \ln S_j \\ & - \frac{1}{\Theta + \beta_{NM}} \sum_{k=1}^{K} \tilde{\beta}_k \ln X_{jk} - \frac{\beta_I}{\Theta + \beta_{NM}} \bar{I}_j - \frac{\beta_M}{\Theta + \beta_{NM}} M_j - \frac{\Omega}{\Theta + \beta_{NM}} - \tilde{\varepsilon}_j \end{aligned} \tag{3.10}$$

$$\begin{aligned} \ln (w_j) = {} & \frac{\Theta}{\Theta + \beta_{NM}} U_j + (\frac{-(B + \beta_{NN})}{\Theta + \beta_{NM}} + B) \ln \bar{N}_{Nj} + [\frac{\beta_{NM} * Z}{(\Theta + \beta_{NM})}] \ln S_j \\ & - \frac{\Theta}{\Theta + \beta_{NM}} \sum_{k=1}^{K} \beta'_k \ln X_{jk} - \frac{\Theta \beta_I}{\Theta + \beta_{NM}} \bar{I}_j - \frac{\Theta \beta_M}{\Theta + \beta_{NM}} M_j + \frac{\beta_{NM}}{\Theta + \beta_{NM}} \Omega - \varepsilon'_j \end{aligned} \tag{3.11}$$

Concise versions of the above functions can be summarized as follows.

$$N_{Mj} = f_1(\bar{N}_{Nj}, S_j, \bar{I}_j, M_j, X_j) \tag{3.12}$$

$$w_j = f_2(\bar{N}_{Nj}, S_j, \bar{I}_j, M_j, X_j) \tag{3.13}$$

The above equations indicate that, the equilibrium wage and migrant stock in city j depends on its current native population, its human capital stock, average migration cost, urban amenities, and urban inclusiveness. Among these factors, native population stock, urban amenities, migration cost, and inclusiveness affects the indirect utility of the marginal migrants, and the share of human capital and native population affects the aggregate urban output. [8]

Rewriting Eq. (3.10) and Eq. (3.11), I have the following empirical specifications.

$$\ln N_{Mj} = \theta_0 + \theta_1 \ln \bar{N}_{Nj} + \theta_2 \ln S_j + \theta_3 \bar{I}_j + \theta_4 M_j + \sum_{k=5}^{K} \theta_k \ln X_{jk} + \varepsilon_j \tag{3.14}$$

$$\ln w_j = \theta_0^* + \theta_1^* \ln \bar{N}_{Nj} + \theta_2^* \ln S_j + \theta_3^* \bar{I}_j + \theta_4^* M_j + \sum_{k=5}^{K} \theta_k^* \ln X_{jk} + \varepsilon_j^* \tag{3.15}$$

Assuming $\bar{I}_j$ is exogenous and using the ratio between the two regression coefficients of $\bar{I}_j$ in Eq. (3.14) and Eq. (3.15), I could identify Θ. Given the values of η and r, I could recover the agglomeration effect of migrant population on production parameter χ_2. According to the specification of the production function, η is the proportion of migrants in city j. r is the share of labor input in production. I use estimates of r in previous studies to identify χ_2.

The next step is to recover the effect of $\bar{I}_j$ on production parameter A_j. Let us assume

$$\ln A_j = \kappa_j + \tau_j \bar{I}_j + \mu_j$$

κ_j is a constant, and μ_j is the error term. τ_j is the total effect of urban inclusiveness on urban productivity parameter A_j

[8] Since the focus of this paper is the productivity of the marginal/representative worker in a city instead of wage, the marginal labor's wage/productivity depends on city-level characteristics, instead of individual characteristics.

Combining this equation with $A_j = \chi_0 \bar{N}_{Nj}^{\chi_1} N_{Mj}^{\chi_2} S_j^{\chi_3}$ yields:

$$\ln N_{Mj} = \frac{\kappa_j - \ln \chi_0}{\chi_2} - \frac{\chi_1}{\chi_2} \ln \bar{N}_{Nj} - \frac{\chi_3}{\chi_2} \ln S_j + \frac{\tau_j}{\chi_2} \bar{I}_j + \tilde{\mu_j} \tag{3.16}$$

Eq. (3.6) and Eq. (3.10)-Eq. (3.15) yields

$$\chi_2 \equiv (\Theta - \eta + 2) * r \equiv (\frac{\theta_3^*}{\theta_3} - \eta + 2) * r \tag{3.17}$$

Given the identified χ_2 and the regression coefficient of $\bar{I}_j$ in Eq. (3.16), i.e. $\frac{\tau_j}{\chi_2}$, I could identify $\tau_j = \frac{\widehat{\tau_j}}{\chi_2} * \chi_2$. It is noteworthy that the effect of inclusiveness on urban productivity parameter A_j, i.e., τ_j, is the product of χ_2, the effect of urban migrants on A_j, and the effect of inclusiveness on urban migrant size, $\frac{\tau_j}{\chi_2}$. In other words, urban inclusiveness affects urban productivity through its influence on urban migrant size. The next section presents the identification strategy, measurements, and data.

3.3.4 Empirical strategy

The causal identification of the effect of urban inclusiveness on productivity depends on its exogeneity. OLS estimates are unbiased only if the error terms in the wage and migrant population equations are uncorrelated with urban inclusiveness. Extant research on the direct effect of migration flow/share on economic growth, productivity, or innovation uses exogenous sources of variations in local migrants supply that do not correlate with productivity-related factors as instrument variables for migrant share. The widely-used instruments include historical migrant share from the same origin or ethnic enclaves (Altonji & Card, 1991; Gagliardi, 2015; J. Hunt & Gauthier-Loiselle, 2010; Peri, 2012; Bosetti et al., 2015; Ottaviano & Peri, 2012b; D'Amuri & Peri, 2014), or imputed share of unskilled migrants (Bosetti et al., 2015; Peri, 2013). Most of these instrument variables are shift-share IVs proposed by Bartik (1991), which is widely used in labor economics as an exogenous instrument for employment/population growth (Jaeger, Ruist, & Stuhler, 2018). In the migrant share setting, these Bartik IVs are the expected regional migrant population growth

assuming migrants of each nationality in that region are growing at the national rate. The idea is that new migrants tend to settle where individuals of the same nationality have already located due to migrants' networks. [9] Despite the validity of exclusion restriction of Bartik IV is often challenged since historical settlement of migrants by origin may also correlate with current economic outcomes, this is still the most widely adopted instrument variable.

In this research, I instrument for urban inclusiveness instead of migrant flow/share. In addition to a baseline OLS estimation, I use a modified Bartik-style instrument for inclusive policy. I predict the expected urban inclusiveness in each city as if it changes in accordance with a national trend. This is equivalent to assuming the expected urban inclusiveness is largely determined by some national-wide policy shifts, and are thus exogenous to local shocks. However, Bartik IV in my setting cannot fully address the potential reverse causality due to the closeness of two study periods. Thereby, I also use an alternative IV as my main analysis. As analyzed in previous chapter, urban inclusiveness is partially determined by local cultural openness, i.e., historical openness to foreign culture. Such historical openness is shown to influence current urban inclusiveness level, and is assumed to be uncorrelated with current economic condition or current migrant stock through other channels due to the length of the time period apart. Therefore, I use culture openness as the main instrument variable for inclusiveness.

3.3.5 Data and measurement

In this research, I use two measurements of urban productivity. One measurement is the nominal wage of marginal labor, i.e., the marginal urban migrant in my context. This measurement is widely adopted in empirical research exploring spatial wage differentials. The rational is that firm will keep hiring labor until its marginal productivity equals labor cost, i.e., nominal wage of the marginal labor. Another measurement is total factor productivity (TFP), i.e., parameter A in the production function. Despite the complex structure, co-

[9] Networks could provide newly arrived individuals with important information about jobs, hospitality, etc.

variates in the reduced-form equations include urban inclusiveness, urban native population, human capital stock, migration cost,and urban amenities. [10] [11]

I use data from the 2013 and 2014 Migrant Population Data conducted by the National Health Commission in China to compute urban inclusiveness. This survey uses a stratified multi-stage probability proportional to size (PPS) scheme to sample (without tracking) around 160,000 urban migrants in over 300 Chinese cities in 31 provinces annually. It contains information on whether the sampled migrants have five social insurances and housing provident fund benefits in destination cities. I construct a composite inclusiveness index with factor analysis to measure the coverage of these social services among urban migrants. I then compute the average urban inclusiveness for each city. Due to the decentralized finance and governance structure, cities have large differences in their inclusiveness towards urban migrants (Hu & Wang, 2017a). I also subgroup migrant sample based on migrants' skills. I define high-skilled migrants as migrants who have bachelor and above degree. I compute urban inclusiveness for high- and low- skilled migrants separately. [12]

Using sampled migrants, I infer average urban inclusiveness, average urban wage, and skill-based migrant size in each city. To reduce the measurement error, I only include cities whose sampled migrant sizes are above certain threshold. The specific confidence interval and margin of error used to compute the thresholds are noted under each table in the following sections. Furthermore, in order to balance measurement error and the sample size of cities in regression analysis, I pool 2013 and 2014 survey data together and obtain a pooled sample. Due to the closeness of these two survey periods, such pooling will not sacrifice data variations to a great extent. By doing this, I expand the sampled migrant size in each city

[10]Migration costs, especially psychological costs that do not dissipate in long time equilibrium, also enter migrants' utility function and affects location choice (Zhao, 2003).

[11]Urban human capital stock affects migration flow due to potential skill substitutability or complementarity.

[12]The Migrant Population Data used in this research has its limitation. It defines migrants as current residents without local Hukou, which excludes migrants from other cities but have already obtained local Hukou in destination cities. Such sample truncation prevents us from fully identifying all urban migrants, especially high-skilled migrants, since many high-skilled migrants have already obtained local residency(Hukou) and become "natives" according to official definition of migrants in China.

so that more cities could meet the sample size thresholds and to be included in empirical analysis.

To measure migration costs, I code the primary language spoken in each migrant's origin and destination province, and create a dummy variable indicating whether they belong to the same language group according to the official classification of Chinese dialects (R. Li, 2012). I assume a different language will raise migration cost. Linguistic differences also imply other cultural differences that result in higher migration cost. Thus linguistic difference could validly proxy for migration cost. As the unit of analysis in this research is city, I compute average migration cost of sampled migrants in each city, i.e., the percentage of migrants with major linguistic differences. Human capital stock is measured as the share of urban population with bachelor and above bachelor degree among working-age population (15-60 years old). Defined as residents with local Hukou, data of native population is from 2010 China Population Census. I also include average January temperature and a dummy variable that indicates whether the city is a coastal city as exogenous measures of urban amenities.

3.4 Empirical Results

3.4.1 Baseline OLS analysis

Table 3.2 presents summary statistics of the key variables in the pooled sample. Average urban inclusiveness for high-skilled migrants is much higher than the average urban inclusiveness for low-skilled migrants, but it also has a larger variation across cities. The average monthly wage of high-skilled migrants is around 3588 yuan and the average monthly wage of low-skilled migrants is around 2882 yuan. The average wage of high-skilled migrants also has a larger standard deviation than that of low-skilled migrants. The size of high-skilled urban migrants in each city is much smaller on average than the size of low-skilled urban migrants. This might due to an artificial sample truncation that many high-skilled migrants have already obtained local Hukou, and are thus excluded from this survey. I use the per-

centage of working-age population with bachelor and above degree to measure urban human capital concentration. On average, only 4% working-age population has bachelor or above bachelor degree. I use the linguistic differences between migrants' provinces of origin and destination to measure migration cost. On average, 30% urban migrants face major linguistic differences. The low share indicates cultural and linguistic differences still impede migration across cities. About 10% of cities in our sample are coastal cities. Since I use a composite index to measure urban inclusiveness, one unit change in urban inclusiveness index bears little practical meaning. Thus, in the following analyses, I focus on the signs of the estimated coefficients, and the relative magnitudes of effect sizes instead of absolute values.

Table 3.3 and Table 3.4 present the OLS regression results for the impacts of urban inclusiveness on overall urban migrant size, and migrant nominal wage. I control for urban native population, current urban human capital stock, migration cost, and natural amenities (e.g., average January Temperature and coastal city) in both migrant size and wage analyses. To avoid the influences of extreme values, I also use median urban migrant wage as a robustness check in addition to the mean values. I use six model specifications to test robustness. The first specification only includes urban inclusiveness; I then include all other regressors except for the coastal dummy; the third column includes all control variables. I then add province fixed effects to these three specifications in column (4) to (6). [13]

As shown in Table 3.3, urban inclusiveness is positively and significantly associated with urban migrant size. Focusing on the specifications in column (4) to (6) with fixed effects, more migrants concentrate in cities with larger size of native population and human capital; migration cost negatively affects migrant size that high migration costs, i.e., large linguistic and cultural differences, lead to smaller migrant size. This implies linguistic differences also inhibit labor mobility within the national border. Controlling for province fixed effects, the effect of natural amenity on migrant size disappears.

Table 3.4 shows regression results of the overall mean and median wage. Column (1) to (6) are results using mean wage as dependent variables; column (7) to (12) are results using

[13]Social insurances are partially financed at province level and some of its variations are attributable to provincial factors, thus I add province fixed effects as controls.

median wage as outcome variables. The orders of model specifications are the same with that in Table 3.3. Overall, urban inclusiveness increases mean and median urban migrant wage, and the results are statistically significant and consistent in all specifications. The size of native population has no effect on nominal wage when adding province fixed effects. As expected, urban human capital concentration positively contributes to nominal mean and median wage. It is surprising that migration costs positively correlate with mean and median migrant wage as well. There are several possible explanations to this. First, migrants with higher migration costs may require higher wage compensations for the psychological costs of living in a place with distinct culture and language; Second, sorting matters. Migrants who are capable of migrating over long distance to a foreign culture may be special and possess higher innate human capital, such as skills, the ability of adaptation, propensities of taking risks, etc. Contrary to expectations, amenities do not contribute to mean and median migrant wage.

