

Urban Concentration and FDI: The Case of China vs. India

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We present a simple model to show that urban concentration of developing countries reduces with foreign direct investment (FDI) if the FDI is attracted to their relatively “remote” regions; otherwise, the urban concentration increases. To reduce urban concentration, this paper suggests that developing countries better carries out some favorable policies to improve their “remote” regions’ infrastructure that makes them be more freely accessible to international markets. Thus, the FDI raises demand for local workers and then attracts migration from incumbent megacities, leading to lower urban concentration. The declining urban concentration increases labor supply by reducing commuting costs, hereby improving welfare.

Keywords: *Special Economic Zones, Urban Concentration, China, India*

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I. Introduction

It has been documented that megacities bring up mega problems, such as the “heat island” effect, congestion, increasing pollution, and even massive slums. It has also been observed that most of the megacities are located in developing countries (e.g., Krugman and Elizondo, 1996). Since the huge urban concentration is unhealthy, in this era of globalization, what a developing country could do to resolve the mega problems of the megacities?

There are two strands of the literature address how liberalization affects urban concentration. However, they give mixed results. While the urban concentrations usually occur in the border and coastal cities that are closer to international markets, one strand of the literature argue that trade liberalization enlarges the urban concentrations even more in developing countries (e.g., Brülhart, Crozet, and Koenig, 2004; Crozet and Koenig Soubeyran, 2004; Rauch, 1989).¹

The other strand of the literature presents the opposite view. Theoretically, Krugman and Elizondo (1996) show that trade liberalization helps disperse the megacities.² Empirically, Karayalcin and Yilmazkuday (2015), Grajeda and Sheldon (2015), and Yan and Zhang (2015) show that trade liberalization reduces urban concentration.

Liberalization consists of not only opening the door to trade, but also opening the door to foreign direct investment (FDI). In this current paper, we employ the framework of Krugman and Elizondo (1996) to argue that not only liberalization on trade but also FDI give rises to the mixed results regarding to the impacts of liberalization on urban concentration. We argue that if a country makes more emphasis on infrastructure development in its “remote” cities rather

than its incumbent “megacities”, such that the former is also accessible to global markets easily, the liberalization policies helps bring in FDI to these “remote” cities and then reduce urban concentration. Instead, the urban concentration increases otherwise.

The intuition is simple. As is well known, most of the megacities are located in either the border or coastal regions, nearby exporting ports. Let us refer to them as host cities hereafter. The cities located in the interior are usually smaller, which we shall refer to as remote cities. Due to the easier access to international markets, for imported goods to reach the host city only the international trade costs are incurred. But, for the imported goods to reach the remote cities not only are the international trade costs incurred, but also the domestic transport costs, pushing up the aggregate prices of goods in the remote cities. The opening up to trade increases real wages nationwide, but the effect is more favorable in the host city if the transportation costs are too high. As a result, more workers are attracted to the host cities from the remote cities until their real wages are equalized, thereby enhancing the urban concentration even more. On the other hand, if the remote cities are also able to freely access to international markets if the government makes infrastructure investment there such as building an exporting port, the residents in the remote cities would benefit from a larger marginal reduction in price as a result of the openness, thereby attracting more workers move in and then lowering the urban concentration.

In contrast to current literature, this paper focuses on the impact of FDI on urban concentration. Foreign producers would choose the lowest-cost location to produce their products in order to serve not only the local market, but also their own home market. Since wage costs in the scattered remote cities are usually much lower than in the crowded host cities, the former will be more attractive to FDI if the associated transportation costs are substantially reduced. By specifically aiming at attracting FDI, this paper suggests that developing

countries could make some favorable policies such as establishing Special Economic Zones (SEZs) on their “remote” regions to reduce the trade costs. We argue that, by this way, workers in the remote cities gain disproportionately from liberalization with more increase in real wages compared to those in the host cities. As a result, more workers are attracted by FDI to the remote cities, thus leading to the less urban concentration but, meanwhile, the higher urbanization rate nationwide.

The remainder of this paper is organized as follows. The model is presented in Section 2, where we incorporate FDI into Krugman and Elizondo’s (1996) model. How urban concentration is impacted by FDI is discussed in Section 3. In Section 4, we investigate how liberalization affects urban concentration in China. The second 5 and 6 provide some evidence. The Section 7 concludes.

