Overcoming the Agglomeration Paradox: Skill-Dependent FDI and Urbanization in China

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Abstract

The influx of foreign capital into cities in developing countries creates new labor demands, triggering significant internal migration as workers move for opportunities. But this mobilization creates a management problem for local governments. How do local officials manage competing interests in developing their labor market while preventing governance problems from excessive demand on public resources? Using the highly institutionalized case of China, I argue that local governments encourage long-term migration of "desirable" migrants by integrating them into social services while keeping others out. Variation in locally-invested FDI skill dependence drives variation in inclusivity towards internal migrants. Policies that facilitate the integration of internal migrants into local urban welfare systems correlate with investment in firms with greater dependence on high-skilled workers, especially when investment flows to firms established more than one year previously. These trends are strongest in eastern municipalities where market forces play a larger role in local development policies.

Keywords: Urbanization, economic globalization, migration, China, government services

Introduction

Foreign direct investment (FDI), local economic development, and urbanization often go hand in hand (Chen and Wu 2017; Li and Liu 2005). Cash-strapped local governments benefit

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from development driven by an influx of foreign capital (Chen 2018). Capital accumulates in cities to take advantage of agglomeration economies where dense networks of economic production reduce transaction costs and increase the flow of knowledge.[1] Foreign capital, in particular, benefits from and creates greater benefits of agglomeration because of higher skills premium and knock-on effects of technology and information transfers. As capital accumulates, so too do people, as internal migrants move to cities to take advantage of new economic opportunities and higher wages (Patra 2019; Fu and Gabriel 2012). While internal migrants fuel economic production by providing much needed labor and human capital, they are not always welcome. Urbanization creates greater demands on urban resources and government expenditures, increases inequality in the least developed contexts, and generates anti-migrant sentiment among local populations and politicians (Gaikwad and Nellis 2017; Glaeser 2011; Szabo *et al.* 2018). In extreme cases, urbanization can threaten urban and political instability (Côté and Mitchell 2017; Wallace 2014). This leads to the agglomeration paradox: capital accumulation creates positive feedback loops for economic development, but the subsequent agglomeration of people creates governance challenges. How do local leaders manage this trade off between the development benefits of foreign investment and the challenges of urbanization?

Managing urbanization and access to urban government services for internal migrants is an essential question in all developing contexts. Urbanization and economic development processes require adaptive policies to balance competing local priorities. And these policies of who gets government services have significant ramifications for socio-economic inequality and inter-generational mobility of internal migrant workers moving to cities for better opportunities. This is a particularly important question in the case of China. China has seemingly avoided the pitfalls of urban agglomeration relative to other large developing contexts, with fewer informal, overcrowded urban communities. Local governments in China routinely exclude internal migrants—the labor on which China's economic miracle depends—from government services by restricting household registration in urban areas in the name of social stability. Yet rigid exclusion of internal migrants from urban settlement is counterproductive to the gains of the agglomeration economy (Vortherms 2023). Local governments must find a way to balance the labor needs of economic development while also ensuring urban governance outcomes.

I argue that local governments manipulate access to government services to strategically encourage either permanent or temporary migration in response to foreign investment to overcome the agglomeration paradox. Traditionally, internal migrants in China lack access to government services because they lack local household registration, known as *hukou*. By not allowing internal migrants to obtain local *hukou*, municipal governments deny them permanent access to government services, reducing their fiscal burden.[2] This exclusion encourages short-term migration as migrants without services are more likely to return home in the long run. The fiscal burdens increased by incorporating internal migrants into urban services can be overcome, however, when FDI projects depend more on high-skilled labor. Skill-dependent foreign investment creates both the need for a more developed labor market and the benefits of skilled labor's positive externalities, such as technology transfers. When a municipality hosts skill-dependent FDI, local governments have greater incentives to expand access to government services, thereby encouraging permanent migration of skilled labor.

Data for this analysis come from official government sources and the Foreign-Invested Enterprises in China (FIEC) Database. I estimate the number of internal migrants in China who gain access to government services by estimating the net number of *hukou* transfers, where local governments grant registration to internal migrants, entitling them to government services, and by estimating the size of the population entitled to urban benefits. The FIEC Database, a census of every foreign-invested firm registered with China's Ministry of Commerce from 2014 until 2019, provides detailed information on the business operations of foreign multinational corporations and their subsidiaries in China. This detailed registration data allows for a nuanced approach to measuring skill dependence of firms not dependent on aggregate measures, such as country of origin or sector. Using a random forest supervised machine learning model, I classify foreign firms by skill dependence. I utilize these data sources in a series of panel fixed effects models and find that while overall foreign capital decreases the number of internal migrants with access to government services, capital in skill-dependent firms correlates to a larger urban benefits population.

This paper contributes to the broad literatures on globalization and urbanization, labor market management, and internal migration in developing contexts. In much of the existing literature, internal migration in response to development efforts is assumed, with governments supporting internal migration for development efforts. Yet less is known about the connection between variation in economic development and local government policy to encourage, or discourage, long-term settlement.[3] This paper directly addresses this question by examining the economic conditions under which internal migrants are incorporated into urban welfare systems, thus encouraging them to stay in the long term and expanding access to government services. Implications of this research also add to the broad literature on the distributional consequences of globalization. Existing research focuses on the role of institutions and labor organization in determining who benefits from economic globalization through welfare systems.[4] This analysis continues this story by analyzing under what conditions changing forms of urbanization leads to greater access to government services.

FDI, Urbanization, and Internal Migration

Urbanization is a natural response to the sector shift that occurs during development from agricultural to industrial production (Davis and Henderson 2003). As economies evolve from primary to secondary industry primacy, cities become sites of concentrated capital investment, both foreign and domestic, by developing investment-enhancing infrastructure that allow for increasing returns to scale and better transfer of information in agglomeration economies (Glaeser 2010). They also provide "dense local labour markets" which reduce costs for producers, especially those dependent on skilled labor with dynamic production needs (Scott and Storper 2003). Urban concentration of capital draws workers from the countryside to city centers in search of higher wages, which in turn supports economic development. This process is especially true for development driven by economic globalization, which depends more on dense networks of labor across the skill spectrum than domestic capital investment (Lin and Liaw 2000). Yet globalization's impact on internal migration is largely overlooked in the fields of political science and public policy.[5]

The study of population urbanization in the face of globalization is largely the domain of economics and geography, which provide a mixed picture of the relationship between the two with the general conclusion that "policies matter." Some scholars find that an export economy reduces local out-migration and increases local in-migration (Aguayo-Tellez *et al.* 2010), especially in non-central cities (Ades and Glaeser 1995), leading to higher levels of aggregate urbanization. Yet in lesser developed countries specifically, trade openness is not correlated with urban population nationally, but investment can lead to greater urbanization of the population (Gozgor and Kablamaci 2015). In China specifically, FDI is correlated with cities' economic growth, but not necessarily population growth (Zhao *et al.* 2003).

One explanation for these mixed results is the role of policy. Political and policy factors are important intervening variables in determining the process, size, and shape of urban growth (Ades and Glaeser 1995; Davis and Henderson 2003). Federal versus central systems shape how and where urbanization occurs (Henderson 1988). Authoritarian regimes traditionally encouraged the concentration of urbanization—and its subsequent resources—in central cities as a means of control (Ades and Glaeser 1995). And both national and local governments influence urbanization through policies (Scott and Storper 2003). Regardless of regime type, policies that provide greater infrastructure development, reduce trade barriers, and provide preferential industrial policies such as price and investment controls can all encourage urbanization or, in their absence, discourage it (Ades and Glaeser 1995; Hansen 1965; Henderson and Kuncoro 1996; Renaud 1981).