I further subgroup migrants based on their skills and explore the relation between inclusiveness, migrant size and wage within each skill group. Table 3.5 suggests that inclusiveness increases the size of both high-and low-skilled migrants, although it has a stronger effect on low-skilled migrant size. This implies urban inclusiveness has higher utilities for low-skilled migrants. Native population size and urban human capital concentration increase both high- and low-skilled migrant size, but the effect size for high-skilled migrants is stronger, implying a strong pulling force of current agglomeration of labor, especially high-skilled labor, towards high-skilled migrants. Such pulling force may be partially due to the effect of skill-complementaries between native population, current human capital stock and high-skilled migrants. Contrary to the results in aggregate migrant size analysis, the associations between migration cost and high- and low- skilled migrant size become insignificant, despite of their negative signs. However, in comparison, migration cost seems to have a stronger influence on the size of low-skilled migrants, either evaluating the effect sizes or their t-statistics. This suggests that, despite the significance of migration cost in overall migrant size, migration cost affects high- and low-skilled migrants differently. The mobility of low-skilled migrants are more constrained by migration cost, mainly cultural and linguistic difference. And as in

the aggregate migrant size analysis, amenities do not influence migrant size significantly.

Table 3.6 and Table 3.7 are skill-based analyses of mean and median wage. Inclusiveness is positively associated with both high- and low- skilled mean and median wage, but it has a stronger impact on high-skilled migrants' wage. This suggests that, despite urban inclusiveness attracts low-skilled migrant to a greater extent, it is the high-skilled migrants benefit more from urban inclusiveness. This corresponds to the theoretical argument that large inflow of low-skilled migrants contribute to wage premium of the high-skilled due to skill complementaries. It might also because high-skilled migrants contribute to urban productivity, i.e., nominal wage, more than low-skilled migrants do, by bringing in higher skills and attenuating agglomeration benefits such as mutual learning. As in the aggregate wage analysis, urban native population stock does not contribute to either mean nor median wage. Current urban human capital stock increases the mean and median wage for high-skilled migrants more than it does for low-skilled migrants. It is possible that high-skilled labor benefits from current human capital agglomeration the most; it is also possible that agglomeration effects gain a strong improvement by absorbing more high-skilled labor. Migration cost also positively correlates with mean and median wage despite it limits labor mobility and reduces migrant size; and similarly, the effect size of migration cost is higher for the mean and median wage of high-skilled migrants. There might be two possible explanations. First, high-skilled migrants may require higher wage compensations for migration; second, high-skilled migrants who endure high migration costs may be more special inherently and have higher productivity. Interestingly, despite no significant effect in aggregate mean and median wage analysis, the effect size of natural amenities on high-skilled mean and median wage are both statistically significant and higher in terms of magnitude. However, Table 3.3 and Table 3.4 suggest no significant effects of natural amenities on urban migrant size, including both high- and low-skilled migrants. This suggests the impacts of natural amenities on wage may not manifest through its influences on migrant size, but through other channels, such as more concentrated productive firms in cities with certain natural amenities. A few previous studies argue that natural amenities attract productive firms more than it do for labor (Lee, 2010; Rickman, 2015).

3.4.2 Regression with predicted inclusiveness

The above OLS analyses are based on a naive measure of urban inclusiveness that is endogenous to both migrant size and wage. In this section, I use instrument variable to address the endogeneity bias. To partially alleviate the endogeneity of urban inclusiveness, I first use a Bartik-style IV, in which I predict urban inclusiveness in 2014 with national average growth rate of inclusiveness between 2013 and 2014. In this case, predicted inclusiveness in 2014 depends on its level in 2013, and a national growth rate that is exogenous to urban economy. This IV could eliminate the revers causation between migrant size, wage, and inclusiveness level in 2014, since urban migrant size or wage in 2014 cannot reversely affect neither inclusiveness in 2013 nor national increases in overall inclusiveness.

Table 3.9 and Table 3.10 are regression results using predicted inclusiveness as IV. In addition to migrant wage, I also include average urban wage for all employees in the metropolitan area and urban districts, regardless of their Hukou status. First-stage results indicate the predicted inclusiveness in 2014 have passed relevance requirement for both high- and low-skilled inclusiveness. Results show urban inclusiveness for high- and low- skilled migrants positively contribute to overall urban wage and urban migrant size, but have no significant effect on migrants' wage.

However, the IV using predicted inclusiveness cannot fully eliminate the endogeneity bias because inclusiveness in 2013 may influence wage in both 2013 and 2014. It cannot eliminate the unobserved factors that persistently correlate with both inclusiveness and wage either. As a result, this IV regression more resembles the baseline OLS results. I thus further use an alternative instrument variable to improve the identification.

3.4.3 IV regression

Previous research indicates that cities that are historically exposed to foreign culture tend to be more inclusive towards migrants since they are more likely to have an open attitude towards cultural diversity (Hu & Wang, 2017a). Moreover, such historical exposures are not likely to affect the current economic productivity in a city given the long period in

between. Thereby, I use whether the city was a treaty port or a foreign concession in late 19th century to measure the city's historical openness, and construct a cultural openness index, i.e., CULTURE. I then use this index to instrument for urban inclusiveness. Table 3.8 shows the summary statistics of the IV regressions. In addition to migrant wage, I also relax the assumption that the marginal labor is a migrant worker and use average monthly wage of all employees in the metropolitan area to indicate the productivity of the marginal worker. As shown in the first two rows of Table 3.8, the average wage of all employees in a city is higher than the average wage of migrants, including the wage of high-skilled migrants.

Table 3.11 is the IV regression results using overall inclusiveness index. First-stage regression in column (1) suggests the satisfaction of relevance requirement. However, we see that the overall urban inclusiveness only positively predicts the average wage of all employees in the metropolitan area very weakly, with t-stats exceeding one, despite its strong association with the total migrant size. I further use CULTURE to instrument for high-skilled inclusiveness in Table 3.12. I find inclusiveness for high-skilled migrants significantly predicts the average wage of all employees, either in the whole metropolitan area or in urban districts. However, its effects on migrant wage, regardless of migrants' skills, are only weakly significant (t-stats exceeding one). There also exists a significantly positive effect of high-skilled inclusiveness on high-skilled migrant size. Table 3.13 shows the IV regression results for low-skilled inclusiveness. Despite the strong predicting power of CULTURE to urban inclusiveness for low-skilled migrants, we do not observe significant effect of low-skilled inclusiveness on the average urban wage or migrants' wage. Interestingly, we see in column (7) that urban inclusiveness has a very strong relation with low-skilled migrants size, which is almost twice as much as the effect size on high-skilled migrant size. IV results suggest that, urban inclusiveness has a much stronger attraction to low-skilled migrants than it does to high-skilled migrants; however, it is the inclusiveness for high-skilled migrants that benefits urban productivity the most.

As a robustness check, I seek alternative IV for inclusiveness. Preliminary research shows that a city's inclusiveness towards migrants largely depends on its fiscal capacity (Hu & Wang, 2017a). In China, one major financial source of social insurances and housing prov-

ident funds are the fees paid by the insured (Ministry of Finance of the PRC, 2015b). The balances of social insurances and housing provident funds thus highly depend on the relative number of payers, who are usually employees, and retirees, who are the major beneficiaries (The Beijing News, 2017). Thus, I use old-age dependency ratio as instrument for inclusiveness. However, preliminary first-stage relevance test indicates that old-age dependency ratio cannot significantly explain inclusiveness for high-skilled labor. This corresponds to our previous finding that fiscal capacity has a lower explanatory power to urban inclusiveness for high-skilled migrants (Hu & Wang, 2017a). Thereby, I only use old-age dependency ratio as an alternative IV for the low-skilled inclusiveness. Similar with my findings using CULTURE as IV, Table 3.14 shows that low-skilled inclusiveness does not contribute to urban wage premium, despite it increases low-skilled migrant size to a great extent.

Based on the IV results, I recover the estimates of urban inclusiveness's effect on productivity parameter A based on Eq. (3.17). The average proportion of migrants in each city, i.e., η, is approximately 0.11 in 2010 census. r is the output elasticity of labor. Following Zheng et al (Zheng, Bigsten, & Hu, 2008; Zheng, Hu, & Bigsten, 2009) , I assume the output elasticity of labor is 0.5. Table 3.1 shows the parameter estimates using the estimated coefficients of overall inclusiveness, inclusiveness for the high-skilled and low-skilled migrants respectively. Here I present all parameter estimates regardless of the statistical significance of the estimated coefficients, but it needs to recall that only θ_3^* for the high-skilled inclusiveness is statistically significant.

Estimates of χ_2 suggest that both high-skilled and low-skilled migrants contribute to urban productivity, that 10% increase in high-skilled migrant size leads to 10% increase in urban productivity parameter, and 10% increase in low-skilled migrant size increases urban productivity by 9.7%. However, since urban inclusiveness has a larger effect on the size of low-skilled migrants, at aggregate level, the increase in urban inclusive index for low-skilled migrants improves urban productivity at a greater extent. An 0.1 unit increase in urban inclusiveness index for the low-skilled migrants increases urban productivity by 143%; whereas the effect of 0.1 unit increase in urban inclusiveness for the high-skilled migrants and all migrants can only increase urban productivity by 51% and 119% respectively. However, de-

Table 3.1: Estimates of inclusiveness' effect on urban productivity

$r = 0.5$; $\eta = 0.11$	θ_3^*	θ_3	Θ	χ_2	τ_j
Overall inclusiveness	0.443	8.077	0.055	0.972	7.854
Inclusiveness for high-skilled migrants	0.502	4.089	0.123	1.006	4.115
Inclusiveness for low-skilled migrants	0.501	9.116	0.055	0.972	8.865

spite the large effect sizes of the τ_j of overall and low-skilled inclusiveness, only the estimated coefficients of high-skilled inclusiveness are statistically different from zero. Thereby, what can be certain is that 0.1 unit increase in urban inclusiveness for the high-skilled migrants raises urban productivity by 51%.

3.5 Conclusion

In this chapter, I examine the effect of local migration restriction, i.e., urban inclusiveness, on urban economic productivity. Due to the decentralized financing and provision, Chinese local governments differ greatly in the extent of allowing urban migrants to access local social insurances and housing provident fund benefits. Taking advantage of such cross-city variations, I define urban inclusiveness as the extent to which urban migrants could access local social insurances and housing provident fund benefits, and conceptualize it as a local migration restriction that impede labor mobility. Inclusive cities have a lower entry and staying cost for urban migrants. Theoretically, urban inclusiveness distorts the indirect utility of migration, and change the quantity and quality of urban labor stock, which ultimately affects urban agglomeration and productivity. Specifically, I seek to understand two questions. First, do inclusive cities attract more migrants? Second, are inclusive cities more productive?

Baseline OLS analyses indicate significant and positive associations between urban inclusiveness, urban migrant size, and urban nominal wage. Such relations are significant and robust across all skill groups, controlling for amenity, native population, migration cost and current human capital stock. To address the endogeneity bias of urban inclusiveness, I use structural equations and instrument variable. I use the historical openness in a city to

instrument for urban inclusiveness. I find inclusive cities attract more migrants, especially low-skilled migrants. The effect size of urban inclusiveness on low-skilled migrant size is twice as much as the effect size on high-skilled migrant size. I find the overall urban inclusiveness does not positively affect urban economic productivity, but urban inclusiveness for high-skilled migrants increases the average urban wage as well as migrant wage. More importantly, it also has a sizable effect on productivity. A 0.1 unit increase in urban inclusiveness for the high-skilled migrants increases urban productivity by 51%. I did not find significant contribution of inclusiveness towards low-skilled migrants on urban wage. Despite this, I did not find any negative effect of low-skilled inclusiveness either. This echoes with evidence found in the U.S. that inflow of low-skilled migrants does not reduce job/ wage for native-born Americans.

I provide a few figures in the Appendix to depict the profiles of Chinese urban migrants. I find that despite their relatively younger age, most Chinese urban migrants are less-educated, work in small business, local service and manufacturing industries. Most of the start-ups of urban migrants also concentrate in small business and local services. These facts may partially attribute to the truncated nature of the migration survey in China, which excludes most high-skilled migrants who have already obtained Hukou. However, such migrants' profiling also explains my empirical finding that little effect of overall inclusiveness exists on urban wage, given the majority of low-skilled migrants. My findings also confirm previous research that suggests Chinese cities are below their optimal size due to migration restrictions (Au & Henderson, 2006a). This implies further inclusion of urban migrants, especially skilled-migrants, could still benefit urban economy even accounting for potential negative effects induced by more population. This research informs Chinese local policy-makers that the inclusion of migrants and increasing labor mobility by releasing Hukou restriction may be conducive to urban economy, especially in the long term.