II. The Model

Considering a world in which there are two countries, one is a developed country and the other is a developing country. The developed country treats the developing country favorably with free trade, while the latter still imposes a tariff against imports from the former. The developing country consists of two locations: a host city and a remote city. There is only one factor of production, labor. Labor supply is inelastic in each country. There is no international labor mobility; however, labor is freely mobile across domestic cities.

In the following, we borrow Krugman and Elizondo’s (1996) framework to set up the model. While Krugman and Elizondo address how opening trade dissolves the giant cities in the developing countries, this current model focuses on how another aspect of liberalization, FDI, affects a developing country’s urban concentration. As assumed in Krugman and Elizondo, production must

take place at a single central point in each city, and each city is long and narrow such that workers are effectively spread along a line. Thus, the workers who live at the most remote location in city j have a commuting distance

$$d_j = L_j/2, \quad (1)$$

where L_j denotes residents in city $j \in \{host, remote\}$. The host city is endowed with good infrastructure that connects it to the exporting port. However, although the remote city parallels the host city, the former is hampered in terms of accessing the exporting port due to its poor infrastructure, so that local transportation costs are incurred when shipping goods.

A worker who lives in a place in a city has to pay rent for the land and the commuting cost of going to work from his place. Each worker is endowed with one unit of labor and, after deducting the time he spends on commuting over a distance $d \leq d_j$, the net amount of labor that he sells becomes

$$l_s = 1 - 2\gamma d, \quad (2)$$

where the exogenous parameter γ denotes the commuting cost per unit of distance. Suppose the wage in city j is denoted by w_j . Apparently, the workers who live closer to the city center will pay less to commute, but will pay an offsetting land rent. Krugman and Elizondo (1996) argue that the land rents always exactly offset the commuting costs. To sharpen the contrast, they assume that workers who live on the outskirts of the city will pay no land rent, but will be faced with the longest distance for commuting. Hence, with (1) and (2), all workers, regardless of where they live in city j , will receive a net wage of $(1 - \gamma L_j)w_j$ in equilibrium.

While population density is the same across a city, the total labor input in city j , net of commuting costs $d_j - \gamma d_j^2$.³ Combining it with (2), we obtain

$$Z_j = L_j(1 - \gamma L_j/2). \quad (3)$$

Hence, the total income of city, including the income of landowners, is

$$Y_j = w_j Z_j. \quad (4)$$

Assume that consumers have a Dixit-Stiglitz preference (Dixit and Stiglitz, 1977) in that they share the constant elasticity of substitution (CES) utility function

$$U = \left[\sum_j C_j^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}, \quad (5)$$

where $\sigma > 1$ is a parameter for elasticity of substitution between any pair of goods. There are a large number of symmetric potential producers in a country characterized by monopolistic competition and free entry that share a similar cost function

$$Z_{kj} = \alpha + \beta Q_{kj}, \quad (6)$$

where Z_{kj} represents the total cost of producing good k in city j and Q_{kj} denotes the total output of good k . As implied in the utility function in (5), each monopolistic producer that faces consumers has a demand function in city j as

$$P_{kj} = A Q_{kj}^{-1/\sigma}, \quad (7)$$

where we simply assume A is a constant parameter for all regions. While all producers are symmetric, we spare the subscript k for convenience hereafter. As implied in the traditional monopolistic competition model with the Dixit-Stiglitz preference, the price of any good produced in city j is given by

$$P_j = \frac{\sigma}{\sigma-1} \beta w_j. \quad (8)$$

In the long run, free entry leads to the optimal output for a representative producer:

$$Q_j = \frac{\alpha}{\beta}(\sigma - 1). \quad (9)$$

The constant output in (9) implies that the number of varieties produced in city j is proportional to its net labor inputs as

$$n_j = \frac{Z_j}{\alpha\sigma}. \quad (10)$$

The domestic transport costs take the iceberg form as $1/\tau$, where $\tau > 1$. When a firm ships goods between cities, the firm incurs the iceberg form transport cost of $1/\tau$; that is, only a $1/\tau$ share of the goods actually arrives. Similarly, the international transport cost incurs the iceberg type trade cost of $1/t$. Remind that there are two cities in the developing country. However, while the coastal port is inherently accessible from the host city, it is not easily accessible from the remote city due to its poor infrastructure. As such, the imported good from the developed country incurs only the international trade cost when being sold to the host city, but incurs both the domestic transportation cost and the international trade cost when being sold to the remote city.