Managing Urbanization in China

China's cities provide an ideal case to identify local government management of urbanization in the face of globalization. Over the last forty years, China's economy transformed from near autarky to one of the largest global players. This change in economic dynamics is also matched with the change in its urban landscape. In 1980, China had 191 million people living in cities, or 19 percent of the total population (National Bureau of Statistics 2019). According to the 2020 census, the population residing in China's cities reached nearly 902 million, or 64 percent of the population (National Bureau of Statistics 2021). And yet unlike in other contexts, globalization and industrialization are locally not correlated with the size of the urban benefits population—the population that has access to urban welfare benefits provided by local governments—because of the household registration system, or *hukou* (He *et al.* 2016).

The *hukou* is a long-standing institution used to manage migration and urbanization in China. Every individual has a *hukou* which identifies them as a citizen of a particular city or county. Individuals are only permanently entitled to government services in the location where they are registered. Rights to a *hukou* follow *jus sanguine* principles, meaning children inherit their *hukou* registration from their parents, regardless of where the child or parent lives or works. Before the 1980s, the central government prohibited migration outside of one's *hukou* location without government approval, which was sparingly given. During the 1990s, migration restrictions subsided, but the connection between registration and access to government services remained.[6] An individual who moves across county borders is legally allowed to reside in the new location, but they are treated as "foreigners" with no access to government services.[7]

Internal migrants who move between cities, rural counties, or from rural areas to urban areas lack locally-provided government services where they live and work. The modern *hukou* system was initially implemented as an essential element of the command economy styled after the Soviet system. It became a core element of the dual management system, where urban and rural economies were managed separately (Chan and Wei 2019). Internal migrants face difficulty in accessing schools for their children, health insurance, full transferability of pensions, minimum wage protections, old age care, and even passing their *hukou* status to their children (Vortherms 2019). Those with local, urban registration enjoy a full basket of socio-economic rights whereas ruralites and non-local registrants are second-class or non-citizens in their own country (Cheng and Selden 1994; Solinger 1999).[8]

One important consequence of the *hukou* system is its impact on migration time horizon. Internal migrants without access to government services are more likely to be temporary migrants, returning to their county of registration where they have access to government welfare after working in the city (Fan 2002; Shen 2002; Solinger 1999; Zhu 2007). The exclusion of migrant workers in urban spaces creates institutional inequalities that encourage temporary rather than permanent migration.

Local officials can encourage permanent migration, however, by incorporating migrants into urban services by granting *hukou* transfers. To transfer one's *hukou*, an internal migrant must meet eligibility requirements set by the local government, complete multi-step approval processes with three levels of government review, and relinquish their old status. Like states in the international context managing naturalization processes, local governments define and manage who can obtain local *hukou* through specified pathways modeled after international programs (Vortherms 2023). Table 1 lays out the eligibility pathways for obtaining a *hukou* found in most municipalities. Most people obtain their *hukou* through familial connections, primarily through newborn registration where status is passed from parent to child.

[Table 1 about here]

Since the early 2000s, the majority of *hukou* transfers occurred because of land acquisitions, where local governments re-zone agricultural land to land for urban development. Local governments, at times, offer ruralites displaced by urban development local urban *hukou*, incorporating them into urban services as a form of compensation for their lost land (Cai 2016). But this *hukou* for welfare exchange happens in less than half of land expropriation cases and many who do transfer their *hukou* are subject to naturalization pathways in Table 1, meaning the most desirable candidates are still selected by local government processes (Vortherms 2023).[9] This land-for-*hukou* process evolved into the residence-based pathway, where internal migrants with "stable" lives in urban areas, including legal housing, contracted employment, and social insurance contributions, qualify for transfers.

High-skilled transfer programs, often called recruitment programs, allow individuals with either higher education or formal skills certifications to transfer *hukou*. These can be directly through college graduation or through two other recruitment programs. Firm-sponsored transfer programs operate similar to the H1-B system in the United States. Each year, the local government distributes quota of transfers to different employers based on the city's strategic goals. Employers then use these transfers to recruit new employees or for retention and promotion. Beginning in 2010, many cities began experimenting with point-based transfer programs to move away from the firm-dependent model. Under point-based transfer programs, migrants earn points towards transfer qualifications through their personal education and financial background. Similar to the Canadian Comprehensive Ranking System of skilled immigration recruitment, point-based transfer programs benefit high-skilled workers and those with significant financial resources (Zhang 2012).

Hukou can also be purchased through investment-based programs, such as starting a business, sufficient tax contributions, or purchasing a home. These investment-based programs vary by how much the initial investment must be to qualify for transfer eligibility. The most common program found in China's municipalities is purchasing a house at or above the local market average. Finally, in 2016, approximately 1 percent of the population lacked any *hukou* at all. Most of these so-called "black *hukou*s" are children born in violation of the One-Child Policy who could not be registered without paying fees—or at all in some cases—or children born to internal migrants who face logistical difficulties in registering (Vortherms 2019). After a national-level reform in 2016, local governments opened new means of acquiring *hukou* when previous paperwork was missing.

All of the above migrant pathways can, and often are, manipulated to prioritize the transfer of skilled labor by selecting applicants that meet "hidden" rules (Liu and Shi 2020). Each year, local governments define both eligibility requirements for transfers and a quota for how many migrants can to transfer their *hukou*. Each pathway allows the local government to limit the types of internal migrants eligible, such as allowing local rural migrants to transfer or only allowing migrants from the same province to transfer or ranking applicants by skill level and selecting the most-skilled migrants among them. These limitations are, however, rarely publicized and are regularly obfuscated purposely. Overall, migrants with higher educational attainment and those with significant financial resources are more likely to qualify and transfer (Liu and Shi 2020; Zhang 2012).

Because local governments control the transfer process, they can selectively incorporate internal migrants into local government services or keep them as excluded outsiders. And transferring one's *hukou* is the only way to secure permanent access to local government services (Chan and O'Brien 2019). Some municipalities may offer migrants services—indeed they are expected to since a 2014 national policy on urbanization—but municipal governments routinely find ways to restrict or limit access to services for non-*hukou* holders.[10] A migrant who has full access to locally provided goods and services has better social protections and is more likely to stay in the city even after employment ends. This system provides local governments with a specific tool for manipulating temporary versus permanent migration through access to local government services.

Variation in Foreign Capital and Migrant Integration

Previously studies of urbanization focus on capital accumulation: attracting business and investment to specific spaces. But governments also pursue policies that manage the urbanization of people as well. In his classic work, Tiebout (1956) outlines a general equilibrium where local governments vary in their expenditures with individuals sorting themselves through migration to places with their optimal level of government expenditures. Local governments can encourage or discourage migration by manipulating access and generosity of government services.[11] Even in the non-democratic case of China where the government manages migration to urban centers as part of an urban-rural dual economic system (Chan and Wei 2019), this basic Tieboutian framework can help identify variation in access to citizenship.

China, like most developing contexts, is labor abundant with significant regional inequalities. The influx of foreign capital into urban centers triggers significant labor migration, as un- and under-employed workers flock to cities to earn higher wages. Most urban governments must do very little to encourage the migration that underlies China's foreign economy. Combined with the *hukou* system, it also allowed local development to take off. While workers moved to cities for economic opportunities, the exclusion inherent in the *hukou* system protected local government fiscal reserves (Wang 2005). The *hukou* system meant that local economies benefited from increased labor while limiting obligations to provide local government services.

This system of labor segmentation drives the "controlled" urbanization characteristic of

China's development and is a primary reason China's cities lack the large, informal communities found in India and Brazil. It is the reason why, amongst China's cities, development is not correlated with population size. Empowered with a policy tool that allows the manipulation of the local population and labor market, it is no surprise local governments adjust policy to support local development goals, just like a Tieboutian strategy of manipulating local expenditures to attract labor. The remaining puzzle is under what circumstances local governments actively include more people in government services—increasing local fiscal burden—to encourage permanent migration.