3.6 Appendix

3.6.1 Tables

Table 3.2: Summary statistics

Variable	Definition	Mean	Median	S.D
Inclusiveness [a]		Obs=269		
AVG_INC	Average inclusiveness index; An index created with factor analysis to measure the coverages of five social insurances and housing provident funds among urban migrants; Average inclusiveness is the mean inclusiveness in each city;	0.1	0.07	0.09
AVG_INC_HIGH	Average inclusiveness of high-skilled migrants, i.e., migrants with bachelor and above degree	0.3	0.29	0.2
AVG_INC_LOW	Average inclusiveness of low-skilled migrants, i.e., migrants with below bachelor degree	0.07	0.05	0.07
Wage [a]				
AVG_WAGE	Average wage of urban migrants, high- and low- skilled migrants (yuan)	2957	2964	742
AVG_WAGE_HIGH		3588	3450	1357
AVG_WAGE_LOW		2882	2896	737
MED_WAGE	Median wage of urban migrant, high- and low- skilled migrant (yuan)	2427	2500	471
MED_WAGE_HIGH		2953	3000	814
MED_WAGE_LOW		2384	2500	467
Population [a,b]				
MIG_SIZE10	Urban migrant size in 2010 population census (thousands)	580	201	1156
MIG_SIZE_HIGH10	High- and low- skilled migrant size in 2010 population census (thousands; imputed value) High- (low-) skilled migrant size= high-(low-)skilled migrant share * total urban migrant size in 2010 population census. High- and (low-)skilled migrant share is computed from migrant sample in National Migrant Survey.	68	19	197
MIG_SIZE_LOW10		513	178	981
NA_POP	Native population in 2010 census (thousands); defined as urban population who has local Hukou in 2010 census.	4363	3716	3102
HUMAN_CAP	Percentage of total urban population with bachelor or above degrees among working age (15-64) population in 2010 Population Census	0.04	0.03	0.03
MIG_COST [c]	Percentage of migrants whose native dialects have major differences with dialects spoken in destination province.[f]	0.3	0.18	0.27
JAN_TEMP [d]	Average January Temperature from 1981 to 2010. (°C)	1.54	3.7	8.67
COASTAL [e]	Dummy variable to indicate whether the city is a coastal city; Yes=1, 0 otherwise	0.1	0	0.3

Source: a. National Migrant Survey data in 2013 and 2014;
b. 2010 Population Census in China;
c. Language atlas of China.2012. Beijing: Commercial Press;
d. China Meteorological Data Service Center, http://data.cma.cn/en;
e. China's History in Maps; http://worldmap.harvard.edu/maps/china-history.
f. We categorize Chinese dialects into 11 supergroup.
Dialects belong to different supergroups are considered as having major differences.
The average of the differences (percentage) is used to measure average migration cost.

Table 3.3: Overall migrant size regression

LN(MIG_SIZE10)	(1)	(2)	(3)	(4)	(5)	(6)
AVG_INC	7.999***	3.107***	3.041***	4.491***	1.912*	1.967*
	(8.27)	(3.75)	(3.62)	(4.73)	(2.27)	(2.30)
LNA_POP		0.555***	0.567***		0.599***	0.615***
		(9.51)	(9.85)		(10.17)	(10.52)
HUMAN_CAP		20.91***	20.25***		19.68***	19.34***
		(12.74)	(12.82)		(11.45)	(11.57)
MIG_COST		1.018***	0.930***		-0.841*	-0.854*
		(5.82)	(5.61)		(-2.49)	(-2.56)
JAN_TEMP		0.00298	0.000819		0.0162	0.0112
		(0.65)	(0.18)		(1.00)	(0.69)
COASTAL (Yes=1)			0.446**			0.27
			(2.86)			(1.55)
Constant	11.56***	2.582**	2.416**	14.46***	1.022	0.798
	(130.26)	(2.95)	(2.81)	(52.42)	(1.12)	(0.89)
Observations	304	262	262	304	262	262
Adjusted R2	0.27	0.707	0.717	0.424	0.786	0.788
Province fixed effect	NO	NO	NO	YES	YES	YES

t statistics in parentheses; $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$
Note: samples only include cities whose sample migrant sizes are above the sample size threshold to infer average inclusiveness, with a 0.05 margin of error and 90% confidence interval.

Table 3.4: Overall mean wage and median wage regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	LN(AVG_WAGE)						LN(MED_WAGE)					
AVG_INC	0.908***	0.408**	0.411**	0.504***	0.527***	0.518***	0.803***	0.303*	0.301*	0.281*	0.326**	0.321**
	(7.34)	(3.24)	(3.28)	(4.41)	(4.59)	(4.45)	(7.12)	(2.38)	(2.37)	(2.55)	(2.89)	(2.82)
LNA_POP		0.0174	0.0166		0.0193	0.0175		0.0345*	0.0348*		0.0224	0.0208
		(1.09)	(1.03)		(1.22)	(1.10)		(2.13)	(2.11)		(1.31)	(1.19)
HUMAN_CAP		1.002***	1.044***		0.901**	0.934**		0.862**	0.846**		0.884*	0.917**
		(3.77)	(3.81)		(2.83)	(2.92)		(3.30)	(3.12)		(2.56)	(2.62)
MIG_COST		0.125**	0.131**		0.501***	0.503***		0.148***	0.146***		0.479***	0.480***
		(3.18)	(3.19)		(4.40)	(4.43)		(3.62)	(3.46)		(3.51)	(3.52)
JAN_TEMP		0.00639***	0.00654***		0.0026	0.00313		0.00570***	0.00565***		0.00425	0.00474
		(4.56)	(4.58)		(0.63)	(0.75)		(4.02)	(3.89)		(0.98)	(1.07)
COASTAL			-0.0283			-0.0261			0.0108			-0.0263
			(-1.05)			(-0.85)			(0.38)			(-0.96)
Constant	7.843***	7.547***	7.558***	8.200***	7.600***	7.626***	7.689***	7.138***	7.134***	7.925***	7.281***	7.303***
	(432.28)	(31.04)	(30.92)	(247.35)	(31.51)	(31.23)	(452.61)	(29.21)	(28.79)	(247.86)	(28.94)	(28.51)
Observations	310	241	241	301	241	241	341	262	262	332	262	262
Adjusted R2	0.127	0.283	0.282	0.409	0.52	0.519	0.093	0.227	0.224	0.37	0.428	0.427
Province fixed effect	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES

t statistics in parentheses, + p <0.10, * p <0.05, ** p <0.01, *** p <0.001

Note: samples only include cities whose migrant sizes are above the following sample size thresholds: 1) the required sample size to infer average urban inclusiveness, with a 90% confidence interval and a 0.05 margin of error; 2) the required sample size to infer average urban migrant wage, with a 90% confidence interval and 500(yuan) margin of error.

Table 3.5: Skill-based migrant size regression

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	LN(MIG_SIZE_HIGH10)						LN(MIG_SIZE_LOW10)					
AVG_INC_HIGH	6.212***	2.756***	2.752***	3.822***	2.168***	2.195***						
	(10.29)	(7.27)	(7.21)	(4.64)	(4.95)	(4.84)						
AVG_INC_LOW							10.43***	4.865***	4.766***	4.161**	2.862*	2.912*
							(7.90)	(4.05)	(3.77)	(2.72)	(2.04)	(2.00)
LNA_POP		0.664***	0.673***		0.812***	0.828***		0.558***	0.566***		0.696***	0.712***
		(8.34)	(8.46)		(6.08)	(6.20)		(8.18)	(8.32)		(6.87)	(7.05)
HUMAN_CAP		20.40***	20.13***		19.35***	19.17***		16.40***	16.18***		14.49***	14.29***
		(11.11)	(11.25)		(6.81)	(6.89)		(10.06)	(10.20)		(7.11)	(7.22)
MIG_COST		0.634*	0.580*		-0.111	-0.182		1.110***	1.061***		-0.642	-0.714
		(2.59)	(2.33)		(-0.14)	(-0.22)		(5.49)	(5.39)		(-1.22)	(-1.35)
JAN_TEMP		0.0218*	0.0198*		-0.00587	-0.00935		0.00497	0.00332		-0.012	-0.0152
		(2.46)	(2.27)		(-0.22)	(-0.35)		(0.79)	(0.53)		(-0.60)	(-0.76)
COASTAL			0.192			0.124			0.195			0.139
			(0.93)			(0.41)			(1.09)			(0.60)
Constant	8.426***	-1.748	-1.868	11.94***	-4.785*	-5.030*	11.84***	2.775**	2.663**	14.81***	0.277	0.0535
	(38.63)	(-1.51)	(-1.61)	(22.03)	(-2.52)	(-2.61)	(96.57)	(2.77)	(2.66)	(62.43)	(0.19)	(0.04)
Observations	139	121	121	139	121	121	174	149	149	174	149	149
Adjusted R2	0.478	0.824	0.824	0.584	0.839	0.838	0.326	0.731	0.732	0.48	0.794	0.793
Province fixed effect	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES

t statistics in parentheses; + p <0.10, * p <0.05, ** p <0.01, *** p <0.001

Note: a. High-skilled migrant size is computed based on the population proportion of high-skilled migrant inferred from migrant sample in each city.
b. Samples only include cities whose migrant sizes are above the following sample size thresholds: 1) the required sample size to infer the population proportion of high-skilled migrant, with 90% confidence interval, a 0.05 margin of error, and a 0.5 ex-ante estimate of population proportion for high-skilled migrant; 2) the required sample size to infer average high- or low-skilled inclusiveness. For high-skilled inclusiveness, we choose a 90% confidence interval, and a 0.1 margin of error given its higher standard deviation; for low-skilled labor, we choose a 90% confidence interval and a 0.05 margin of error.

Table 3.6: Skilled-based mean wage regression

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	LN(AVG_WAGE_HIGH)						LN(AVG_WAGE_LOW)					
AVG_INC_HIGH	0.707***	0.635***	0.634***	0.584***	0.691***	0.693***						
	(5.51)	(5.65)	(5.63)	(4.15)	(5.38)	(5.38)						
AVG_INC_LOW							0.942***	0.270+	0.284+	0.442**	0.462***	0.452***
							(6.90)	(1.83)	(1.95)	(3.24)	(3.52)	(3.38)
LN(NA_POP)		0.00905	0.00921		0.0128	0.0137		0.0127	0.0117		0.0191	0.0165
		(0.38)	(0.38)		(0.43)	(0.45)		(0.78)	(0.71)		(1.19)	(1.02)
HUMAN_CAP		1.569***	1.554***		1.595**	1.585**		0.916***	0.964***		0.905**	0.954**
		(4.07)	(4.00)		(3.08)	(3.03)		(3.64)	(3.71)		(2.81)	(2.96)
MIG_COST		0.258***	0.255***		0.593***	0.592***		0.119**	0.126**		0.504***	0.507***
		(4.81)	(4.64)		(3.61)	(3.55)		(2.96)	(3.02)		(4.45)	(4.51)
JAN_TEMP		0.00224	0.00217		0.0159**	0.0155*		0.00762***	0.00779***		0.00417	0.00502
		(1.04)	(0.99)		(2.63)	(2.50)		(4.94)	(5.00)		(0.97)	(1.16)
COASTAL			0.00999			0.0149			-0.0374			-0.0423
			(0.24)			(0.25)			(-1.45)			(-1.40)
Constant	7.885***	7.621***	7.620***	8.392***	7.718***	7.702***	7.839***	7.617***	7.631***	8.058***	7.470***	7.506***
	(179.36)	(21.54)	(21.40)	(90.77)	(16.61)	(16.36)	(463.81)	(30.90)	(30.89)	(381.01)	(30.36)	(30.19)
Observations	165	135	135	161	135	135	315	243	243	305	243	243
Adjusted R2	0.299	0.487	0.483	0.434	0.611	0.608	0.09	0.261	0.262	0.384	0.51	0.511
Province fixed effect	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES

t statistics in parentheses; + p <0.10, * p <0.05, ** p <0.01, *** p <0.001

Note: Samples only include cities whose migrant sizes are above the following sample size thresholds: 1) the required sample size to infer average high- or low-skilled inclusiveness. For high-skilled inclusiveness, we choose a 90% confidence interval, and a 0.1 margin of error given its higher standard deviation; for low-skilled inclusiveness, we choose a 90% confidence interval and a 0.05 margin of error; 2) the required sample size to infer average wage of high- or low- skilled migrant. For high-skilled average wage, we choose a 90% confidence interval and a 1000 (yuan) margin of error given its higher standard deviation. For low-skilled average wage, we choose a 90% confidence interval and a 500 (yuan) margin of error.

Table 3.7: Skilled-based median wage regression

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	LN(MED_WAGE_HIGH)						LN(MED_LOW)					
AVG_INC_HIGH	0.319***	0.237+	0.236+	0.268*	0.391**	0.392**						
	(3.36)	(1.95)	(1.94)	(2.12)	(2.82)	(2.82)						
AVG_INC_LOW							0.976***	0.291+	0.287+	0.298*	0.307*	0.302*
							(7.00)	(1.88)	(1.86)	(2.16)	(2.45)	(2.39)
LN(NA_POP)		-0.000304	0.00037		0.000392	0.00242		0.0301+	0.0303+		0.0148	0.0128
		(-0.02)	(0.02)		(0.01)	(0.08)		(1.78)	(1.77)		(0.88)	(0.75)
HUMAN_CAP		1.078*	1.051*		1.446**	1.433*		0.899***	0.888**		0.921**	0.962**
		(2.53)	(2.38)		(2.65)	(2.59)		(3.40)	(3.25)		(2.63)	(2.72)
MIG_COST		0.289***	0.285***		0.912***	0.911***		0.154***	0.152***		0.502***	0.504***
		(4.67)	(4.35)		(4.60)	(4.58)		(3.65)	(3.52)		(3.71)	(3.73)
JAN_TEMP		0.001	0.000873		0.0194+	0.0189+		0.00642***	0.00639***		0.00466	0.0053
		(0.36)	(0.30)		(1.93)	(1.80)		(4.36)	(4.26)		(1.10)	(1.23)
COASTAL			0.0198			0.0235			0.00853			-0.035
			(0.34)			(0.36)			(0.30)			(-1.25)
Constant	7.888***	7.784***	7.775***	8.341***	7.860***	7.827***	7.677***	7.189***	7.186***	7.891***	7.374***	7.401***
	(213.80)	(25.87)	(25.49)	(100.46)	(16.18)	(15.88)	(481.14)	(28.38)	(28.06)	(368.66)	(30.29)	(29.95)
Observations	204	163	163	199	163	163	345	263	263	335	263	263
Adjusted R2	0.066	0.152	0.147	0.175	0.331	0.326	0.088	0.232	0.229	0.375	0.454	0.453
Province fixed effect	NO	NO	NO	YES	YES	YES	NO	NO	NO	YES	YES	YES

t statistics in parentheses; + p <0.10, * p <0.05, ** p <0.01, *** p <0.001

Note: Samples only include cities whose migrant sizes are above the required sample size to infer average high- or low-skilled inclusiveness.
For high-skilled inclusiveness, we choose a 90% confidence interval, and a 0.1 margin of error given its higher standard deviation;
for low-skilled inclusiveness, we choose a 90% confidence interval and a 0.05 margin of error.