The developed country is also an economy with monopolistic competition and the Dixit-Stiglitz preference, except that its wage rate is much higher than that in the developing country. For simplicity, let's take the developed country as a whole in our discussion. Let's normalize the wage in the developed country to be unity, so that the f.o.b. price of its product is $P_F = (\sigma/\sigma - 1)\beta$, where we use the subscript F to denote the foreign country (the developed country). The number of product varieties produced by the developed country is given by $n_F = Z_F/\alpha\sigma$, where $Z_F = L_F(1 - \gamma L_F/2)$.

Next, the shares of the three locations in the total number of varieties produced are defined as

$$\lambda_j = \frac{n_j}{\sum_i n_i}, \quad (11)$$

where $j \in \{host, remote, Foreign\}$. Incorporating (10) into (11), we rewrite the shares of the production varieties as $\lambda_j = Z_j / \sum_i Z_i$. Then, the price index in each region is given by

$$\begin{aligned} T_F &= K[\lambda_F + \lambda_h(w_h)^{1-\sigma} + \lambda_r(w_r\tau)^{1-\sigma}]^{\frac{1}{1-\sigma}}, \\ T_h &= K[\lambda_F t^{1-\sigma} + \lambda_h(w_h)^{1-\sigma} + \lambda_r(w_r\tau)^{1-\sigma}]^{\frac{1}{1-\sigma}}, \\ T_r &= K[\lambda_F (t\tau)^{1-\sigma} + \lambda_h(w_h\tau)^{1-\sigma} + \lambda_r(w_r)^{1-\sigma}]^{\frac{1}{1-\sigma}}, \end{aligned} \quad (12)$$

where $K = (\frac{\sigma}{\sigma-1}\beta)(n_F + n_h + n_r)^{\frac{1}{1-\sigma}}$.

For a producer, the goods produced in the remote city must have sufficiently low prices to be sold for as much in the host city as if the goods were produced in the host city. As implied in (7), we must have $\tau Q_{rh} = Q_{hh}$, which leads to $\tau P_{rh}^{-\sigma} = P_{hh}^{-\sigma}$. By incorporating (7) into (8), the relative wage between the two cities is pinned down by $w_r/w_h = \tau^{(1-\sigma/\sigma)}$. With (11) and (12), we obtain the net real wage

$$\omega_j \equiv (1 - \gamma L_j) w_j / T_j \quad (13)$$

which is determined by a region's nominal wage and price index.

III. FDI and Urban Concentration

The liberalization policies consist not only of policies of opening the door to trade, but also the policies of opening the door to FDI. However, the role of FDI in urban concentration has seldom been addressed in the literature. To gauge

the gap, in this section, we discuss how FDI reshapes the urban concentration. In this model, note that we have presumed that the developed country treats the developing country favorably with free trade, while the latter still imposes tariffs against imports from the former. The lower wage costs in the developing countries create further incentives for the firms in the developed country to carry out FDI. However, FDI is usually inhabited by either political barriers or poor infrastructure in the developed countries, among other factors. With (5), (7), and (8), the profit function of a representative firm in the developed country is then given by $\pi_F^F = \tilde{A}(1+t^{1-\sigma} + (t\tau)^{1-\sigma})/\sigma$, where $\tilde{A} = A^{-\sigma} [(\sigma/\sigma - 1)\beta]^{1-\sigma}$.

We presume that the wage costs of the developed country are substantially greater than that in the developing country, such that if the developing country opens up to FDI by removing some political barriers, the firms in the developed country then relocate production (which incurs variable production costs) to the developing country to take advantage of the lower production cost there while remaining the headquarter services (which incurs fixed sunk costs) in domestic. If relocating production to the host city, the profit function of the representative firm *f* is as $\pi_F^h = \tilde{A}w_h^{1-\sigma}(1+1+\tau^{1-\sigma})/\sigma$.

Instead, if relocating to the remote city, the profit function of the firm is as $\pi_F^r = \tilde{A}w_r^{1-\sigma}(\tau^{1-\sigma} + \tau^{1-\sigma} + 1)/\sigma$. It is easy to show from the above profit functions that, with $\tau > 1$, the FDI only flows to the host city after the liberalization since $\pi_F^h > \pi_F^r > \pi_F^F$.⁴ While more labor migrate to the host city, the liberalization makes the incumbent megacity even mega.