On its own, an influx of foreign capital does not necessarily increase incentives for greater inclusivity to internal migrants. Aggregate FDI creates conflicting incentives for incorporating migrants. On the one hand, FDI is highly correlated with economic development in China's cities (Zhang and Felmingham 2002). Economic development, especially that driven by capital sourced from outside of the local state, increases resources available for redistribution. Yet because FDI is correlated with migration and urbanization (Patra 2019), greater FDI also increases demand for government services with more migration. While development increases the resources available to local governments, economic development alone may not be sufficient to overcome the costs of migrant incorporation. As internal migration increases, a city that hosts a large migrant population faces higher demands on their resources, leading to greater local chauvinism—protecting local resources for local populations. In these cases, all else equal, local governments benefit from excluding migrants from government services. Because of these mixed influences of FDI on local government interests, the first hypothesis is that

> (H1.) Aggregate FDI will have no affect on access to government services for internal migrants.

To balance both greater resources yet greater demand, the local state benefits from temporary migration to benefit development. Local governments can exclude internal migrants from government services to encourage short-term migration. By creating barriers, ranging from increased administrative burdens for registering for services to outright denial of access, local governments keep migrants as outsiders. Without access to locally-provided pensions or housing subsidies, local migrants are more dependent on their employment. When that employment dries up, without access to supportive government services, migrants are more likely to return home, saving the local government from having to care for them. From the perspective of the local government, this temporary migration helps protect local resources. This type of temporary migration is particularly attractive when foreign investment is efficiency-seeking—when investment specifically enters a market to reduce the cost of production (Dunning 1998). In the Chinese case, this is particularly true of low-skilled, low-value added manufacturing.

Excluding all internal migrants from government services, however, can undermine economic development. The transience of internal migration can increase labor turnover within firms and can prevent the capture of all benefits of foreign investment. If a foreign-invested firm depends on high-skilled workers, the local labor market must be able to meet the demand for labor. While local governments can increase expenditures to develop human capital through investment in education, attracting and keeping high-skilled migrants is the fastest way to adjust the local labor market.

High-skilled workers, in particular, create additive economic benefits beyond their specific employment. Employees of foreign-invested firms can create spillover to domestic enterprises, where experience in a foreign firm is transferred to future jobs in the same locality (Kemeny 2010). But this benefit of technology transfer requires local retention of skilled workers (Todo *et al.* 2009). Local governments can incorporate internal migrants into local welfare systems to increase the likelihood of permanent migration because migrants with access to government services are more likely to stay permanently (Xie *et al.* 2020). Because of its exclusivity, transferring one's *hukou* is akin to full local naturalization. This requires migrants to relinquish their previously held *hukou* and any rights they had in the previous jurisdictions.[12] Thus transferring one's *hukou* makes temporary migration costly and encourages permanent settlement.

The benefits of incorporating high-skilled migrants to both maintain valuable FDI contracts and to capture spill-over effects of the foreign economy depend on the skill-dependence of foreign production. This leads to the second hypothesis:

> (H2.) FDI driven by firms dependent on high-skilled workers increases access to government services for internal migrants.

Incorporating migrants into local government services is a long-term commitment to provide citizenship rights. Yet many FDI flows are ephemeral. Many firms with high ambitions fail to fully establish production. In 2018, nearly 30 percent of all newly established multinational corporations and their subsidies in China closed their doors after one year of establishment (Vortherms and Zhang 2021). While attracting investment through developing the labor market may be appealing for local governments, new firms that come in and out of the local market are unreliable. Granting internal migrants with unreliable employment *hukou* and thus permanent access to government services could increase local government burden when they become unemployed. Instead, the local government would prefer if these migrants returned home after the end of their employment. Well-established firms, on the other hand, with a long track record in the local market are reliable employers. Their workers are less likely to depend on safety-net government services and provide protection for the local government to extend services.

Finally, the above hypotheses depend on a market-based logic. With market-driven development, access to government services is used to attract and maintain labor migrants to increase needed supply of workers, following a Tiebout-ian logic. But in an authoritarian context, granting access to government services is not purely about advancing economic development incentives. Instead, it can follow an output legitimacy logic, where governments provide selective redistribution to ensure support (Huang 2020); a coercive logic when government services coerce and co-opt rivals (Albertus *et al.* 2018); or a repressive logic when targeting "trouble making" populations (Pan 2020). These other dynamics of authoritarian redistribution are important elements of understanding overall redistribution and are certainly one part of the urban benefits story. For the purpose of this analysis focused on globalization's impact on access to government services, I hypothesize regional variation in when economic variables play a larger role. Because the relationship between foreign investment, migration, and labor markets follows a market-based logic, the relationship between them should be the strongest where market forces are larger players in the local economy.

In the Chinese context, market forces have played a larger and longer role in both economic development and local government policies in eastern China than in central and western provinces. Development policies historically varied, quite purposefully, across China's eastern seaboard, central provinces, and western borderlands. During both the Mao (1949–1978) and the reform (post-1978) periods, central-directed development policies varied across these regions (Fan 1995). Since Reform and Opening Up in 1979, market forces played a larger role in eastern provinces than in central China or the western provinces, with eastern cities implementing local market reforms first and opening up to international trade and investment before other regions.[13] In these provinces, where economic development is largely driven by market forces, the connection between foreign investment and access to government services should be the strongest. Therefore, hypothesis 3 states:

> (H3.) Market-based relationships between investment and access to government services will be the strongest in eastern municipalities compared to other regions.

Skill-driven investment leading to greater expansion of social welfare is theoretically not dependent on the foreignness of the capital. I argue that foreign investment is a most-likely case to identify the above hypotheses. First, foreign capital, compared with domestic capital, creates greater positive externalities for investment in human capital. Foreign investment and broader engagement with the global economy increases incentives for human capital investment because global markets increase skill premium without putting pressure on local wages (Ansell 2008). In autarky, the balance between skill investment and wage competition may hinder investment in human capital, but international engagement opens the market for labor, allowing wage increases without necessarily affecting wage levels at the low end of the spectrum. Second, FDI often depends on dense networks of labor in different ways from domestic investment (Lin and Liaw 2000). This creates greater incentives for the investment-labor matching mechanisms presented in the hypotheses. Third, foreign investment creates positive externalities for technology transfer, especially when foreign investment is skill-intensive. Existing research shows that technology transfer from one firm to another, from the foreign industry to domestic industry, only occurs when there are sufficient human capital levels locally, i.e. skilled labor (Acemoglu 2003; Feenstra and Hanson 1997). While technology transfer is likely to occur when a wealthy area invests in an underdeveloped area, such as a Shanghai firm investing in a subsidiary in Deyang, Sichuan, technology gains from foreign production are marginally more significant in terms of potential gains. Existing research shows that the more "foreign" a firm is, comparing firms invested from Hong Kong, Taiwan, and Macau versus other foreign invested firms, the greater the technology spill over (Buckley *et al.* 2007).

Finally, foreign investment provides a most-likely case for analysis because it aligns with expected demand for *hukou* from skilled migrant workers. Local government regulations alone do not dictate *hukou* transfers. A variety of local, household, and individual factors influence migrant demand for *hukou* (Chen and Wang 2019; Gu *et al.* 2020; Li and Liu 2020; Vortherms 2024). Foreign firms pay higher wages for skilled labor—and specifically not for unskilled labor—than domestic firms, driving up demand for employment in these firms (Zhao 2001). While jobs in state-owned enterprises are often the most sought after because of their stability and generous benefits, many migrants are locked out of the state-owned sector because many state-owned enterprises limit the number of non-local employees they can hire.[14] Additionally high-skilled labor mobility is more influenced by local government amenities than low-skilled labor mobility (Gu 2021), suggesting if local government expand access to local government services through *hukou* transfers to encourage foreign investment, high-skilled workers are the most likely to respond. Because *hukou* transfer is the result of both government provided "supply" and migrant demand, supply driven by foreign investment is most likely to correlate with migrant demand and result in greater expansion of access to welfare.