Table 3.8: Summary statistics in IV regression

Variable	Definition	Mean	Median	S.D.	Min	Max
		Obs=268				
AVG_WAGE_TL	Average monthly wage in metropolitan area (All employees)	3917.462	3780.209	811.2855	2520.775	8224.883
AVG_WAGE_CI	Average monthly wage in urban districts (All employees)	4171.779	4002.526	876.065	2557.188	9227.898
AVG_WAGE	Average monthly wage of migrants	2953.987	2959.799	741.743	1524.87	10577.14
AVG_WAGE_HIGH	Average monthly wage of high-skilled migrants	3585.535	3449.167	1358.861	1125	17150
AVG_WAGE_LOW	Average monthly wage of low-skilled migrants	2879.173	2887.758	737.285	1491.936	10814.71
CULTURE	Cultural openness, whether the city was a treaty port or foreign concession in late 19th century	0.107	0	0.273	0	1.022

Table 3.9: Regression for high-skilled migrants with predicted inclusiveness

	First stage	(1) LN(AVG_WAGE_TL)	(2) LN(AVG_WAGE_CI)	(3) LN(AVG_WAGE)	(4) LN(AVG_WAGE_HIGH)	(5) LN(AVG_WAGE_LOW)	(6) LN(MIG_SIZE_HIGH)
INC_HIGH		**0.398*** **	**0.360** **	**-0.00609**	**0.260**	**-0.106**	**4.209*** **
		(4.17)	**(3.06)**	**(-0.05)**	**(1.20)**	**(-0.85)**	**(7.26)**
LNA_POP	0.00727	-0.0292+	-0.00750	-0.00613	-0.0177	-0.0141	0.187+
	(0.483)	(-1.80)	(-0.26)	(-0.36)	(-0.62)	(-0.81)	(1.71)
HUMAN_CAP	0.892***	2.810***	2.555***	0.900*	1.319*	0.903*	20.40***
	(4.379)	(8.23)	(6.57)	(2.09)	(2.56)	(2.17)	(8.78)
MIG_COST	-0.0115	0.103	0.116	0.207*	0.203	0.212*	-0.0217
	(-0.262)	(1.32)	(1.25)	(2.20)	(1.61)	(2.01)	(-0.07)
JAN_TEMP	0.00140	-0.00324	-0.00224	0.00779*	0.00689*	0.00862*	-0.00804
	(0.981)	(-1.60)	(-0.88)	(2.52)	(1.97)	(2.37)	(-0.75)
COSTAL	0.0111	0.0311	0.0239	-0.0484+	-0.00610	-0.0465+	-0.115
	(0.397)	(1.33)	(0.69)	(-1.69)	(-0.12)	(-1.68)	(-0.37)
P_INC_HIGH	**0.675*** **						
	(12.19)						
Constant	-0.0634	8.488***	8.230***	8.013***	8.236***	8.127***	-1.540
	(-0.291)	(34.31)	(19.04)	(30.63)	(19.83)	(31.11)	(-0.97)
Observations	158	156	154	158	158	158	158
Adjusted R-squared	0.673	0.603	0.424	0.168	0.105	0.179	0.690

t statistics in parentheses; =”+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001”

Table 3.10: Regression for low-skilled migrants with predicted inclusiveness

		(1)	(2)	(3)	(4)	(5)	(6)
	First stage	LN(AVG_WAGE_TL)	LN(AVG_WAGE_CI)	LN(AVG_WAGE)	LN(AVG_WAGE_HIGH)	LN(AVG_WAGE_LOW)	LN(MIG_SIZE_LOW)
INC_LOW		**0.840*** **	**0.707***	**0.00885**	**0.372**	**-0.0950**	**3.928***
		(3.82)	**(2.55)**	**(0.03)**	**(0.78)**	**(-0.33)**	**(2.54)**
LNA_POP	0.00308	-0.0221	-0.00126	0.0102	-0.0246	0.00579	0.0648
	(0.862)	(-1.56)	(-0.06)	(0.49)	(-1.05)	(0.28)	(0.70)
HUMAN_CAP	0.251***	3.393***	3.102***	1.199**	2.067***	0.952*	24.68***
	(3.015)	(12.55)	(10.80)	(3.01)	(4.57)	(2.56)	(12.51)
MIG_COST	0.00334	0.110*	0.137*	0.201*	0.234*	0.204*	0.575*
	(0.240)	(1.96)	(2.33)	(2.22)	(2.03)	(2.14)	(2.23)
JAN_TEMP	0.000653*	-0.000467	0.0000569	0.00785*	0.00513+	0.00853*	-0.00409
	(1.723)	(-0.28)	(0.04)	(2.50)	(1.79)	(2.57)	(-0.49)
COSTAL	0.0163	-0.00383	-0.0238	-0.0411	0.0309	-0.0439	0.00244
	(1.393)	(-0.12)	(-0.73)	(-1.43)	(0.71)	(-1.55)	(0.01)
P_INC_LOW	**0.590*** **						
	(7.154)						
Constant	-0.0333	8.394***	8.154***	7.729***	8.319***	7.785***	2.738*
	(-0.634)	(39.03)	(26.50)	(23.86)	(22.47)	(24.68)	(1.99)
Observations	263	261	259	263	259	263	263
Adjusted R-squared	0.544	0.544	0.431	0.175	0.103	0.178	0.492

t statistics in parentheses; =”+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001”

Table 3.11: IV regression on overall inclusiveness index

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	First Stage	LN(Average wage)					LN(MIG_SIZE)
		Metropolitan Area	Urban District	Migrant	High-skilled migrants	Low-skilled migrants	
AVG_INC		0.443	0.357	-0.0411	0.526	0.00351	8.077**
		(1.14)	(0.83)	(-0.09)	(0.93)	(0.01)	(2.65)
LNA_POP	-0.00146	-0.0263*	-0.0138	0.0216	-0.0165	0.0189	0.0996
	(-0.246)	(-2.00)	(-0.70)	(1.41)	(-0.94)	(1.20)	(0.80)
HUMAN_CAP	0.634***	3.503***	3.226***	0.912+	1.704*	0.566	20.14***
	(3.99)	(8.90)	(7.00)	(1.67)	(2.53)	(1.27)	(5.47)
MIG_COST	0.0351*	0.132*	0.147*	0.113	0.223*	0.105	0.288
	(1.92)	(2.15)	(2.32)	(1.47)	(2.09)	(1.30)	(0.54)
JAN_TEMP	0.00322***	-0.000618	0.0000333	0.00858***	0.00452	0.00849***	-0.0189
	(5.23)	(-0.26)	(0.01)	(3.52)	(1.11)	(3.63)	(-1.25)
COASTAL	-0.00504	0.0153	-0.00386	-0.0430+	0.00646	-0.0470+	0.0384
	(-0.285)	(0.56)	(-0.12)	(-1.75)	(0.19)	(-1.93)	(0.15)
CULTURE	0.0721***						
	(3.43)						
Constant	0.0669	10.91***	10.80***	7.563***	8.183***	7.594***	2.886
	(0.75)	(54.61)	(36.22)	(31.72)	(29.44)	(31.27)	(1.56)
Observations	262	262	261	262	262	262	262
Adjusted R-squared	0.31	0.542	0.447	0.155	0.122	0.148	0.451
F-stats	17.93						

Clustered t statistics in parentheses. + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

Table 3.12: IV regression on inclusiveness index for high-skilled migrants

Variable	(1) First Stage	(2)	(3)	(4)	(5)	(6)	(7)
		LN (Average wage)					LN(MIG_SIZE_HIGH)
		Metropolitan Area	Urban District	Migrant	High-skilled migrants	Low-skilled migrants	
AVG_INC_HIGH		0.502*	0.514*	0.27	0.441	0.301	4.089*
		(2.02)	(2.08)	(1.24)	(1.62)	(1.53)	(2.22)
LNA_POP	0.0252	-0.0372*	-0.0217	-0.00328	-0.00497	-0.0111	0.220*
	(1.64)	(-2.32)	(-0.81)	(-0.16)	(-0.24)	(-0.51)	(2.21)
HUMAN_CAP	1.615***	2.747***	2.336***	0.19	0.688	-0.117	20.99***
	(4.71)	(5.22)	(4.32)	(0.34)	(0.86)	(-0.29)	(4.63)
MIG_COST	0.0495	0.129*	0.112	0.153	0.238**	0.149	0.145
	(0.76)	(1.97)	(1.33)	(1.59)	(2.61)	(1.40)	(0.47)
JAN_TEMP	0.00870***	-0.00456	-0.00383	0.00483	0.00244	0.00417	-0.0109
	(3.88)	(-1.54)	(-1.26)	(1.51)	(0.52)	(1.27)	(-0.58)
COASTAL	-0.0108	0.0116	0.00126	-0.0473	-0.012	-0.0471	-0.144
	(-0.291)	(0.45)	(0.04)	(-1.59)	(-0.30)	(-1.61)	(-0.52)
CULTURE	0.139***						
	(3.71)						
Constant	-0.226	11.03***	10.87***	7.904***	8.014***	8.001***	-1.46
	(-0.975)	(47.00)	(26.98)	(26.09)	(27.21)	(25.48)	(-1.06)
Observations	163	163	162	163	163	163	163
Adjusted R-squared	0.313	0.618	0.458	0.117	0.119	0.033	0.743
F-stat	23.69						

Clustered t statistics in parentheses. + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

Table 3.13: IV regression on inclusiveness index for low-skilled

Variable	(1) Frist Stage	(2)	(3)	(4)	(5)	(6)	(7) LN(MIG_SIZE_LOW)
		LN (Average wage)					
		Metropolitan Area	Urban District	Migrant	High-skilled migrants	Low-skilled migrants	
AVG_INC_LOW		0.501	0.404	-0.0332	0.58	0.0193	9.116**
		(1.18)	(0.86)	(-0.07)	(0.90)	(0.04)	(2.75)
LNA_POP	-0.00576	-0.0258+	-0.0137	0.0186	-0.0126	0.0154	0.109
	(-1.126)	(-1.92)	(-0.68)	(1.25)	(-0.67)	(1.02)	(0.92)
HUMAN_CAP	0.443***	3.591***	3.303***	0.952+	1.756**	0.622	21.02***
	(3.82)	(10.00)	(8.01)	(1.91)	(2.79)	(1.51)	(6.84)
MIG_COST	0.0346**	0.129*	0.145*	0.11	0.222*	0.101	0.273
	(2.43)	(2.11)	(2.31)	(1.44)	(2.09)	(1.27)	(0.52)
JAN_TEMP	0.00279***	-0.000301	0.000336	0.00905***	0.00435	0.00907***	-0.0173
	(5.78)	(-0.12)	(0.15)	(3.44)	(1.13)	(3.50)	(-1.24)
COASTAL	0.00442	0.00958	-0.00869	-0.0447+	0.00226	-0.0497*	-0.0378
	(0.27)	(0.37)	(-0.29)	(-1.80)	(0.07)	(-2.01)	(-0.14)
CULTURE	0.0647***						
	(3.52)						
Constant	0.116	10.90***	10.80***	7.605***	8.132***	7.641***	2.734
	(1.52)	(53.67)	(35.73)	(32.84)	(27.43)	(32.90)	(1.54)
Observations	263	263	262	263	263	263	263
Adjusted R-squared	0.335	0.54	0.447	0.167	0.115	0.161	0.463
F-stat	16.69						

Clustered t statistics in parentheses. + p<0.10 * p<0.05 ** p<0.01 *** p<0.001

Table 3.14: IV regression using dependency ratio

Variable	(1) Frist Stage	(2)	(3)	(4)	(5)	(6)	(7)
		LN (Average wage)					LN(MIG_SIZE_LOW)
		Metropolitan Area	Urban District	Migrant	High-skilled migrants	Low-skilled migrants	
INC_LOW		0.296	-0.173	0.114	-0.318	0.177	15.58**
		(0.55)	(0.31)	(0.20)	(0.32)	(0.36)	(2.97)
LNA_POP	0.00284	-0.0261*	-0.0153	0.0188	-0.0142	0.0157	0.121
	(0.608)	(1.96)	(0.77)	(1.27)	(0.79)	(1.03)	(0.85)
HUMAN_CAP	0.537***	3.718***	3.666***	0.861+	2.313**	0.524	17.00***
	(5.089)	(8.61)	(7.96)	(1.65)	(2.95)	(1.11)	(6.03)
MIG_COST	0.0255*	0.137+	0.168*	0.105	0.257*	0.0953	0.0220
	(1.765)	(1.93)	(2.30)	(1.19)	(2.18)	(1.10)	(0.04)
JAN_TEMP	0.00285***	0.000266	0.00192	0.00864*	0.00684	0.00863*	-0.0352*
	(6.315)	(0.10)	(0.78)	(2.39)	(1.51)	(2.46)	(2.39)
COSTAL	0.0107	0.0131	0.000790	-0.0473+	0.0177	-0.0524*	-0.149
	(0.731)	(0.39)	(0.02)	(1.86)	(0.41)	(2.07)	(0.44)
DEP	0.00434***						
	(3.072)						
Constant	-0.0475	8.429***	8.351***	7.597***	8.179***	7.633***	2.389
	(0.662)	(41.65)	(27.83)	(33.22)	(29.24)	(32.63)	(1.17)
Observations	263	263	262	263	263	263	263
Adjusted R-squared	0.329	0.531	0.402	0.168	0.093	0.159	0.246

t statistics in parentheses; =+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

3.6.2 Profiles of Chinese internal migrants in 2014

Migrants' contribution to the economy in fact highly depends on their characteristics. Existing studies that have confirmed the positive relation between migration and the economy, especially relation with productivity and innovation, are mostly based on the examinations of high-skilled migrants who are dis-porportionally in the STEM industry. In this section, I provide a basic profiling of Chinese internal migrants using 2014 survey data in an effort to seek the underlying mechanisms of migrants' contribution to urban economy in China. I focus on four aspects, e.g., education, age, occupation and entrepreneurship. These four types of characteristics are essentially the foundation of macro-level claims on migrants' contribution to the economy.