However, supposed that the developing country adopts some favorable policies, such as establishing SEZs or Free Economic Zones within remote city, aiming at attract FDI to the remote city. Within the zones, the developing country would improve its infrastructure by developing its logistics system, especially the connection to the exporting ports. Furthermore, the developing country might provide duty-free of the importation, exportation, and transit of

goods, among other favorable policies specific to the SEZs, or even special tax incentives to the firms within the zones. In all, let's presume that those favorable SEZ policies fully compensate the transportation cost, making the remote city be accessible to the international markets just as freely as the host city. In that circumstance, the profit function of the representative firm from the developed country produced in the remote city becomes $\tilde{\pi}_F^r = \tilde{A}w_r^{1-\sigma}(1 + \tau^{1-\sigma} + 1)/\sigma$.

With the inequalities $\tau, t > 1$ and $1 > w_h > w_r$, comparing π_F^h , $\tilde{\pi}_F^r$, if having the SEZ policies that favor the remote city, liberalization would attract FDI to the remote city since $\tilde{\pi}_F^r > \pi_F^h > \pi_F^F$.

IV. Urban Concentration and Welfare

As illustrated above, the firms in the developed countries find more profitable to relocate their production abroad by offshore production if relative political barriers are removed and some favorable policies are implemented. For simplicity, let's assume that it takes no real resources, but mostly political favors, for the developing country to implement the SEZ policies to target at some industries.⁵ Only a share of the developed country's firms, say s share, are belong to these targeted industries, thus relocate their production to the developing country. In the monopolistic competition model with a constant elasticity of substitution, as implied in (10), number of firms of a country is determined by exogenous parameters as its labor supply is inelastic. Hence, the favorable policies from the developing country would allow sn number of firms in the developed country relocating abroad.⁶ The remaining untargeted firms $(1-s)n$ remain production in the developed country.

Suppose further that the FDI incurs no additional organizational cost. This simplification makes the cost function of multinational firms that implement FDI

to be just the same as in (6). Due to the favorable SEZ policies, these multinational firms relocate their production to the remote city to not only serve local markets but also their home markets. The price index for the three locations in (12) can be rewritten as

$$\begin{aligned} T_F^* &= K[(1-s)\lambda_F + \lambda_h(w_h)^{1-\sigma} + (\lambda_r + s\lambda_F)(w_r)^{1-\sigma}]^{\frac{1}{1-\sigma}} \\ T_h^* &= K[(1-s)\lambda_F t^{1-\sigma} + \lambda_h(w_h)^{1-\sigma} + (\lambda_r + s\lambda_F)(w_r\tau)^{1-\sigma}]^{\frac{1}{1-\sigma}}, \\ T_r^* &= K[(1-s)\lambda_F t^{1-\sigma} + \lambda_h(w_h\tau)^{1-\sigma} + (\lambda_r + s\lambda_F)(w_r)^{1-\sigma}]^{\frac{1}{1-\sigma}}. \end{aligned} \quad (14)$$

Take differentiating of the price indexes in (14) with respect to s , we obtain

$$\begin{aligned} \partial T_F^* / \partial s &= \frac{1}{\sigma-1} \lambda_F K [\lambda_F + \lambda_h w_h^{1-\sigma} + \lambda_r w_r^{1-\sigma}]^{\frac{\sigma}{1-\sigma}} (1 - w_r^{1-\sigma}) < 0, \\ \partial T_h^* / \partial s &= \frac{1}{\sigma-1} \lambda_F K [\lambda_F t^{1-\sigma} + \lambda_h (w_h)^{1-\sigma} + \lambda_r (w_r\tau)^{1-\sigma}]^{\frac{\sigma}{1-\sigma}} (t^{1-\sigma} - (w_r\tau)^{1-\sigma}) < 0, \\ \partial T_r^* / \partial s &= \frac{1}{\sigma-1} \lambda_F K [\lambda_F t^{1-\sigma} + \lambda_h (w_h\tau)^{1-\sigma} + \lambda_r w_r^{1-\sigma}]^{\frac{\sigma}{1-\sigma}} (t^{1-\sigma} - w_r^{1-\sigma}) < 0. \end{aligned} \quad (15)$$

The above inequalities imply that all regions are better off with higher real wages when the developing countries employs the SEZ policies to promote its remote city. The increasing welfare provides the developing country incentives and resources to carry out the SEZ policies. However, to focus on our analysis, the mechanism of financing the SEZ policies is not defined in this paper.