Regardless, while foreign investment is a most likely case for these trends, this theory does not preclude other forms of skill-dependent capital from influencing *hukou* policy. If disaggregated data on research and development in firms becomes more widely available, this would be an additional test of the proposed theory.

Methods and Data

To identify the relationship between foreign investment and access to government services, I implement a series of fixed effects models on data from 319 of China's 333 municipalities from 2014 until 2019. I focus on the municipal (prefecture) level because this is where the majority of *hukou* policies are made (Vortherms 2021). For inclusion in the sample, municipalities had to have at least some foreign investment and report population data. A total of 319 of 333 municipalities met these criteria. Most of the missing municipalities either have no FDI or are ethnic minority areas without population statistics, such as Tibet. A table of descriptive statistics is available in the appendix.

Dependent Variable: Access to Government Services through *Hukou* Transfers

The key dependent variable for the analysis is expanded access to government services for internal migrants. Expanding access to urban government services is the primary way local governments encourage permanent migration rather than temporary migration. I capture expanded access in two measures: the estimated net number of transfers of non-local migrants and the size of the urban benefits population.

How many migrants are granted *hukou* each year is not provided by local governments consistently across the country. Without a direct measure, I estimate the net number of migrants who gain access to government services based on growth in the official *hukou* population of every municipality. Each year, county ministries publish official population data, including the *hukou* population—the number of people with local household registration entitled to government services. Change in the *hukou* population depends on both natural growth—births minus deaths—and the granting of *hukou* to internal migrants. I estimate the net number of people who gain access to *hukou* as the change in official *hukou* population not due to natural growth. This indicator estimates the number of non-local migrants who gain access to local urban benefits.[15]

This statistic measures net transfers, rather than isolating in-transfers, and captures trans-municipal migrants.[16] Those who move from the local countryside to the urban center are missed by this measure. To provide a holistic picture of the urban population with access to benefits, I estimate the urban benefits population. Most cities report urban population (*chengzhen*) that includes locally registered people and migrants who have lived there for at least six months based on an annual survey. I estimate the urban benefits population as the number of people living in urban areas minus the estimated migrant population.[17] Figure 1 presents the average net hukou transfers in China's municipalities and the average size of the urban benefits population.

[Figure 1 about here.]

Ideally, I would be able to measure *which* migrants are benefiting from transfers to isolate the targeting of skilled labor. Unfortunately these data are not available systematically across the country. Previous research, however, emphasizes the skill bias in people who have been able to transfer their *hukou*. Local government policies exhibit significant bias in skill premium for transfers, allowing local governments to selectively include high-skilled workers in transfer programs (Zhang 2012). In Beijing, for example, while 15 percent of migrants have a college degree, 30 percent of migrants who transfer their *hukou* hold a college degree. Similarly, those employed in technology and research and advanced business service sectors are over-represented in the transfer population compared with the migrant population (Liu and Shi 2020). Therefore, it is relatively safe to assume that the majority of *hukou* transfers go to higher-skilled migrants.

An alternative measure for the expansion of access to welfare would be the integration of internal migrants into welfare services without *hukou* transfer, such as in Wang *et al.* (Forthcoming) or greater spending on welfare programs more likely to benefit internal migrants with or without *hukou* transfers, such as the expansion of employment-based pensions in Yang (2021). I focus on *hukou* transfers because this form of welfare expansion is more permanent and targeted than more either inclusive welfare policies or better funding for employment-based welfare programs. Once granted, *hukou* represents a longer-term commitment on the part of the local government and is less sensitive to more regular shifts in local budget priorities.

Measuring Variation in Foreign Investment

To disaggregate skill dependence of foreign-invested firms operating in China, I utilize the Foreign-Invested Enterprises in China (FIEC) Dataset. The FIEC includes registration data for all foreign-invested enterprises registered with the Ministry of Commerce in China. Registration data include firms' industry, location, foreign investor, domestic investor for joint ventures, and business operations. Altogether, the FIEC includes more than one million registration reports for more than 400,000 foreign-invested firms operating in China between 2014 and 2019.

Previous measures of skill level depend on aggregate differences across firms. For example, foreign investor is expected to be correlated with skill dependence, with US firms depending more on high skilled employees than Japanese firms (Todo *et al.* 2009). The dependence on aggregate measures of skill dependence derives from the use of aggregate data. FDI by sector and country of origin is relatively easy to identify through government statistical yearbooks. The FIEC database allows a more nuanced measure of skill dependence because of the micro-level data available.

To identify skill dependence, I apply a random forest machine learning model to estimate firms' dependence on skilled labor. Random forest models are commonly used techniques for classifying large-n data. With the assistance of research assistants, we classified over 4,000 firms through 10,000 reports from the FIEC database, approximately one percent of all firms in the database. This training dataset represents a random sample of firms with probability proportional to size of capital investment that is representative of all geographic regions covered by the FIEC database. The research team used firm names, industry, and business operations to rate the probability of relative firm dependence on skilled labor on a four point scale. Reviewers also recorded a certainty score for their rating. Skill dependence was operationalized on the likelihood that most employees would require either a college education or a form of professional or technical certification.[18] From the skill rating weighted by certainty scores, I calculated a continuous estimate of skill dependence. The top quartile of firms were defined as high-skilled dependent.

Through the coding process, we also generated a high-skilled dictionary for content analysis. Words and phrases that signaled greater need for skilled workers, such as research and design, scored high on skill dependence. Words that signaled production, warehousing, or transport of non-technical consumer goods, on the other hand, scored low on the high-skill dependence scale. The content analysis dictionary was then used to create an index of skill dependence across all firms.

To expand from the training dataset, the analysis uses a random forest model to classify the remaining firms across China's municipalities. The random forest model includes firm country of origin (OECD or non-OECD), location (urban district/city or rural county), industry skill rating, and skilled content analysis score.[19] This firm-level data is then aggregated to the municipal level, where I calculate the amount of registered capital in skill dependent firms.

FDI contracts are highly concentrated in coastal provinces, including in Jiangsu province north of Shanghai and in Guangdong province in the southeast (Figure 2, panel a). Municipal-level foreign firm skill dependence as a proportion of local foreign capital, however, is more scattered throughout the country with many smaller municipalities in the central and western provinces with fewer firms but more of which are dependent on higher skill (panel b). Three cities in the Pearl River Delta provide an illustrative example of skill dependence across municipalities (Figure 2, panel c). Within Guangdong province, Shenzhen—home to China's "Silicon Valley" as well as one of the busiest ports in the world—has the highest high-skill dependence with 54 percent of foreign investment going to skill-dependent firms. This balance represents both the high-tech industry and the electronics and consumer goods manufacturing that the municipality is known for. Skill dependence in Guangzhou, the provincial capital with significantly more agricultural production than Shenzhen, is 38 percent. Between these two large cities is Dongguan, a municipality known for low value-added manufacturing of consumer products.[20] The municipality's skill dependence is one of the province's smallest at only 6.7 percent. Unlike its neighbors, Dongguan's foreign-driven economy relies on cheap labor necessary for fuelling efficiency-seeking foreign investment. The resulting picture is one of significant variance in the dispersion of skill dependence in the foreign economy. Across the pooled sample, on average 27 percent of registered foreign capital is in firms dependent on skilled labor.[21]

[Figure 2 about here.]