1) *Education status*

Table 3.15 shows that most urban migrants in China have middle school education, and only 4.5% migrants have college and above degrees. This is very different from the education spectrum of immigrants in the U.S. where most migrants concentrate at the top and the bottom of the schooling distribution (Peri, 2013). [14]

Table 3.15: Migrants' education

Education	None	Primary School	Middle school	High school	Professional& vocational school	College& university	Postgraduate
Percentage(%)	1.66	12.91	52.72	19.9	8.241	4.22	0.343

2) *Employment status*

This subsection explores migrants' employment status. In the U.S., low-skilled migrants often work in manual jobs, whereas similarly-educated natives occupy positions that require more intensive linguistic and communication skills, such as coordinators (Peri, 2013). Similarly, high-skilled migrants also concentrate in STEM industries where their skills are

[14]The education mixture of immigrants in the U.S. thus raises the supplies of the least and the most skilled labor, and the share of college-educated migrants are similar to that of natives, which thus did not significantly alter the relative supply of high- and low- skilled labor (Peri, 2013).

more transferable (OECD, 2014; J. Hunt et al., 2010). Table3.16 shows that most urban migrants in China work in small business, manufacturing, and local service industries, which corresponds to their education profiles.

Table 3.16: Migrants' vocations

Vocation	Sub-vocation	Percentage(%)
Managers		0.485
Professionals/technicians/scientists		7.131
Civil service/staff		1.346
Business		23.75
	Business A	18.47
	Business B	5.283
Local services		34.02
	Dining	10.61
	House service	0.526
	Cleaning	1.255
	Security	1.156
	House renovation	4.239
	Other service	16.23
Agriculture, fishery, forestry, etc.		3.614
Manufacturing		26.56
	Manufacturing	14.49
	Transportation	2.677
	Construction	5.148
	Others	4.248
Others		3.09
Total		100

3) *Entrepreneurship among urban migrants*

Extant literature argues that one important channel that migrants contribute to urban economy is their high entrepreneurship. To briefly explore entrepreneurships among Chinese urban migrants, Table 3.17 shows the distribution of employers and self-employed migrants among different vocations. It is evident that most Chinese urban migrants are small business owners, or own business in local service industries, which corresponds to the relatively low education among urban migrants. There are few high-tech start-ups among Chinese urban migrants.

Table 3.17: Entrepreneurship among urban migrants

Vocation	Sub-vocation	Employers(%)	Self-employment (%)
Managers		0.404	0.016
Professionals/technicians/scientists		2.103	1.417
Civil service/staff		0.114	0.040
Business		58.216	53.080
	Business A	51.130	39.410
	Business B	7.086	13.670
Local services		26.372	28.915
	Dining	12.020	12.050
	House service	0.267	0.456
	Cleaning	0.130	0.278
	Security	0.069	0.043
	House renovation	3.566	5.798
	Other service	10.320	10.290
Agriculture, fishery, forestry, etc.		5.425	6.041
Manufacturing		6.856	7.224
	Manufacturing	2.171	1.116
	Transportation	1.470	3.007
	Construction	2.202	2.268
Others		1.013	0.833
Total		100	100

4) *Age structure of urban migrants*

Figure 3.3 shows the age distribution of Chinese urban migrants in 2014. Similar with what's found in the U.S., Chinese urban migrants also concentrate at an economically active age, roughly 25-45 years old.

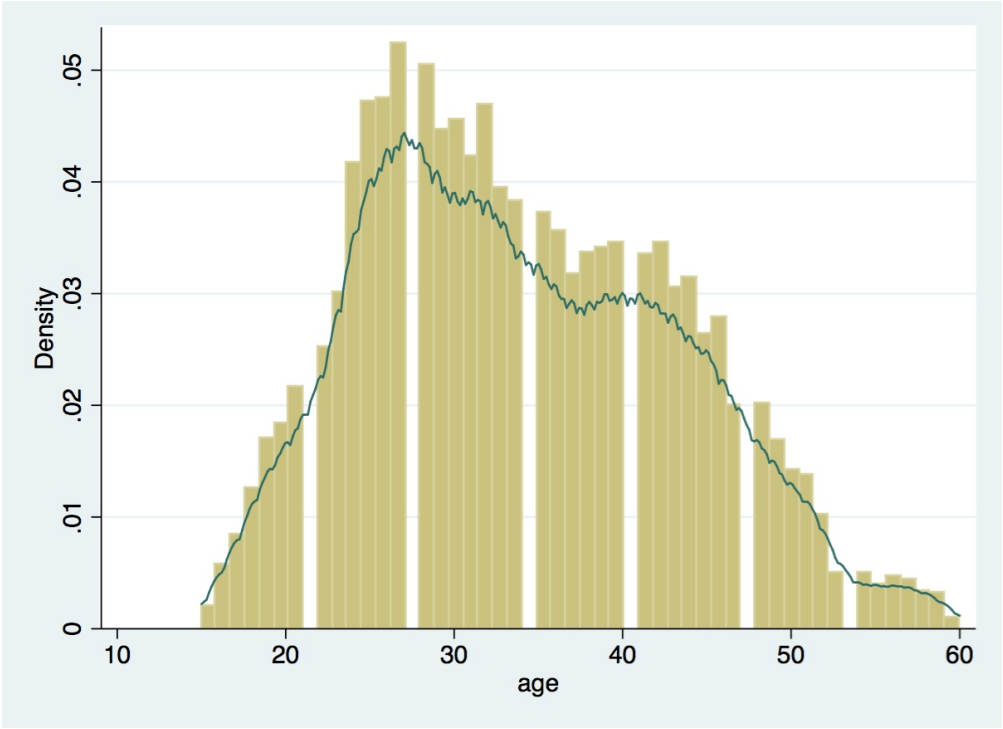

Figure 3.3: Migrants' age distribution

CHAPTER 4

The role of urban inclusiveness in internal migrants' inter-city location choice

This paper analyzes how urban inclusiveness distorts migrants inter-city location choice from a micro perspective. Urban inclusiveness is defined as the extent to which local government allows urban migrants to access local social services. I measure it with a composite index that captures the coverages of five social insurances and housing provident funds among urban migrants in destination cities. A city's inclusiveness towards migrants depends on local economic condition, as well as local culture. Thus, it is both a type of urban informal institution, i.e., an attitude towards migration in local culture, as well as a measure of access to local social services to migrants that depends on local economic fundamentals. A long tradition of research in the US and Europe focuses on how inter-state/region welfare differentials affect the spatial relocation of migrants. However, these studies often can only discern the responsiveness of welfare recipients to welfare generosities. The case of China offers the opportunity to assess how discriminative provisions of social services based on local residency affects labor's decisions of destinations in general, instead of solely focusing on potential welfare recipients. I find migrants are more likely to move to inclusive cities, even after controlling for expected wage, housing costs and urban characteristics that affect quality of life. My findings suggest the importance of access to local social services in migrants location choice.

4.1 Introduction

Recent debates on immigration policy in the U.S. and Europe have triggered a new wave of rethinking the social, economic, and political impacts of immigration on host countries or regions. Among others, there are many concerns over whether the influx of migrants, especially low-skilled migrants, would exert excessive fiscal burdens to the welfare or redistributive programs in destination countries or regions (Razin & Sadka, 2004; Dustmann & Frattini, 2011; Schmidt-Catran & Spies, 2016). This correspondingly triggers substantial scholarly and policy interests on whether migration responds to cross-region/country differences in welfare systems. There has been a long tradition of research on welfare migration and welfare magnet theory that whether potential welfare recipients are more likely to migrate to regions with more generous welfare programs (Borjas, 1999), as well as the associated "welfare competition" and "race to the bottom" hypotheses that states/countries compete to lower their welfare benefits or set stricter eligibility requirements to avoid attracting potential welfare recipients, and to export their welfare burdens elsewhere (Brueckner, 2000). [1] Empirically, the welfare migration hypothesis and its associated hypotheses have been tested in both cross-country and within-border contexts, mainly in the U.S. and Europe. However, the empirical evidence is quite mixed, including strong, modest or no evidence of welfare migration (Dye & McGuire, 1997; Gelbach, 2004; Peterson & Rom, 2010; Snarr, Friesner, Burkey, et al., 2011; Frey, Liaw, Xie, & Carlson, 1996; Enchautegui, 1997; Meyer, 1998; Zavodny, 1999; Levine & Zimmerman, 1999; Kaestner, Kaushal, & Van Ryzin, 2003; McKinnish, 2005; Kaushal, 2005; McKinnish, 2007; De Giorgi & Pellizzari, 2009; Kennan & Walker, 2010; Walker et al., 1994; Pena, 2014).

Despite such intensive debates over welfare migration among demographers, labor economists and political scientists, it is interesting that urban and regional scientists rarely put great emphasis on the role of cross-city differences in welfare or general local public services provisions, in explaining labor's inter-city migration patterns. On the contrary, local public

[1] For example, the fear of welfare migration used to induce many U.S. states to set residency requirements in their respective welfare programs, which were though all struck down by the Supreme Court in the 1960s (McKinnish, 2005).

service provisions are often used to explain intra-city residential location choice based on the Tiebout Hypothesis, despite that Tiebout theory also implies the potential welfare-induced migration over long distance across cities or regions (Tiebout, 1956; E. L. Glaeser, 2008). When explaining labor's cross-city relocations, urban and regional economic theories regard job opportunities, amenities, and housing price as the core drivers. These factors are built in the classic urban models to explain the equilibrium distribution of population across cities and are widely used by urban and regional scholars (E. L. Glaeser, 2008). Consequentially, most extant scholarly debates in urban and regional science have revolved around the relative importance of jobs and amenities in determining inter-city migration and urban population dynamics, i.e., job-led migration vs. amenity-led migration. [2]

However, it is in fact of particular importance and usefulness for urban scholars to understand how welfare and the general local public service provisions influence inter-city migration patterns. Studies of the inter-city/region migration in urban and regional science are often motivated by the ultimate goal of understanding the uneven economic development patterns across regions and cities, and how to boost local development through attracting and retaining desired labor. From the perspective of policy-making, local governments have more direct influences on local public service provisions than they have on jobs, amenities or local housing price. Thus, understanding the role of public services in inter-city migration could inform local policy-makers of their roles in influencing local migration flow, the resultant labor and human capital concentrations, as well as the ultimate urban development.

For demographers, it is also important to move beyond welfare migration and to understand how differences in provisions of general local public services across cities affect internal migration patterns, because most internal migrants are not potential welfare recipients and welfare migrants only constitute a small segment of the migrant population. Furthermore,

[2]Amenities include natural amenities such as climate and air quality (Mueser & Graves, 1995; G. L. Hunt & Mueller, 2004; Rappaport, 2007; Cheshire & Magrini, 2006; Bayer et al., 2009), as well as man-made consumption amenities (D. E. Clark & Hunter, 1992; D. J. Lewis, Hunt, & Plantinga, 2002; Gottlieb & Joseph, 2006; E. L. Glaeser et al., 2001). Expected job opportunities and wage are also important drivers of long-distance migration in urban and regional economic theories (Greenwood, Hunt, Rickman, & Treyz, 1991; Mueser & Graves, 1995; Davies, Greenwood, & Li, 2001; G. L. Hunt & Mueller, 2004; Kennan & Walker, 2011; Dahl & Sorenson, 2010).

in most countries, the size of internal migration is usually much larger than that of international immigration, and so are their influences on receiving regions (Mundial, 2009). Internal migrants also tend to have different migration behaviors compared with their international counterpart (Mundial, 2009). Even for international immigration, it is often the specific cities and regions that ultimately absorb the impacts of migration. Thus, it is important to understand how internal migrants are incentivized to move and to settle by cross-city differences in public service provisions.

To fill these gaps, this research examines the role of local public service provisions in internal migrants' decisions of destination cities. The institutional background is the Household Registration (Hukou) System in China. This system assigns residency to each Chinese citizen. Local governments in China often use Hukou system as a tool to control and to manage local migration flow by determining the eligibilities to access certain local public services based on ones' local residency status, especially the access to social insurance benefits. Many urban migrants in China are thus often denied of access to social insurance programs once migrating to cities other than their registered cities. Due to the decentralized governance and financing system, cities vary greatly in their coverage of social insurances among migrants. Using this cross-city variations in the provisions of social insurances towards urban migrants, this research constructs a composite urban inclusiveness index with factor analysis to measure the extent to which local governments allow migrants to access local social insurance programs and examines how different provisions of social services across cities affect migrants' decisions of destination cities.