Further, as in (2), (3) and (10), the number of varieties produced in city j is proportional to the city's net labor inputs. However, commuting costs increase with urban concentration, such that a lower urban concentration frees some labor hours out of the commuting. Thus, a declining urban concentration gives a rise to net labor supply of the economy, which in turns leading to more supply of number of varieties in aggregate.⁷ As a result, with increasing real

wages and number of varieties as well, all regions are better off with the liberalization even when the developing country only favors the remote city but not the host city.

With equations (14) and (15), we obtain the comparison in real wages as

$$\frac{\omega_h}{\omega_r} = \left(\frac{1 - \gamma L_h}{1 - \gamma L_r} \right) \left(\frac{T_r^*}{T_h^*} \right). \quad (16)$$

Equation (16) implies that real wage in the remote city increases more than that in the host city since that T_r^* increases more than T_h^* with the inflow FDI.⁸ We argue that when more production activities take place in the remote city through FDI, the real wage in the remote city rises more than that in the host city and thus the demand for workers increases in the former. Therefore, workers would move from the host city to the remote city as L_h reduces but L_r increases until the real wages are equalized again between the two regions, leading to a lower urban concentration rate.

This model sheds some light on why and how to dissolve urban concentration, by suggesting that a developing country should not only open its door to trade, but also to FDI. Most important, before carrying out these liberalization policies, the government better allocates more resources to improve infrastructure of its “remote” regions to make them be more freely accessible to international markets. This argument echoes with the empirical findings by Rauch (1989), who shows that trade liberalization causes border and coastal cities to grow, and city size declines monotonically from the coastal areas to the interior of the county and by also the findings by Henderson (1996), who points out that the impact of trade on urban concentration depends on the country-specific geographical features between the coastal and remote cities. Note that the coastal cities are in general more easily accessible to international markets than the interior cities.

V. Urbanization Rate and Urban Concentration in China

In China, the eastern coastal cities are prosperous and crowded, while the inland provinces are poorer and sparsely populated. Given the severe lack of capital and technologies, China adopted “The Open Door” policy to first open up her coastal regions, and then later the interior regions to foreign investment in 1978. By specifically aiming at attracting capital from the overseas Chinese, China established SEZs in Shenzhen, Zhuhai and Shantou in Guangdong Province and Xiamen in Fujian province, as well as the entire Hainan province, as shown in Figure 1. The success of the SEZs has been outstanding. During the 1980s-1990s, about two-thirds of FDI in China was received from non-resident Chinese (NRC). These NRC investments were brought to China with their overseas markets and their capital, skills, technologies, and modern management techniques, thereby allowing China to successfully carry out its structure transformation from an agriculture to an industrialized economy (Zhang, 2005; Lo and Liu, 2009).

With the success of the SEZs, China further established 154 more new zones as also shown in Figure 1, known as Economic and Technological Development Zones (ETDZs), placed an emphasis on developing high-tech research and development.⁹ There are many other zones with similar functions aiming to attracting FDI that have been established nationwide, such as free trade zones, export processing zones, industrial parks, high-tech industrial development zones, and others. Added together, the total employment of these economic zones accounted for more than ten percent of China’s total urban employment (Zeng, 2011). “A little leaven leavens the whole lump.” (Galatians 5:9). Although the ratio of inflows of FDI to China’s domestic investment has been less than ten percent, inflows of FDI located in the SEZs play a key role as

the leaven that leavens the economic activities in China. The FDI brings advanced skills, technologies, and modern management techniques to China. The consequent knowledge spillovers encourage local firms to become either qualified subcontractors in the supply chain or direct competitors that almost follow the same path, thereby forming specific industrial clusters in the surrounding area of the SEZs.



Source: Zeng (2011) Map 1.1, p 11.