There is similar variation in other regions of the country, too. In Sichuan, for example, many municipalities have a high skew in their skill dependence relative to the amount of foreign capital. Chengdu, the provincial capital, has a wide range of foreign firms with a skill dependence rate of approximately 60 percent. Chengdu's skill-dependent firms look similar to Guangzhou's, but Chengdu being an inland city has significantly fewer foreign-funded large manufacturing firms. To Chengdu's southeast is Ziyang, a municipality that also has a significant amount of foreign investment, especially in the districts and counties that border Chengdu, but it's dependency ratio is 1.8 percent. Car-part manufacturing and agricultural production firms dominate Ziyang's foreign economy, both rating low on skill dependence. In contrast, Ngawa Tibetan and Qiang Autonomous Prefecture (known as Aba), to Chengdu's northwest has a relatively high ratio at 27 percent. While one might expect this underdeveloped, minority region to have a lower skill dependence, of the 12 foreign firms operating in Aba, there are three large solar electricity development and consulting firms and the relative size of their registered capital compared with the smaller, non-skill dependent firms, increases the skill dependency measure.

The FEIC dataset also includes details on how long a firm has been operating in a given locality. Newer firms, those with more recent establishment years, are more likely to depend on skilled labor (Figure 3). Of firms still operating and established throughout the late 1980s and 1990s, less than ten percent depend on high-skilled workers. Around the mid 2000s, more firms began depending on skilled labor. Of firms established after 2016, approximately 40 percent depend on skilled workers. This shift reflects the changing nature of investment in China, from large, labor intensive export oriented firms to those with greater engagement in technology and business services, like consulting.

[Figure 3 about here.]

A potential alternative measure of local economic dependence on skilled labor would be local research and design spending. Spending on Research and design encapsulates government, institutional, and enterprise spending, both foreign and domestic, on technology advancing projects. Unfortunately these data are not available at the municipal level and using provincial level data ignores significant variation within provinces. Local government science and technology spending is available at the municipal level. This represents a small portion of research and design spending and disproportionately benefits universities and research institutions through grants and off-budget financing whereas commercial sources of research and design primarily benefit firms directly linked to labor mechanisms (Boullenois *et al.* 2023). Investing in a university increases the skill quality, but not necessarily quantity, as university enrollment numbers are unlikely directly tied to higher funding and are largely set at the provincial level. This makes science and technology spending a weak potential measure of local economic skill dependence. In the final models, I include science and technology spending as a proportion of total local spending as a control variable.

Important controls for the analysis capture economic development variables at the municipal level. Models include local GDP (logged), exports (logged), relative size of the primary industry, government expenditures (logged), the registered population, and the census-estimated migrant stock. These control variables are expected to influence the ability of a municipality to incorporate migrants and are available from the Regional Economic Statistical Yearbook of China.

Models

The analysis below presents a series of panel data models with location and time fixed effects. Because many of the other political determinants of authoritarian redistribution are time or location dependent, such as geographic importance due to natural resources, fixed-effects models help control for these other factors. In the primary models, I include a lagged dependent variable to reduce time based correlations and all independent variables are lagged by one year. To evaluate hypothesis 1 and 2, the key independent variables of interest are aggregate registered capital in foreign-invested enterprises and proportion of aggregate registered capital in skill-dependent foreign-invested enterprises, respectively. Aggregate registered capital in foreign-invested enterprises is expected to have a null effect on migrant integration whereas registered capital in skill-dependent foreign invested enterprises is expected to have a positive and significant effect on migrant integration. Finally, for hypothesis 3, I replicate the above models limiting the sample to eastern and non-eastern municipalities. All measures of capital for are measured as proportions of total registered foreign capital calculated from the FIEC data.

Results: Foreign Investment and Urbanization Outcomes

At the aggregate level, foreign investment has mixed impacts on the incentives to expand government services (H1). On the one hand, greater levels of foreign investment create opportunities for industrial upgrading and a wider market for labor, increasing incentives to invest in human capital. On the other hand, localities seeking to keep labor costs low to be competitive for investment contracts are less likely to expand the formal urban population, protecting local budgets. Across all models, aggregate registered foreign capital is negatively correlated with both measures of access to government services (Table 2). As foreign capital grows, fewer *hukou* transfers are granted and the smaller the urban benefits population is. This negative relationship between overall foreign capital and access to urban benefits suggests efficiency beats out the potential for greater returns to human capital.

[Table 2 about here.]

The negative relationship between foreign capital and access to government services suggests mixed support for the first hypothesis that aggregate levels of foreign investment does not support expanded access to government services. Increased foreign capital is not increasing access to government services, and, in fact, the opposite appears to be true. The greater foreign investment, the smaller the urban benefits population and fewer urban transfers. As a municipality grows its foreign investment portfolio, it restricts access to urban services, encouraging more temporary migration than permanent migration.

The second hypothesis posits that when foreign capital depends on skilled workers for production, incentives shift to support expanding access to government services to encourage permanent migration. To capture skill dependence, the second set of models measure the correlation between high-skilled dependence, measured by registered capital in skill-dependent firms as a proportion of total registered foreign capital, and the two measures of access to urban services (Table 2 column 2 and 6). For both measures, the greater the skill dependence of foreign capital, the greater access to government services. Greater dependence on skilled labor correlates to more expansive access to urban government services (H2). This holds both for expanding access to urban services through *hukou* transfers and the total size of the urban benefit population. As skill-dependent capital grows, especially in markets with relatively little skill dependence, local governments expand the number of *hukou* transfers and the size of the urban benefits population, suggesting greater permanent migration with more skill-dependent investment.

As a robustness check, I repeat all analyses limiting the measure of foreign capital to established firms—those who have been in operation for at least a year. Approximately 20 percent of foreign firms report in their first year but never report again, exiting the database and presumably the locality. With a high turnover rate, newly-established firms should not affect access to services. Narrowing the sample to established firms removes this variation. Table 2 columns 3 and 7 show a positive correlation between skill dependence in firms established at least one year prior for both measures of the dependent variable. Moving from no established skill dependent firms to having ten percent of foreign investment in established skill-dependent firms increases net *hukou* transfers by approximately 6,000 and increases the urban benefits population by approximately 11,600 (Figure 4). The correlation is stronger for the urban benefits population, which incorporates both non-local and rural migrants.

[Figure 4 about here.]

Science spending, the alternative measure of local economic dependence on skilled labor, is positive but not statistically significant.[22] As discussed above, this indicator is a weak proxy for the proposed mechanisms, making the non-statistically significant result expected.

Regional Analysis

Because of the different histories with the foreign economy and experience with market forces, the connection between foreign investment and its variation and access to government services should be the strongest in more market-oriented regions. To identify regional variation, I implement a subsample analysis separating out municipalities in eastern provinces and those in central and western provinces. The marginal effects of the key independent variables are shown in Figure 5.

[Figure 5 about here.]

Eastern municipalities drive the aggregate findings presented above. Total registered foreign capital is negatively correlated with both dependent variables. High-skilled dependence, both per total registered foreign capital and that in established firms, increases *hukou* transfers and the size of the urban benefits population. Eastern municipalities see higher rates of foreign investment in general and have a longer experience with market-based mechanisms, increasing the potential for market-based decisions directing labor market manipulation. Additionally, eastern municipalities are also where the measure of *hukou* transfers best captures in-migration because eastern municipalities experience less out-migration.