The contributions of this research are two folds. First, it contributes to urban migration literature and extends our understandings on the relative importance of local public service provision in migrants' inter-city location choice. Second, extending extant welfare migration research, this paper examines whether migrants in general are incentivized to move in response to differentials in local social services across regions/cities. Previous research on welfare migration can only detect the effects of certain welfare programs on migrants who are potential welfare recipients, which only constitute a specific segment of migrants (usually low-income migrants) (Giulietti & Wahba, 2013). The generalizability of these studies

from potential welfare recipients to migrants population in general is often compromised as a result (Meyer, 1998; McKinnish, 2005). In our study, despite being a type of welfare, the social insurance programs in China is a basic social safety net that is supposed to cover all social groups regardless of their socioeconomic status. The only restriction imposed by local governments is the local residency requirement that only differentiates between urban migrants and urban natives. This institutional arrangement allows us to detect the effects of general social service provisions, in stead of welfare programs, on the cross-city migration decisions of all migrant groups, in stead of potential welfare recipients. [3]

4.2 Related literature in welfare migration

In the US and Europe, there have been a sizable literature on welfare migration, which is similar with but slightly different from the role of public service provision in migration. Welfare migration and welfare magnet theory contend that potential welfare recipients would migrate to regions with more generous welfare programs in order to receive higher welfare (Borjas, 1999). Specifically, generous welfare system could attract migrants who would otherwise have not migrated, and retain migrants who would have otherwise returned to home countries/regions (Giulietti & Wahba, 2013). This correspondingly leads to "welfare competition" and "race to the bottom", that states/countries compete to lower welfare benefits or set stricter eligibility requirements to avoid attracting potential welfare recipients, and to export their welfare burdens elsewhere (Brueckner, 2000). The fear of welfare migration used to induce many US states to set residency requirements in their respective welfare programs, which were though later all struck down by the Supreme Court in the 1960s (McKinnish, 2005).

The welfare migration hypothesis and its associated theories have been tested in either cross-country or within-border contexts, mainly in US and Europe.[4] The main operational

[3]Welfare is a similar but different concept with local public service. The latter has a broader coverage of potential beneficiaries, whereas welfare programs are usually targeted towards low-income population.

[4]Much US literature has been focused on the cross-state differences in social welfare program generosity on migration decisions, specifically in programs for which states have the authority to set the coverages and

question under investigation is whether potential welfare recipients are more likely to migrate to regions with high welfare benefits. However, the empirical evidence is quite mixed. Some research find quite significant welfare migration in response to cross-region welfare differentials (Gramlich & Laren, 1984; Blank, 1988; Dye & McGuire, 1997; Gelbach, 2004; Peterson & Rom, 2010; Snarr et al., 2011), albeit some effects are only evident for specific migrants group such as refugees (Zavodny, 1999). Some only find weak effects of welfare generosities on migration compared with labor market conditions, such as wage and employment opportunities, i.e., modest welfare-induced migration compared with job-led migration (Cushing, 1993; Frey et al., 1996; Enchautegui, 1997; Meyer, 1998; Zavodny, 1999; Levine & Zimmerman, 1999; Kaestner et al., 2003; McKinnish, 2005; Kaushal, 2005; McKinnish, 2007; De Giorgi & Pellizzari, 2009; Kennan & Walker, 2010), whereas some research find no evidence of welfare migration (Walker et al., 1994; Allard & Danziger, 2000; Pena, 2014). Methodologically, previous welfare migration research has been facing two major challenges, which partially lead to the mixed empirical evidence of welfare migration (Giulietti & Wahba, 2013). First, welfare policy itself is often endogenous and is determined by migration flow (Giulietti, Guzi, Kahanec, & Zimmermann, 2013). On one hand, measures of welfare generosity such as welfare-spending are often mechanically inflated by the pure number increases brought by in-migration of potential welfare recipients; on the other hand, welfare policy may also react to migration flows in terms of eligibility criteria or welfare duration (Giulietti et al., 2013). In fact, much research has documented such reverse causality that migration (immigrants or internal-migrants) affects the welfare/re-distributive programs in destination countries or regions, such as the eligibility criteria or welfare duration, despite of the mixed evidence (Razin & Sadka, 2004; Böheim & Mayr, 2005; Dustmann & Frattini, 2011; Poppleton, Hitchcock, Lymperopoulou, Simmons, & Gillespie, 2013; Schmidt-Catran & Spies, 2016; Soroka, Johnston, Kevins, Banting, & Kymlicka, 2016) . Such endogeneity is especially problematic in early studies that directly regress aggregate cross-county/state/country

levels of benefits. These programs usually exhibit great cross-state variations in its benefits. Frequently studied programs include the Aid to Families with Dependent Children (AFDC) that provides cash aids to low-income single mothers, as well as its later reformed version, the Temporary Aid to Needy Families (TANF).

migration flows of potential welfare recipients on measures of welfare generosities (Gramlich & Laren, 1984; Walker et al., 1994; Giulietti et al., 2013), leading to biased estimates of the welfare migration effect (Giulietti et al., 2013).

Later studies have attempted to address the edogeneity of welfare policy through IV approach(Giulietti et al., 2013), and quasi-experiment approach (Giulietti et al., 2013; Fiva, 2009; Razin & Wahba, 2015; McKinnish, 2005, 2007; Edmark, 2009). [5] Discrete choice model with micro-data is an alternative way to circumvent the policy endogeneity issue since policy will not be affected by individual migrant (Plantinga, Détang-Dessendre, Hunt, & Piguet, 2013).

In addition to the policy endogeneity, unobserved urban attributes that simultaneously correlate with welfare policy and migration decisions raise another methodological challenge to the causal identification of the effect of welfare differentials on potential welfare recipients. To solve this issue, counter-factuals using migrants who share similar attributes with welfare migrants but are not affected by welfare policy are widely used as control groups to achieve identification (Walker et al., 1994; Levine & Zimmerman, 1999; Meyer, 1998; Gelbach, 2004; McKinnish, 2005, 2007). The idea is to eliminate unobserved determinants of migration, especially those correlate with welfare policy and lead to biased estimates of the welfare effect, such as economic gains or labor market incentives. However, there are also concerns that solely controlling for observed attributes cannot sufficiently guarantee the similarity and comparability in unobserved characteristics between the control group and treatment group,which may still result in biased estimates (Fiva, 2009; Kaestner et al., 2003). In terms of results, mixed evidence is still found in studies that seek to address policy endogeneity and omitted variable biases, such as modest causal effects of welfare benefits on migration (Walker et al., 1994; Levine & Zimmerman, 1999; Meyer, 1998; Gelbach, 2004; Giulietti et al., 2013), or a strong evidence of welfare migration (Fiva, 2009; Razin & Wahba, 2015; McKinnish, 2005, 2007), or no evidence at all (Edmark, 2009). Nevertheless, this issue is of less concern in this research since the population of interest is the whole migrant population,

[5]Research using quasi-experiment approach usually adopts a difference-in-difference strategy and welfare reform.

instead of welfare recipients.

The availability of micro-data allows for the usage of discrete choice model in later studies. Blank (1988) use a choice model of locations (Blank, 1988). Frey et al (1996) model the sequential decisions of whether to move and where to move with a nested logit model (Frey et al., 1996). Kennan and Walker (2010) analyze migrants' responses to differences in income and welfare with sequential migration decisions that maximize life-time expected income (Kennan & Walker, 2010). De Jong et al (2005) separately model the departure and destination effects of welfare policy with a nested discrete choice model, and find stringent welfare policies encourage out-migration of poor families, but migrants are not drawn to states with generous welfare (De Jong, Graefe, & Pierre, 2005). As discussed above, discrete models with micro-data could well address the policy endogeneity and omitted variable biases.

Given the advantages of discrete choice model in addressing policy endogeneity and omitted variable bias, this research adopts discrete choice model and uses predicted values of social insurance coverages, i.e., urban inclusiveness towards individual migrant to estimate the effect of urban inclusiveness in migrants' location choice. I fully predict the expected values of each major determinant in urban migration theories for each individual's potential destination cities, including expected wage, cost-of-living and social insurance benefits, while controlling for other natural and man-made urban amenities that affect migration decisions. Using micro-data and predicted values, I circumvent endogeneity issues because each individual can be viewed as a policy-taker (Giulietti et al., 2013; Plantinga et al., 2013). By explicitly predicting and controlling for migrants' potential gains in alternative destinations with micro-data, I could differentiate the effect of urban inclusiveness from that of other migration drivers, which is argued to be a better approach to address omitted variable bias (Blank, 1988; Enchautegui, 1997; Fiva, 2009; McKinnish, 2005). Furthermore, explicitly controlling for predicted migration drivers can also resolve the concern that the potential correlations between urban inclusiveness with unobserved or omitted urban characteristics may lead to biased estimates of the effect of urban inclusiveness on location choice (Giulietti & Wahba, 2013). Despite that it is impossible to fully control for all push and pull factors

that influence migration, as long as variables that correlate with urban inclusiveness are controlled, I could obtain unbiased estimates. Among others, it is particularly important to separate the effects between welfare benefits and economic gains since these two variables are often highly correlated with each other. One way to resolve this is to predict the labor-market opportunities and earnings in potential alternative designation with micro-data and explicitly control for them (Blank, 1988; Enchautegui, 1997). In this paper, two key determinants of urban inclusiveness, local labor demand and local fiscal capacity (Hu & Wang, 2017b), can be explicitly controlled in the empirical specification by including local wage level as indicator of urban economic performance. By controlling for these counfounders, I resolve the concern of omitted variables.

4.3 Method and data

Following McFadden's random utility theory, migrants' utility of selecting a city to move is composed of a systematic utility and a random term, and one's utility is maximized in current location selected. Based on the existing theory of inter-city migration, I assume the systematic utility of a potential destination for an individual depends on expected income, expected housing burdens, urban amenities and migration costs. Assuming each migrant has M potential destinations to choose from, using i to indicate cities, $i = 1, 2, 3...M$, k to indicate individuals, $k = 1, 2, 3...N$. I have the following utility function.

$$\begin{aligned} U_{ki} &= V_{ki} + \epsilon_{ki} \\ &= U(INC_{ki}, HC_{ki}, A_i, MC_{ki}) + \epsilon_{ki} \\ &= \beta_0 + \beta_1 INC_{ki} + \beta_2 HC_{ki} + \beta_3 A_i + \beta_4 MC_{ki} + u + \epsilon_{ki} \end{aligned} \tag{4.1}$$

Let U_{ki} be the utility individual k obtains by selecting alternative city i. Migrant k selects city i if $U_{ki} > U_{km}, \forall i \neq m$. V_{ki} is the systematic utility, and ϵ_{ki} is a random component, as shown in Eq (4.1). V_{ki} is a function of expected income INC_{ki}, expected housing costs HC_{ki}, urban amenities in city i, A_i, and migration cost MC_{ki}. INC_{ki} , HC_{ki}, and MC_{ki} are individual-location-specific variables that depend on the individual and the

potential alternative city. ϵ_{ki} is assumed to be i.i.d.Gumbel distribution across individuals and alternative cities.

Thus, the probability of individual k selecting city i is

$$\begin{aligned} P(y_{ki}=1) &= Prob(U_{ki} > U_{km}, \forall i \neq m) \\ &= \frac{exp(\beta_0 + \beta_1 INC_{ki} + \beta_2 HC_{ki} + \beta_3 A_i + \beta_4 MC_{ki})}{\sum_{i=1}^{M} exp(\beta_0 + \beta_1 INC_{ki} + \beta_2 HC_{ki} + \beta_3 A_i + \beta_4 MC_{ki})} \end{aligned} \tag{4.2}$$

β_i are the coefficient vectors of each migration driver to be estimated.

The Likelihood function of observing current distribution of migrants across cities is:

$$L = \prod_{1}^{M} \prod_{1}^{N} P(y_{ki}=1)^{D_{ki}} \tag{4.3}$$

$D_{ki} = 1$ if city k is selected by individual i. By maximizing the Likelihood function, I obtain estimates of the effects of urban inclusiveness in migrants' decisions of destination cities.

The data is the 2014 Migrant Population Survey in China. This dataset uses a stratified, multi-stage probability proportional to size (PPS) sampling scheme to sample around 160,000 urban migrants in over 300 Chinese cities in 31 provinces annually. It has the information on whether a migrant has five types of social insurances and housing provident funds in destination cities, including pension, medical insurance, unemployment insurance, work-injury insurance, maternity insurance, and housing provident funds. Using these dummy variables and factor analysis, I construct a composite urban inclusiveness index for each individual migrant to measure the city's provision of social services to urban migrants. Other urban attributes data are computed from China City Statistical Yearbook.

Table 4.1 is the summary statistics of individual characteristics. 62% migrants in our sample are males; similar with migrants elsewhere, Chinese urban migrants on average are at their prime-age, i.e., 35 years old; most migrants are married and have a local household size of 2-3. Only 18% migrants have non-agricultural Hukou. 61% migrants move from other

provinces. The education profile shows that most Chinese urban migrants have middle or high school degree, and only 6.6% migrants have college or above college degree. Corresponding to the education level, 83% migrants work in low-end services, small business, or manual jobs in private sector. Self-employment is also an important form of employment for urban migrants, constituting 33% migrants. Table 4.2 lists the relevant urban characteristics that may affect migrants' location choice. To better identify the role of urban inclusiveness, I calculate several amenity indexes to better control for the influences of urban amenities, including urban economic condition, natural and man-made amenities.

In the next section, I explain in details the prediction of key migration drivers, i.e., expected wage, expected housing costs, and expected inclusiveness.