Figure 1. Economic and Technological Development Zones, 2010

Therefore, many specific industrial clusters, largely supported and nurtured by the local governments, have emerged and exist in parallel with those economic zones. These clusters are mainly engaged in manufacturing the

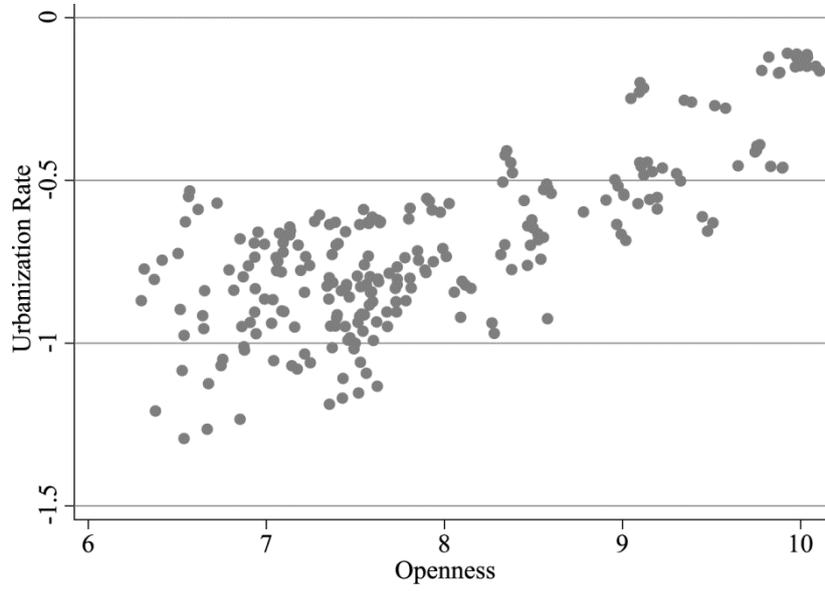
labor-intensive products, thereby accommodating a huge number of rural migrant workers. Since most of the industrial clusters are in labor-intensive sectors, Zeng (2011) estimates that the total employment in the industrial clusters in China should be much higher than in the SEZs. To sum up, the employment in both the industrial clusters and economic zones might account for more than twenty percent of China's total urban employment. That is, they greatly help in reducing the urban concentration in China.

However, these economic zones and clusters are located at a distance from their host cities, just like an "isolated island" with few social services and little public transportation (Zeng, 2011). For example, Shenzhen, which was among the first four locations in China to be given SEZ status, is located 100 kilometers southeast of the provincial capital Guangzhou. From being a small village with a population of 30,000 in 1980, Shenzhen has become one of the largest cities in China with a population of more than ten million in 2014. Considering that if Chinese government had granted the SEZ status to the provincial capital Guangzhou, it would have only made Guangzhou an enormously large megacity. Instead, the Chinese government established these economic zones and industrial clusters on the fringes of large cities, helping relocate hundreds of millions of rural workers from agricultural to industrial sectors on one hand and avoiding the emergence of megacities and slums on the other.

It has been widely acknowledged that the Chinese government has played a very important role in the success of the Chinese economic zones and clusters by building a better infrastructure, especially the transportation infrastructure connecting these remote locations to the world market. For example, starting from a small village in 1978, given large policy supports from Chinese government, port of Shenzhen has become one of the busiest and fastest growing container port in 2015 in the world, only next to Shanghai and Singapore and even exceeds Hong Kong.

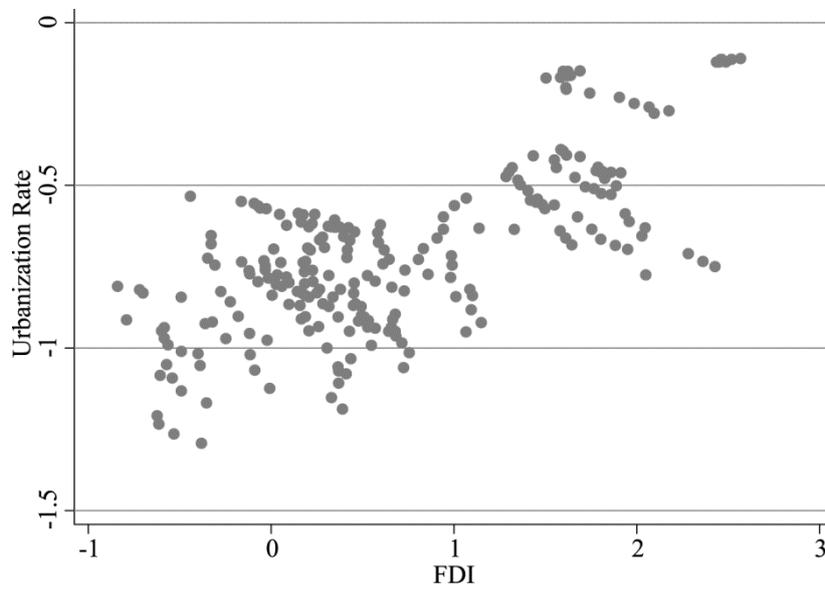
Let's take the Shenzhen and Guangzhou as an example again, the SEZ makes Shenzhen a "manufacturing city" and Guangzhou the "commercial city", while the residents in the former can easily access the social and leisure activities (e.g., better universities, hospitals, and stadium) in the latter and the residents in the latter can obtain manufacturing products from the former at lower cost. In general, workers in both the manufacturing and service sectors constitute the urban population. This model suggests that the economic zones that aim at attracting FDI help disperse the urban concentration by separating a megacity into two differently functioning cities: a "commercial city" and a "manufacturing city". On the other hand, more city residents imply higher urbanization rate for the country as a whole. We examine these two arguments in the following.