Other Determinants of Access to Government Services

Across the various control variables, there are different effects based on the dependent variable of interest and the sample. For *hukou* transfers, the granting of urban benefits to non-local migrants, migrant stock increases net transfers in the aggregate models. This is to be expected for a net measurement of transfers. Also at the aggregate level, municipal government expenditures is not significant, but in the regional analysis, there is divergence. In eastern municipalities, government expenditure is positively correlated with *hukou* transfers. More fiscally generous municipalities also provide more net transfers. The opposite is true in central and western municipalities. As local government expenditures increase, net transfers decrease. This result provides additional evidence of divergent economic development policies across China's regions and suggests that *hukou* transfers represents different political economic forces in different regions of China.

While migrant stock is positive and significant for aggregate models of the urban benefits population, the relationship varies across regional subsamples. In eastern municipalities, increasing migrant stocks are negatively correlated with the size of the urban benefits population while in central and western municipalities, the reverse is true. This may be because cities that have large migrant populations, most of which are in the eastern provinces, feel they need to protect local resources, most of which are better funded than in their central and western counterparts.

Discussion

Economic globalization has the potential to increase economic growth, advance human development indicators, and transform economies (Lheem and Guo 2004; Lin and Liaw 2000; Tian *et al.* 2004). It also has the potential to increase inequality and shift distributional outcomes of government spending (Ha 2012; Szabo *et al.* 2018; Zhu and Wan 2012). These countervailing forces stem from the highly varied processes within globalization itself and the reaction, or lack there of, of governments attracting global economic ties. This analysis focused on one specific connection between globalization and distributional outcomes: the relationship between foreign firm investment and urbanization of China's people. The highly institutionalized context of China allows a clearer identification of how economic processes influence access to government services, linking not only globalization with migration, but with inclusion in government services and welfare outcomes.

Fixed effects models presented above highlight the importance of disaggregating foreign investment when identifying the distributional consequences of globalization. Foreign capital encapsulates a wide range of business practices and labor needs: in short, not all capital is created equal. And the types of capital and investment activities influence how governments attract and respond with labor and welfare policies. This analysis explored two forms of variation: skill-dependence and time horizon. Throughout the models, investment in skill dependent firms increases access to urban government services. By formally and permanently integrating internal migrants into local welfare programs, local governments create greater inclusivity and potentially lower inequality when hosting skill-dependent foreign capital. These results are driven by municipalities in eastern China. The relationship between foreign capital and welfare expansion through *hukou* reform does not hold in central regions. It is possible that in these regions, other sources of skill-dependent capital are more important than foreign capital, which plays a smaller role in the local economy.

The arguments presented in this paper do not preclude other forms of welfare expansion—other measures of the dependent variable—such as extending welfare services outside of the *hukou* system. More and more municipalities grant welfare services to internal migrants without local *hukou* (Wang *et al.* Forthcoming) based other local political economic conditions, such as labor market structures (Yang 2021). Similarly, foreign investment is not the only driver of development or of *hukou* policy variation (Vortherms 2024). Other forms of skill-dependent investment from domestic sources also have the potential to significantly influence *hukou* policies and should be an area for future research. The specific contribution of this paper is to show variation in foreign investment driven development and resulting welfare expansion through *hukou* transfers. Future research should test these mechanisms in the more difficult case of domestic investment to evaluate under what conditions the hypotheses hold outside of the most likely case of foreign investment. Additionally, more research is needed to understand different forms of welfare expansion—namely the granting of *hukou* and the integration of internal migrants into welfare systems—and whether they act as substitutes or compliments.

Another aspect of research deserving greater attention is the role of demand for *hukou* in expanding services. A growing body of literature highlights the variation in demand for *hukou* (Chen and Wang 2019; Gu *et al.* 2021; Vortherms 2024), which impacts the effectiveness of government policies targeting permanent migration. Existing research suggests skilled migrants are more sensitive to local amenities, such as welfare generosity (Gu 2021), suggesting skilled worker demands for *hukou* should work in concert with the local government incentives focused on here. Without demand for local services, more liberal policies will not result in greater welfare expansion. The interplay of government policies and migrant demand for *hukou* is an area ripe for future research.

This research has implications for how we understand the the relationship between economic globalization and distributional outcomes through urbanization processes in China and other non-democratic contexts where governments manipulate their local labor markets. Skill-dependence among China's foreign-invested firms is growing, with more firms opening in China for research and development compared with two decades prior when most FDI went to low-value added manufacturing for export. This creates conflicting incentives between different generations of foreign capital. Older, more established firms have different needs than newer firms, and their relationship with local governments also change over time as domestic industrial policy shifts (Chen 2018). This connection between variation in capital and variation in labor needs over time highlights the importance of how our measures capture dynamic processes. Many studies focus on new contracts and the attraction of FDI, yet greater attention is needed to the longer-term relationship between foreign-invested firms and local governments.

The analysis presented here provides a first attempt to understand how variation within foreign investment affects access to government services in China. Within the Chinese case, lack of correlation between timing of new contracts versus established firms may be due to the short time horizon of local leaders. While firms that operate in a local business for many years are likely to have significant connections with local bureaucratic leaders, the top local leaders spend relatively little time in a given municipality, which shifts their focus from older firms to the attraction of new firms. More research is needed in the systematic ways in which local governments adapt and shift policies over time, relative to variation in the foreign capital they host.

Finally, this analysis highlights the continued need to ask *who* benefits from globalization and government policies. If skill-dependent foreign investment is necessary for expanded access to government services, those with the highest skill levels are most likely to benefit from labor market management. The majority of China's migrants will remain excluded from government services, with "improvements" in household registration reform captured by those who need it the least.

The results from this analysis help explain the experience of China's 375 million internal migrants who face barriers in accessing government services where they live and work (National Bureau of Statistics 2021). Additionally, implications from this research are directly applicable to other developing contexts that operate urban population controls, such as Vietnam and the former Soviet Central Asian states. These states operate internal migration regulations very similar to the Chinese system, with many, such as Kyrgyzstan, implementing even stricter internal migration controls. Beyond these direct comparisons, the implications of this research extend to other developing countries where local officials seek to manage urbanization through pro- or anti-migrant policies in the face of development.

Data Availability Statement:

Data Availability Statement: Replication materials are available in the *Journal of Public Policy* Dataverse at https://doi.org/10.7910/DVN/9VSJYC

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Notes

[1]See the edited volume Glaeser (2010) for a discussion of the economic benefits and function of agglomeration economies.

[2]Municipalities, also known as prefecture-level cities, are large geographic areas including an urban core with rural counties and sometimes satellite cities surrounding it. Chinese municipalities are analogous to US counties.

[3]On the political integration of internal migrants, see Gaikwad and Nellis (2021).

[4]See, for example, Desai and Rudra (2019), Menendez (2016), Rudra (2008), and Rudra and Tobin (2017).

[5]Research on globalization and migration generally focuses on international migration whereas domestically, the frame shifts away from migration and towards labor as an interest group. See, for example, Mosley and Singer's (2015) review article on this dichotomy of labor at either end of the capital spectrum.

[6]For an overview of the *hukou* system and its historical origins, see Cheng and Selden (1994), Chan (2009), Vortherms (2021) and Wang (2005).

[7]Counties in China are subdivisions of municipalities, meaning they are similar to districts whereas the larger municipality is analogous to US counties.

[8] Some argue the *hukou* is similar to but more discriminatory than European citizenship (Kovacheva *et al.* 2012). As a German national moves to France, they are not automatically French citizens, but enjoy basic protections from European citizenship. Chinese citizens can move internally within China like the Germany-to-France migrant, but the higher-level Chinese citizenship identity provides little to no protections. So while a German citizen working in France may enroll their child in a French school, an internal migrant from Wuhan cannot enroll their child in a Beijing school, for example.

[9]Based on data from the China Household Income Project Survey, 2013.