4.4 Prediction of migration drivers

This section introduces the estimation of major drivers of cross-city migration. To address the caveats of aggregate measures, I use a Mincerian-style equation to predict the expected wage and housing cost in each alternative potential destinations, following Plantinga et al (2013) (Plantinga et al., 2013). The prediction of expected housing cost consists of two steps. First, I predict the expected probability that a migrant selects a certain housing type if s/he moved to city i. There are six housing types to choose from, including rent/own public housing, rent/own private housing, self-built housing and rent from employers. In this way, I also account for migrants' potential housing tenure choice in city i. Second, I compute the weighted average monthly rent that each migrant might face in each alternative city, using the median monthly cost of each housing type in city i and each migrant's predicted probability of housing choice as weights. [6] [7]

[6] Median rent is more robust to extreme values than mean rent.

[7] I also attempted to directly predict the expected rent of each housing type in each potential city. However, the housing type selected by migrants are very unevenly distributed across cities. The majority of migrants opt into private rental housing, whereas public housing (rental or owned), and self-built housing are very rare. Thus the observations of these housing types in some cities are not sufficient to predict housing cost of that particular housing type in the city. The insufficiency of observations is not an issue when predicting housing type, since multinomial logit will automatically produce missing value for that housing type, which is then

Table 4.1: Summary Statistics: individual characteristics

Variables	Definition	Mean	S.D
		Obs=66456	
sex	Gender, 1=male	0.620	0.485
age	Age, min=15, max=60	35.044	8.559
married	Married=1	0.837	0.370
agri_hukou	Agricultural Hukou=0	0.182	0.386
hhsize	Local household size; author calculation	2.751	1.132
dif_pro	1= migrate from different province	0.612	0.487
lang_dif	1= with linguistic difference [a]	0.492	0.500
edu_2	Primary school	0.117	0.322
edu_3	Middle school	0.499	0.500
edu_4	High school	0.204	0.403
edu_5	Professional school	0.100	0.301
edu_6	College	0.060	0.237
edu_7	Post graduate	0.006	0.077
voc_manage	Management	0.007	0.083
voc_tech	Technical Experts	0.091	0.288
voc_staff	Staff	0.018	0.133
voc_prbus	Small business	0.259	0.438
voc_serv	Service	0.340	0.474
voc_produc	Operation/production/transportation	0.236	0.425
voc_farm	Agriculture/forestry/husbandry/fishery	0.023	0.149
voc_others	Others vocation	0.004	0.064
indu_2	Second industry	0.282	0.450
indu_3	Tertiary industry	0.692	0.462
unit_land	Land owner	0.015	0.122
unit_private	Private sector	0.741	0.438
unit_public	Public sector	0.084	0.277
unit_foreign	Foreign firms and firms using funds from Foreign, Hong Kong and Macau	0.055	0.227
unit_other	Others sector	0.004	0.065
emly_type1	Employee	0.550	0.497
emly_type2	Employer	0.106	0.308
emly_type3	Self-employed	0.329	0.470

Source: National Migrant Survey data in 2014 and author calculation
a. Author calculation; dialect information is from *Language atlas of China*. 2012. Beijing: Commercial Press;

Table 4.2: Summary Statistics: city characteristics

Variable	Definition	mean	S.D
			Obs=118
lgrp_percap	Ln(GRP per capita) [a]	10.992	0.481
grp_rate	GRP growth rate [a]	0.085	0.023
per_grp3	Percentage GRP in tertiary industry [a]	0.413	0.103
minority_share	Share of minority in 2010 census [d]	0.055	0.099
pr_inmig10	Share of in-migration in 2010 census [d]	0.175	0.139
human_cap	Percentage of total urban population with bachelor or above degrees among working age (15-64) population in 2010 Population Census [d]	0.059	0.042
openness	Economic openness index measures share of industrial value and numbers of non-domestic funded enterprises [a]	0.244	1.147
culture	Cultural index measures number of theaters, cinemas, music halls, and books in the libraries [a]	0.400	1.190
medical	Medical service index measures number of hospital, doctors and beds in hospital [a]	0.248	1.088
greenness	Greenness index measures green area and parks in the city [a]	0.256	0.957
trans_hub	Transport hub index measures passengers and freight traffic in a city [a]	0.260	1.119
transport	Transport index measures paved roads, buses and taxi coverage [a]	0.271	1.037
port_shore	Coastal city [c]	0.136	0.344
major_river	Adjacent to major river [c]	0.466	0.501
minor_river	Adjacent to minor river [c]	0.424	0.496
avgjantemp	Average January Temperature [f]	1.641	8.799
ezone1	Pearl River delta [b]	0.059	0.237
ezone2	Yangze River delta [b]	0.161	0.369
ezone3	Bohai Rim [b]	0.136	0.344
ezone4	others [b]	0.644	0.481
region1	Eastern region [b]	0.373	0.486
region2	Middle region [b]	0.263	0.442
region3	Western region [b]	0.280	0.451
region4	Northeastern region [b]	0.085	0.280

Source:
a. China City Statistical Yearbook and author calculation;
b. National Migrant Survey data in 2014;
c. China's History in Maps, http://worldmap.harvard.edu/maps/china-history;
d. 2010 Population Census in China;
e. China Meteorological Data Service Center, http://data.cma.cn/en.

Eq.(4.4) is the multinomial logit model to predict housing type in each city. $htype_{ki}$ is the housing type that migrant k might choose in city i. Table 4.1 lists the definition of each variable. I model housing type selection as depending on migrants' individual characteristics such as age, household size and education; it also relates to unit type and employment type, since job types may be related to the choice set of each migrant faces. Since the number of predictors requires adequate observations in each city for estimation, it excludes some cities from our final estimation sample.

Eq. (4.5) computes the expected monthly rent of migrant k in potential destination city i. $Pr(htype_{kih})$ is the probability of migrant k selecting housing type h in city i. $med(rent_{ih})$ is the median monthly costs of housing type h in city i. The summation is over all housing type in city i.

$$Logit(\widehat{htype}_{ki}) = f(gender, age, age^2, hhsize, education, unittype, employmenttype) \quad (4.4)$$

$$rentwt_{ki} = \sum_{h} Pr(htype_{kih}) * med(rent_{ih}) \quad (4.5)$$

Table 4.3 shows the results of an illustrative multinomial model of housing type choice using the national sample. Higher education increases the probability of selecting both public and private housing, but decreases the probability of living in self-built housing or employer-provided housing. Working in public sector significantly increases the propensity of renting/owning public housing compared with working in private sector. Self-employed migrants are the most disadvantaged in opting into public housing.

I then use a Mincerian-style wage equation to predict wage in each potential location for each individual. Eq.(4.6) is the equation fitted for each city to predict expected monthly

interpreted as zero probability of selection. However, OLS prediction of rents using too few observations will produce estimates of coefficients with very large residuals, which are unreliable to use. Thus, in my analysis, I only predict the probability of choices of each housing type as weights in each city, and use the median rent of each predicted housing type to compute the weighted rent in each alternative city. The median rent also simultaneously captures the aggregate housing price level at city scale.

Table 4.3: Multinomial results for housing type selection at national level

Base outcome: Private housing, rental	Public housing: rental=1	Public housing: own=1	Private housing: own=1	Self-built housing	Employer-provided housing rental=1
sex1	-0.00989	-0.102	-0.125***	0.213***	0.102***
	(-0.10)	(-0.96)	(-6.17)	-4.59	-6.47
age	-0.0725+	-0.0175	0.122***	-0.0749***	-0.110***
	(-1.75)	(-0.34)	-10.91	(-4.29)	(-18.08)
age2	0.00107+	0.000629	-0.00113***	0.00130***	0.00150***
	-1.9	-0.95	(-7.66)	-5.78	-18.21
married	-0.338*	0.810***	0.458***	-0.382***	0.118***
	(-2.11)	-3.49	-11.38	(-4.48)	-5.06
hhsize	0.222***	0.424***	0.438***	0.589***	-0.516***
	-4.4	-9.15	-47.99	-32.6	(-48.82)
edu_2	0.0189	-0.152	0.436**	-0.258*	-0.192**
	-0.05	(-0.25)	-3.19	(-2.24)	(-2.80)
edu_3	-0.684+	0.712	0.985***	-0.601***	-0.368***
	(-1.83)	-1.22	-7.4	(-5.33)	(-5.54)
edu_4	-0.509	1.356*	1.767***	-0.839***	-0.509***
	(-1.32)	-2.29	-13.17	(-6.64)	(-7.49)
edu_5	-0.459	1.762**	2.639***	-1.037***	-0.625***
	(-1.11)	-2.93	-19.46	(-6.22)	(-8.78)
edu_6	0.598	1.915**	3.131***	-1.976***	-0.742***
	-1.51	-3.12	-22.8	(-6.36)	(-9.71)
edu_7	1.180*	2.482***	3.188***	-2.052*	-0.863***
	-2.35	-3.47	-19.18	(-2.02)	(-5.60)
unit_private	-0.576***	-0.293+	0.348***	-1.512***	0.956***
	(-3.49)	(-1.68)	-9.46	(-33.75)	-25.05
unit_public	0.387+	1.148***	1.008***	-0.394***	1.334***
	-1.8	-5.56	-20.57	(-4.39)	-29.42
unit_foreign	0.896***	-0.679*	0.750***	-1.772***	1.118***
	-4.42	(-2.01)	-13.96	(-9.73)	-23.73
emly_type2	0.00892	-0.257	0.502***	-0.375***	-1.109***
	-0.05	(-1.35)	-16.32	(-3.62)	(-28.35)
emly_type3	-0.745***	-0.729***	-0.038	0.00177	-1.080***
	(-4.61)	(-5.20)	(-1.53)	-0.04	(-46.97)
_cons	-3.680***	-8.091***	-8.113***	-2.604***	1.317***
	(-4.84)	(-7.74)	(-34.20)	(-8.21)	-10.59
N	129745				
No.pars	85	LL	-104615.7	AIC	209401.4
pseudo-R2	0.134	LL0	-120775.5	BIC	210232.2

income for each migrant in each alternative city that s/he might choose from. [8]

$$\widehat{wage_{ki}} = \beta_{0i} + B_i X_k + \sigma_i \tag{4.6}$$

$\widehat{wage_{ki}}$ is the expected wage for migrant k in city i; β_{0i} is the city-specific intercept in the fitted wage model that captures all city-level shocks to individual wage; X_k includes migrants' individual characteristics that affect its expected earnings, including employment type(e.g., employee, employer, self-employ, etc.), sector(e.g., public, private, foreign firms, etc.), job type (e.g., management, technician, staff, businessman, etc.), industry (e.g., first, second, third, etc.), gender, education, age, and age squared. B_i is the coefficient estimates in city i; and σ_i is the city-specific residual that follows standard normal distribution. Table 4.4 is an illustrative model of national-level wage regression. As expected, wage rises with education level; low-end service vocations yield lower wage compared with other vocations; interestingly, certain manual jobs pay higher wage than vocations such as staffs or small businessmen. Non-domestic firms pay the highest wage, with private sector ranking the next. All else equal, self-employed migrants have higher wage premium than migrants who are regular employees.

I now turn to the main variable of interest, i.e., urban inclusiveness. There's no established theory on what factors determine the individual coverage of social services. However, social service coverage of migrant is highly related to their labor market condition. Thus I use similar specification as in Eq.(4.6) to predict individual inclusiveness level. In Eq.(4.7), expected individual inclusiveness depends on migrants' gender, age, education, and labor market conditions. As analyzed in previous chapters, city-level factors certainly affect the individual-level inclusiveness, such as fiscal capacity, labor demand or culture. I include a constant term in the city-specific prediction model as a city fixed effect and to capture city-level influences.

[8]Monthly income includes wage and the discounted monetary cost of housing and meals covered by employers.

Table 4.4: Illustrative model of national-level wage regression

Dependent variable: Ln(monthly wage (yuan))	Coefficients	t-statistics
Gender, Male=1	0.228***	(81.69)
Age	0.0399***	(38.01)
Age Square	-0.000543***	(-36.35)
Education: base group= no education		
Primary School	0.0820***	(6.30)
Middle school	0.170***	(13.41)
High School	0.243***	(18.79)
Professional School	0.337***	(25.02)
College	0.496***	(34.18)
Post Graduate	0.756***	(27.30)
Vocation: base group=unemployed/no stable jobs		
Management	0.425***	(16.59)
Technical Experts	0.327***	(30.53)
Staff	0.226***	(16.33)
Small Business	0.227***	(21.80)
Service	0.194***	(20.17)
Operation/production/transportation	0.252***	(24.94)
Agriculture/forestry/husbandry/fishery	-0.00313	(-0.11)
Others	0.183***	(7.62)
Industry: base group=agriculture		
Secondary Industry	0.00539	(0.22)
Third Industry	-0.0784**	(-3.26)
Unit type: base group=no unit		
Land owner	-0.0285	(-1.50)
Private	0.0826***	(15.16)
Public sector	0.0457***	(6.38)
Foreign/Hong Kong/Macau/Taiwan-owned	0.103***	(14.16)
Others	0.0389	(1.64)
Employment identify: base group=others		
Employee	0.0162	(1.34)
Employer	0.421***	(30.34)
Self-employed	0.156***	(12.56)
Cons	6.538***	(157.18)
N	129643	
Adjusted R-squared	0.223	

t statistics in parentheses $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

$$\widehat{ssc_{ki}} = f(gender, age, age^2, education, employementtype, sector, jobtype, industry) \quad (4.7)$$

Table 4.5 is an illustrative regression of individual inclusiveness using national-level pooled data. As with wage, education positively associates with individual social service benefits. However, different from wage, there seems to exist significant differences in social service coverages between management, technician, staff and other vocations. Another important distinction exists in unit types. Migrant labor in public sector and non-domestic firms have significantly better coverage of social benefits. Furthermore, migrants who are employers and self-employed have significantly lower coverage of local social services.