First, our model suggests that the open policy of China since 1989 should have accelerated urbanization rate in the provinces of China that are more open to foreign direct investment (FDI). Here, we use real data to examine this argument. There are about 30 administrative divisions (e.g., provinces) in China.¹⁰ We thus use Chinese province-level data to examine whether urbanization rate increases with FDI. We collect these province-level data from the National Bureau of Statistics of China for year 2006-2013. We define a division's urbanization rate as the share of its urban population in its total population and define the FDI as the share of utilized FDI in a division relative to its GDP. Note that China has provided many favorable policies (e.g., duty-free of the importation and exportation) specific to the special economic zones (both SEZs and ETDZs), such that foreign enterprises would reside in these economic zones if relocating to China. Therefore, those divisions that have established more special economic zones should have attracted more FDI, hereby leading to more urban concentration in this division. As illustrate in Figure 2, these regional urbanization rates do logarithmically increase with the FDI in China.



Data Source: The National Bureau of Statistics of China (2006-2013).

Figure 2. Urbanization and Openness¹¹



Data Source: The National Bureau of Statistics of China (2006-2013).

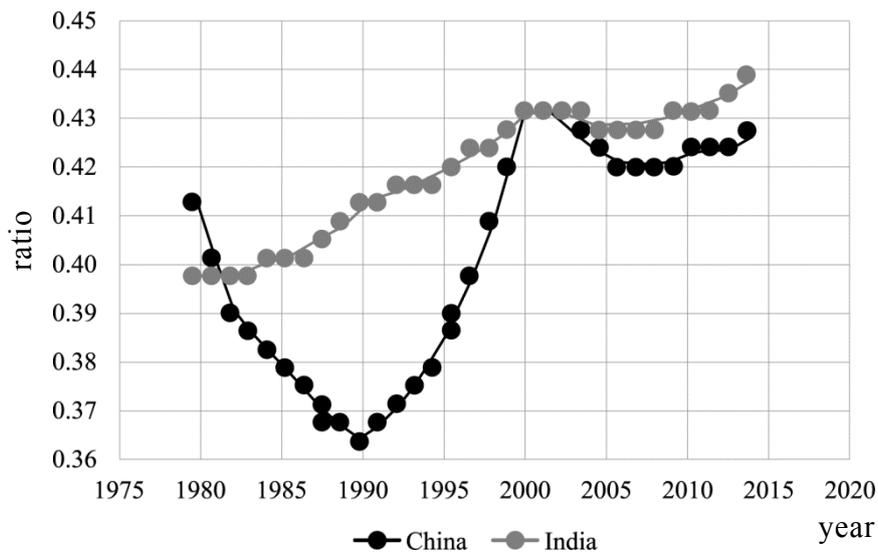
Figure 3. Urbanization and FDI¹²

Furthermore, those special economic zones (both SEZs and ETDZs) are export-oriented, wherein the foreign enterprises are encouraged to target at international markets rather than Chinese domestic consumption. As mentioned above, China's local government have nurtured local firms to emerge as specific industrial clusters in parallel with those economic zones. These industrial clusters thus are engaged in international trade (e.g., purchasing high-tech equipment and components from abroad) by the way of doing business with the economic zones (e.g., providing specific components). As a result, those divisions that have established more special economic zones should be engaged in more international trade. As illustrated in Figure 3, it shows that the regional urbanization rates logarithmically increase with the openness in this division. Here, we define openness as the share of a division's imports plus exports relative to its GDP.