[10]Interview with *hukou* detective, 2014; Interview with migration researcher, 2019.

[11]A large body of literature studies this at the international level. See, for example, work by Gary Freeman.

[12]Additionally, almost not municipality has "right of return" for migrants who leave. To reacquire one's old *hukou*, they must fully qualify and process like any other migrant.

[13]The nature of government services vary regionally, as well, with export-oriented local economies spending more on education (Ratigan 2017).

[14]Interviews with a central state-owned enterprise employee, Beijing 2016; group interview with local state-owned enterprise human resource managers Guangdong 2013.

[15]China's population data is notoriously subject to manipulation. There were multiple instances where municipalities would report the addition of 3 million new residents in one year then 3 million fewer residents one or two years later. These dramatic shifts are more likely the result of either errors or data falsification than actual changes to the population. When a city reported an expansion more than two standard deviations different from the city's average transfer number and lost approximately the same size population a year or two later, I smoothed these observations with a linear estimate.

[16]After 2014, identifying rural residents who gain access to urban benefits became significantly harder because of changes in how urbanization statistics are reported locally.

[17]I use census data to estimate the number of migrants in each municipality. The migrant to local population is highly correlated across census and census sample years ($\rho = 0.92$), suggesting a relatively stable migrant population in cities across years. I use a linear prediction based on the intermittent census data to estimate the migrant population in each city.

[18]China runs a multi-tiered professional certification program where skilled workers can obtain certifications are different levels commensurate with their education and on-the-job training.

[19]Model specifications were chosen to minimize out-of-bag and validation errors. A discussion of this process is available in the appendix.

[20]See, for example, Zhang, Sidong. February 10, 2021. "Dongguan's multinational factories from Gillette to Samsung give it an edge as a manufacturing hub for the bay area." *South China Morning Post.* https://www.scmp.com/business/china-business/article/3121167/dongguans-multinational-factories-gillette-samsung-giv

[21]One municipality had complete dependence on high-skilled investment—Huangnan Tibetan Autonomous Prefecture in Qinghai province has only one registered firm. Seventeen municipalities have at least one year with no high-skilled capital.

[22]It is just outside of statistical significance for the *hukou* transfers dependent variable ($p > .127$).

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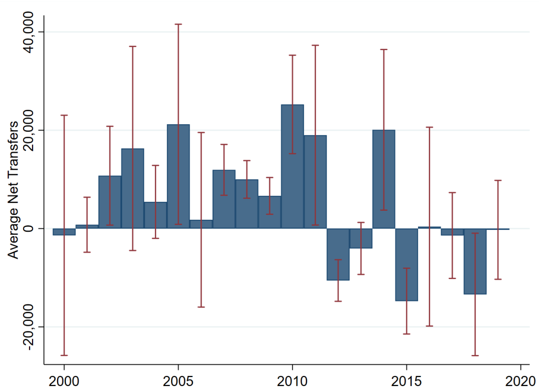
Tables and Figures

Table 1: *Hukou* Acquisition Pathways

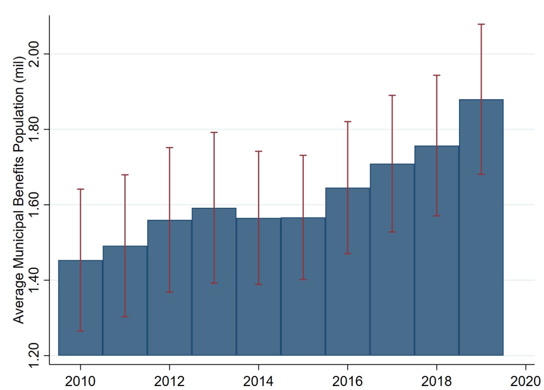
Family	- Newborn children - Minor children transferring to parent's location - Parents transferring to children's location - Elderly transferring to their children's location - Spousal transfer
Residence	- Long-term (3-5 year) residence program, often with housing, employment, and social insurance requirements
High-skilled	- Education-based transfers for graduates, with or without employment requirements - Firm-sponsored transfers for talent acquisition - Point-based transfers
Investment	- Investment in firm - Housing purchase
Amnesty	- Granting of *hukou* to those without previous registration because of missing paperwork or One-Child Policy violations ("black *hukou*")

Figure 1: Municipal Average Net Integration Rate of Non-locals and Urban Benefits Population over time

(a) Estimated Hukou Transfers



(b) Urban Benefits Population



Source: Net integration rate estimated as *hukou* population grown not due to do natural growth. Urban benefits population estimates calculated as the long-term resident urban population minus estimated migrant stock. Based on data from from National Bureau of Statistics data.

Table 2: Fixed Effects Models of Registered Capital and Skill Dependence of Foreign Firms on Estimated *Hukou* Transfers

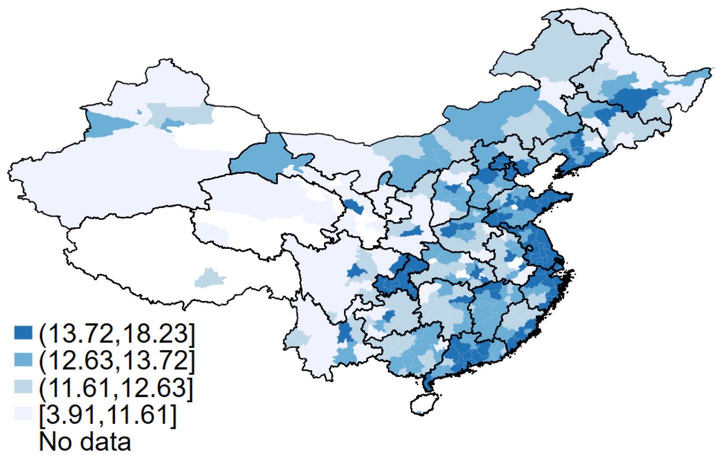
VARIABLES	(1) Hukou Transfers	(2) Hukou Transfers	(3) Hukou Transfers	(4) Hukou Transfers
High-Skill Dependence		84,161**		
		(37,142)		
Established High-Skill (per total)			73,164**	71,015**
			(35,065)	(35,112)
Established Capital (per total)				-28,484
				(25,148)
Reg. Foreign Capital (log)	-12,049*	-13,554*	-13,485*	-15,280**
	(7,299)	(7,316)	(7,321)	(7,490)
Observations	1,420	1,420	1,420	1,420
R-squared	0.029	0.034	0.033	0.034
Number of Munic.	287	287	287	287

VARIABLES	(5) Urban Ben. Pop.	(6) Urban Ben. Pop.	(7) Urban Ben. Pop.	(8) Urban Ben. Pop.
High-Skill Dependence		100,991**		
		(46,876)		
Established High-Skill (per total)			109,404**	108,004**
			(45,163)	(45,590)
Established Capital (per total)				-7,638
				(32,963)
Reg. Foreign Capital (log)	-16,659*	-19,753**	-20,176**	-20,404**
	(9,381)	(9,471)	(9,467)	(9,523)
Observations	1,124	1,124	1,124	1,124
R-squared	0.574	0.577	0.577	0.577
Number of Munic.	238	238	238	238

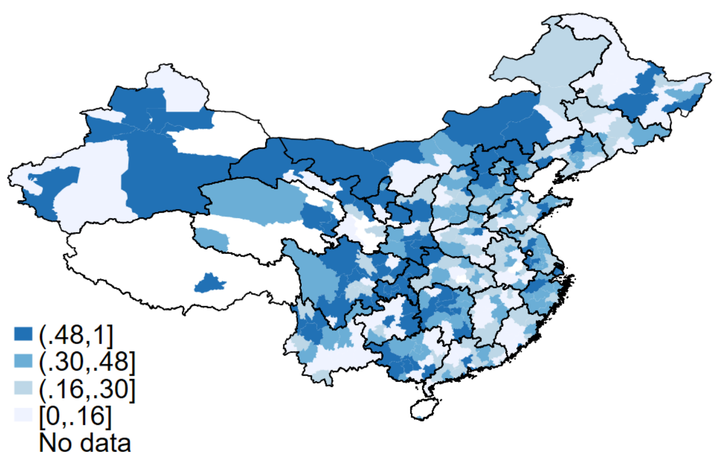
Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$
All models include municipal and year fixed effects, a lagged dependent variable, and controls including exports, local GDP, primary sector as a proportion of GDP, local expenditures, total population, and estimate internal migrant stock.