Using Eq.(4.4)-Eq.(4.7) and migrant individual characteristics, I compute the predicted monthly wage, monthly housing cost, and level of social services in each alternative cities for each individual migrant. To ensure the power of prediction, I only keep cities whose sample size of migrants are above 150, which leaves 138 cities in the sample. However, the sample size of cities are further reduced due to missing values in other urban amenity variables. The number of cities in the final estimation sample are listed in the next section.

4.5 Empirical results

4.5.1 Social welfare among urban migrants in China

This sections presents some stylized facts about social welfare converge among urban migrants in Chinese cities. The upper panel in Table 4.6 lists the coverage of different social services among urban migrants. The average coverages of five social insurances are between 12% and 20%, whereas the average coverage of housing provident funds is relatively lower, only constituting 8% migrants. The lower panel in Table 4.6 shows the predicted income, inclusiveness and housing cost. The predicted monthly income has a mean of 3364 yuan, and a median of 3187 yuan, but it seems to have a very large variation across individuals and locations. The mean and median values of the predicted rent are very close, around 500

Table 4.5: Illustrative model of national-level inclusiveness regression

Dependent variable: inclusiveness	Coefficients	t-statistics
Gender, Male=1	-0.0101***	(-7.00)
Age	0.0153***	(29.81)
Age Square	-0.000191***	(-27.33)
Education: base group= no education		
Primary School	-0.00285	(-0.62)
Middle school	0.0277***	(6.13)
High School	0.103***	(21.49)
Professional School	0.249***	(44.00)
College	0.374***	(55.45)
Post Graduate	0.439***	(32.45)
Vocation: base group=unemployed/no stable jobs		
Management	0.243***	(17.71)
Technical Experts	0.168***	(35.45)
Staff	0.218***	(23.92)
Small Business	0.0165***	(5.10)
Service	0.0217***	(7.04)
Operation/production/transportation	0.0653***	(18.62)
Agriculture/forestry/husbandry/fishery	0.0469***	(4.77)
Others	0.0611***	(4.95)
Industry: base group=agriculture		
Secondary Industry	0.0320***	(3.64)
Third Industry	0.00768	(0.89)
Unit type: base group=no unit		
Land owner	0.00759	(1.30)
Private	0.0383***	(24.82)
Public sector	0.256***	(61.04)
Foreign/Hong Kong/Macau/Taiwan-owned	0.334***	(71.96)
Others	0.0512***	(4.73)
Employment identify: base group=others		
Employee	0.0446***	(8.07)
Employer	-0.0399***	(-6.91)
Self-employed	-0.0453***	(-8.40)
Cons	-0.364***	(-23.16)
N	129724	
Adjusted R-squared	0.448	

t statistics in parentheses $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

Table 4.6: Social service coverage among urban migrants and predicted values

Variable	Obs	mean	Median	S.D	min	max
Pension	145898	0.199	0	0.399	0	1
Medical insurance	145898	0.188	0	0.391	0	1
Work injury insurance	145898	0.196	0	0.397	0	1
Unemployment insurance	145898	0.156	0	0.362	0	1
Housing provident funds	145898	0.082	0	0.274	0	1
Maternity insurance	145898	0.115	0	0.319	0	1
Inclusiveness index	145898	0.165	0.153	0.113	0	0.545
Predicted values						
Predicted individual inclusiveness (p_faI_Y)	6744762	0.14	0.07	0.22	-0.98	2.48
Predicted monthly income (Yuan) (p_inc)	6744762	3363.52	3187.42	1869.61	27.70	531581.40
Predicted rent (Yuan) (rent)	4971597	517.89	500.00	245.36	0.00	5339.94

yuan. The predicted inclusiveness index is very close to the actual inclusiveness observed in the data. Given these predicted values, the next section proceeds to the location choice model.

4.5.2 Conditional Logit results

Table 4.7 presents results of the conditional logit model for the inter-city location choice. In all model specifications, I include an extensive set of urban amenity variables as well as proxies of migration costs. Since I use observed wage, housing cost, and social service coverage in 2014 to obtain expected values of these variables in each potential alternative city, the closer the location choice time to 2014, the more reliable results I get. Thus, I further subgroup the migrant sample based on the time of migration. Column (1) uses full sample. Column (2) to (4) include migrant samples who have resided in current city for less than three years, less than two years, and less than one year respectively. The last column using sample of migrants who have migrated to current city within the past year should yield the most reliable estimates. However, it also covers the smallest number of cities as a cost. The sample size of cities included in the last specification is 13, which may not constitute a representative sample of the whole city profile. Despite this, these cities are the primary magnet cities that attract the most migrants. Therefore, estimates using these samples are also very informative.

Results in Table 4.7 show that, social service coverage, i.e., inclusiveness, has consistently positive association with the probability of selecting current city across samples. [9] However, I also find the effect size of such association is declining when I impose restrictions on migrants' residence time in current city. Recent migrants tend to be less responsive to inclusiveness than early migrants. Such diminished effect of urban inclusiveness might due to a sample of cities that are too small to be representative of whole sample of cities when I increase the residence time restriction. It may also because new-comers tend to have different preferences in location choice. However, our model is unable to distinguish which effect is in action, or both. Despite this, overall I find a rather consistent positive relation between migrants' city choices and inclusiveness. I also tested the share of monthly housing cost among monthly income as the measure of individual housing burden, and the estimates of inclusiveness are almost the same with the ones using housing rent as the measure of housing cost. So I omit those results due to page limit.

Other migration drivers also yield interesting results. Expected income has consistently positive relation with location choice, but similar with inclusiveness, its effect sizes also vary slightly across samples that recent migrants value expected income more than early migrants who have resided in current city for years. Housing cost negatively affects the probability of selecting a city, but again, its effects vary across samples. Linguistic differences impede migration as expected, but distance encourages migration instead of discouraging it. GRP per capita, share of tertiary industry, human capital concentration, minority share all increase the probability of selecting cities. Contrary to our expectation, FDI concentration, cultural amenities, and urban green space do not improve migrants' propensity of location choice. Coastal cities significantly attract migrants than other cities with similar attributes.

[9]Since inclusiveness is a composite index constructed from six dummy variables by factor analysis, one unit increase in inclusiveness index does not bear much practical meaning. In other words, what meaningful is the index's relative magnitude instead of its absolute value. Thus I focus on the signs of coefficients in the analysis.

Table 4.7: Conditional logit model of location choice

choice	(1)	(2)	(3)	(4)
	Full sample	Residence time<=3	Residence time<=2	Residence time<=1
ln(p_inc)	0.223***	0.336***	0.367***	0.441***
	(8.25)	(8.05)	(7.77)	(7.51)
ln(rent)	-0.0818***	0.0182	0.0125	0.141***
	(-7.77)	(0.67)	(0.41)	(3.50)
p_faI_Y	0.839***	0.572***	0.430***	0.162+
	(18.45)	(8.47)	(5.62)	(1.69)
dif_pro	0.0425**	0.0313	0.0690**	0.111***
	(3.03)	(1.51)	(2.94)	(3.75)
lang_dif	-2.815***	-2.871***	-2.891***	-2.805***
	(-228.31)	(-154.91)	(-136.94)	(-106.28)
lgrp_percap	0.203***	0.185***	0.254***	0.219***
	(8.69)	(5.29)	(6.37)	(4.34)
grp_rate	-3.477***	0.577	0.393	0.186
	(-9.51)	(0.96)	(0.57)	(0.21)
per_grp3	0.473***	0.262+	0.504**	0.386+
	(4.69)	(1.76)	(2.98)	(1.82)
pr_inmig10	5.286***	5.035***	4.870***	5.874***
	(50.80)	(32.50)	(27.97)	(26.50)
human_cap	5.354***	6.179***	6.129***	5.852***
	(22.42)	(17.03)	(15.00)	(11.42)
minority_share	0.913***	1.427***	1.441***	1.216***
	(12.79)	(13.58)	(12.21)	(8.04)
openness	-0.139***	-0.201***	-0.225***	-0.286***
	(-16.65)	(-16.37)	(-16.42)	(-16.96)
culture	-0.0104	-0.0529***	-0.0545***	-0.0786***
	(-1.47)	(-4.80)	(-4.36)	(-4.94)
medical	0.177***	0.204***	0.220***	0.214***
	(24.53)	(19.04)	(18.28)	(13.89)
greenness	-0.257***	-0.212***	-0.207***	-0.241***
	(-30.34)	(-16.69)	(-14.59)	(-13.50)
transport_hub	0.0371***	0.0375***	0.0178	0.0173
	(5.23)	(3.68)	(1.55)	(1.17)
transport	0.00415	0.0579***	0.0533***	0.0275
	(0.54)	(5.00)	(4.07)	(1.63)
port_shore	0.213***	0.393***	0.465***	0.464***
	(10.82)	(13.69)	(14.59)	(12.08)
major_river	-0.189***	0.0281	0.0643+	0.223***
	(-8.54)	(0.85)	(1.74)	(4.74)
minor_river	-0.199***	-0.00452	-0.00988	0.0326
	(-10.65)	(-0.16)	(-0.31)	(0.81)
avgjantemp	-0.00457***	-0.00239	0.000166	0.00201
	(-4.17)	(-1.40)	(0.09)	(0.82)
Economic zone FE	Y	Y	Y	Y
Regional FE	Y	Y	Y	Y
N	3712556	1663851	1312917	848936
No.pars	30	30	30	30
pseudo-R2	0.244	0.249	0.251	0.244
LL	-144013.7	-64154.6	-50509.7	-32954.7
LL0	-190580.3	-85415.4	-67400.6	-43577.3
AIC	288081.4	128363.3	101073.3	65963.43

BIC	288435.8	128696	101399.7	66278.03
No. of city	55	20	15	13
No. of individual	26,937	12,023	9,482	6,131

t statistics in parentheses, $+p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001$

4.6 Conclusion

Using individual data and discrete choice model, I analyze the effect of local social service coverage, i.e., urban inclusiveness, in migrants' inter-city location choice. I predict key migration drivers, including wage, housing cost, and inclusiveness, in each alternative destination for each individual migrant. After controlling for urban amenities, expected wage, expected housing cost, and migration cost, I find the provision of social services to urban migrants positively increases migrants' probability of selecting destination cities, suggesting local social service provision, i.e., inclusiveness, is an important factor predicting migrants' location choice behaviors in addition to jobs, amenities, and housing cost. The results are in accordance with our findings in previous chapter that use aggregate city-level data. In Chapter 3, I find positive relations between urban inclusiveness and urban aggregate migrant size from a macro perspective. In this chapter, I find further support to this hypothesis by analyzing individual location choice behaviors with micro data.

Overall, my findings indicate that, not only potential welfare recipients, but migrants in general are responsive to generous social welfare system in their location choice. However, this does not suggest welfare migration will harm urban economy, since migrants also pay taxes to local fiscal budget, and contribute to urban economy through their skills, as indicated in our previous chapter.

CHAPTER 5

Conclusion

In this thesis, I study whether a city's inclusiveness and openness to migration could benefit urban development. Urban inclusiveness is measured as a city's provision of social services to migrants. It is a local distortion to migration that either increases or decreases the utility one obtains by migrating to destination cities. At micro-level, my empirical evidence shows that urban inclusiveness increases migrants' probability of migration, holding other migration drivers constant. At macro-level, I also find inclusive cities have higher concentration of migrants. By increasing the size of urban migrant stock, urban productivity is hypothesized to benefit from the increased labor supply and augmented agglomeration effects. Baseline OLS regression finds inclusiveness positively improves the productivity of marginal labor, assuming the marginal labor being a migrant. Partially alleviating policy endogeneity to some extent, and relaxing the assumption that the marginal labor being a migrant, Bartik IV regressions show urban inclusiveness contribute to overall urban productivity, instead of that of migrants, indicating potential economic gains by native labor from inclusiveness of more migrants. However, a more strict instrument variable regression using historical openness towards foreign culture indicates that, on average, only the inclusion of high-skilled migrants contributes to urban economy, whereas inclusiveness towards low-skilled migrants have no significant benefits. The non-significant effects of inclusion of low-skilled migrants is also confirmed by an alternative instrument variable using local dependency ratio. Overall, these results suggest a skill-based selective local migration policy to promote urban development. I also examine factors that determine the local inclusiveness towards migrants. I find local fiscal capacity, local labor demand, and culture explain the degree of urban inclusiveness towards migrants. My analysis suggests that, the decision-making of urban inclusiveness

towards migrants in China is still largely based on an instrumental view of migrants, instead of cultural or ideological reasons. And strategically and instrumentally speaking, an increasingly selective local migration policy based on skills and education benefits urban development.

However, several caveats of this research are worthwhile to mention while re-examining the original definition of inclusive development that emphasizes a broader range of beneficiaries of economic growth, and the conceptualization and analytical framework of this thesis. The core model of this thesis is constructed from an efficiency-based endogenous economic growth model, which is quantitatively and analytically tractable. However, the inherent assumptions and structure of the model will inevitably omit many valuable facets of the question at hand due to its limitation of analytical capability. For instance, as have been promoted by many scholars, the goal of development in this new era should be re-distributive so as to remedy for the rising inequality caused by structural and systematic failures, e.g., the market system increasingly rewards leaders, but gradually close the door of social mobility for the laggers. Even with a growth-oriented policy goal, policy-makers need to consider the negative social and political consequences of rising inequality that may hamper long-term economic prosperity. And of course, the current analytical frame is also incapable to incorporate the consideration that having equal opportunity to grow, to compete, and to strive is a basic human right. Thereby, for the purpose of continued economic prosperity of a city, selective inclusion of migrants based on their merits could benefit the urban economy; but on the on the hand, to achieve a more inclusive and equitable growth, it requires a fundamental re-definition of the goal and objective of development.

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