Figure 2: Geographic Variation in Registered Foreign Capital, 2019

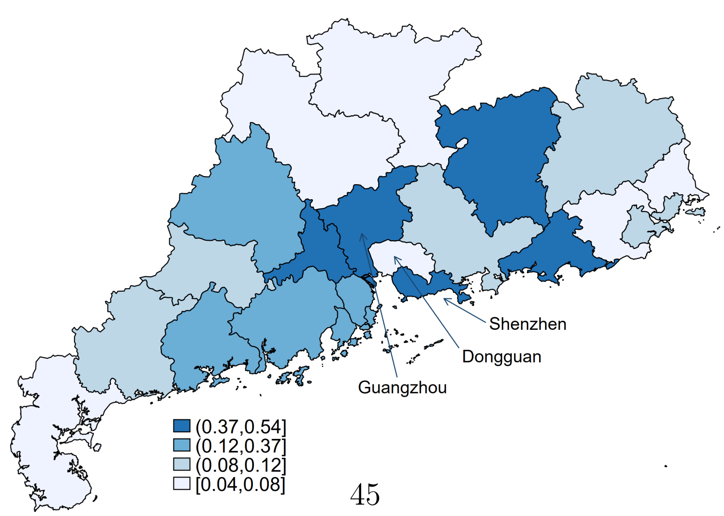
(a) Total Registered Capital (log)



(b) Skill-dependent Foreign Capital (per total foreign capital)

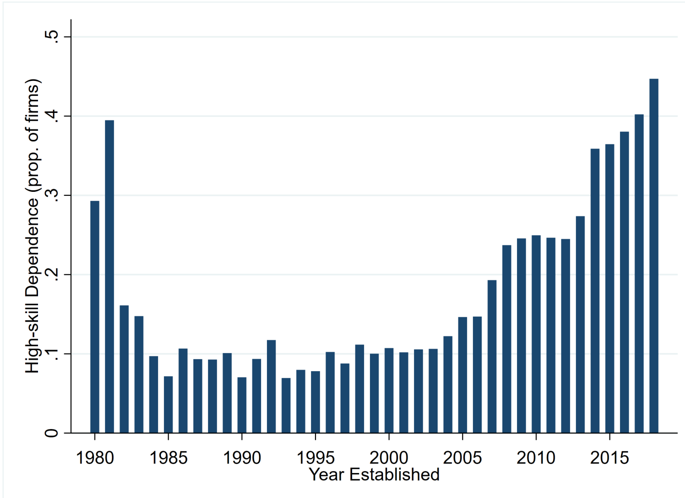


(c) Average Skill-dependent Foreign capital, Guangdong Province



Source: FIEC Database.

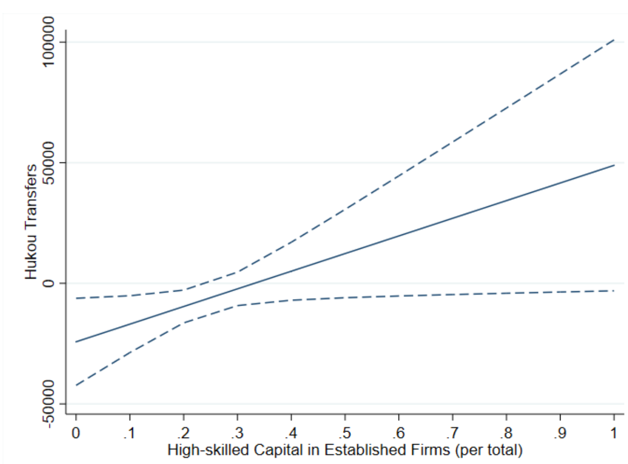
Figure 3: Proportion of Firms Rated as Skill-dependent by Establishment Year



Source: FIEC Database.

Figure 4: Marginal Effects of Registered Capital in Established, High-Skill Dependent Firms

(a) *Hukou* Transfers



(b) Urban Benefits Population

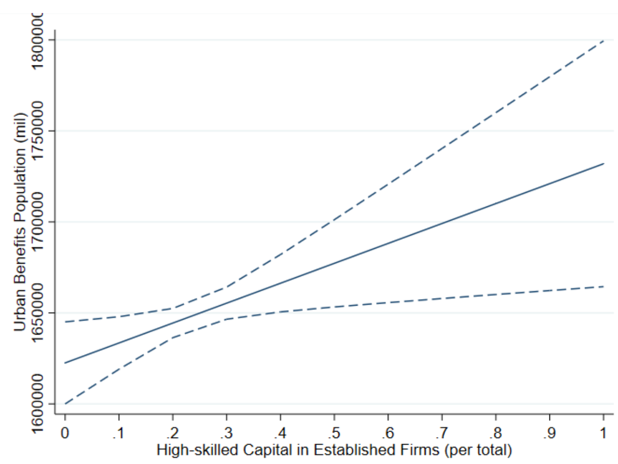
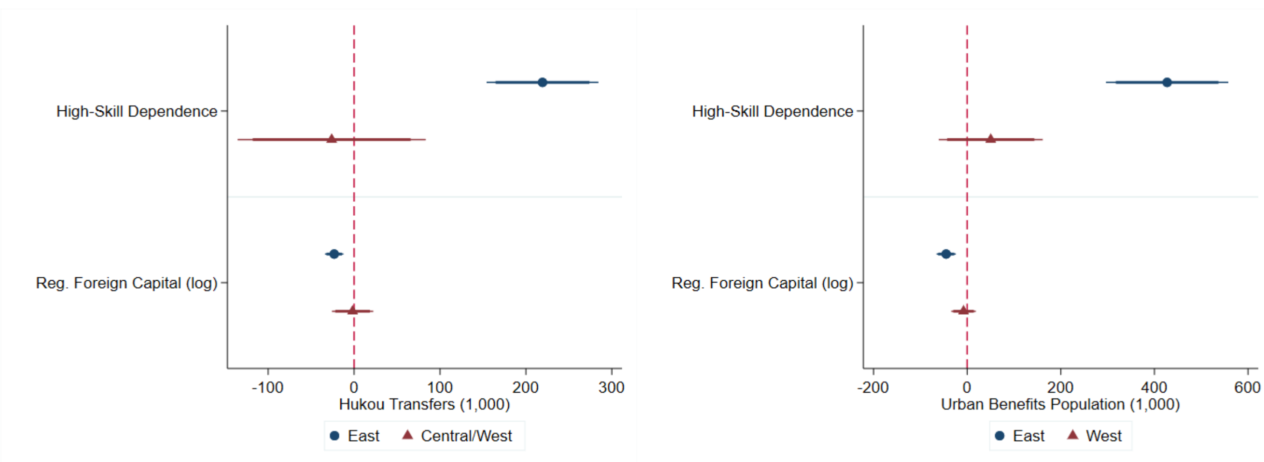


Figure 5: Marginal Effects by Regional Sub-Samples

(a) *Hukou* Transfers

(b) Urban Benefits Population



Based on fixed effects models with municipal controls. Full results tables are available in the Appendix.