VI. The Case of China vs. India

China and India are the only two countries in the world with population more than one billion. India was even the first country in Asia to set up Export Processing Zones (EPZs) to promote exports in 1965. However, the EPZs have had minimal success in India, largely due to some shortcomings such as the absence of good infrastructure. Urged by the great success of China's SEZs, India announced her SEZ policy in 2000, promising tax breaks, good infrastructure and more enticements, to lure more and larger foreign investors to export-oriented industries in India. However, India's SEZs are still much smaller than China's, making the former unable to effectively absorb the redundant rural workers. For example, the entire 571 approved SEZs in India cover a total area of 67,680 hectares, while the Shenzhen SEZ alone (the first SEZ in China) covers 32,634 hectares.¹³

As shown in Figure 4, the urban concentration in China has generally smaller than India's since the 1980s, at the time when China began establishing its SEZ policy. Please note that China's urban concentration was larger than India in early 1980 when China had just opened her doors to FDI. Here, we define the urban concentration as the population in urban agglomerations of more than one million in total urban population (e.g., Yan and Zhang, 2015). By comparing the two countries with the largest population, the milder urban concentration in China could be generally explained by China's compulsory *hukou* system that divides urban and rural residents, her better infrastructure, and her greater degree of openness.



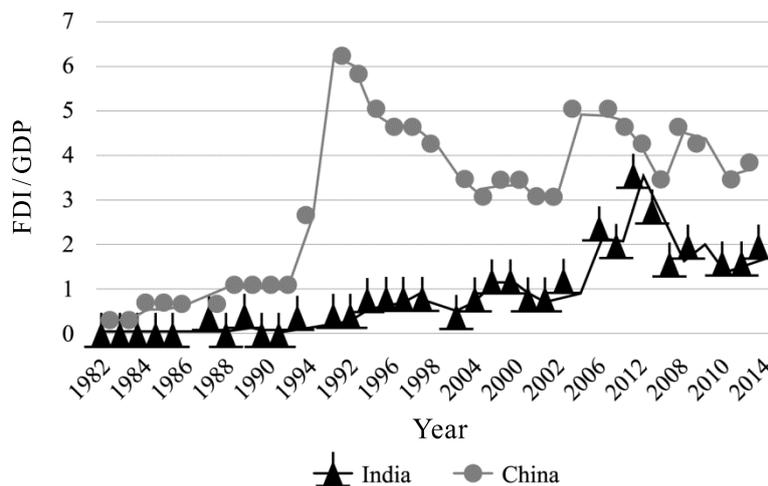
Data Source: World Bank (1980-2014).

Figure 4. Urban Concentration: China vs. India

However, during the late 1990s, China's national and local authorities substantially relaxed restrictions in the *hukou* system on obtaining urban residence permits, in order to obtain sufficient manpower by encouraging rural migrants to move to cities. Those hukou reforms help reduce some discrimination against

migrant workers, hereby enhancing their upward mobility toward cities (Wang, 2005). As a result, the urban concentration in China rise substantially during the late 1990s. Still, as shown in the Figure 4, while China's urbanization rate substantially outnumbers India, the former's urban concentration is considerably lower than the latter during the periods before and after year 2000. We contribute it to the successful specialize economic zone policies of China.

To the contrary, there is no such hukou restriction in India. In consequence, to acquire a better life in the cities, India's redundant rural farmers rush to cities and then form slums. As a result, India's slum population surges to almost one billion, or around 9% of her total population (Dash, 2013). That is, the slums in India helps explain why her urban concentration is substantially larger than China. To provide more evidence that China's success in attracting FDI by its SEZs and industrial clusters play a role on her milder urban concentration. We illustrate the ratio of inflows FDI to GDP of the two countries in Figure 5, which shows that China's FDI/GDP is substantially larger than that in India, not to mention the level of FDI.



Data Source: World Bank (1980-2014).

Figure 5. FDI in China and India

VII. Conclusions

While megacities generate high congestion, the consequently high commuting cost is a waste of labor resources. This paper suggests that, before opening doors to both trade and FDI, a developing country better carries out some favorable policies to improve its “remote” regions’ infrastructure (e.g., the SEZ policies) in order to make them be more freely accessible to international markets. By this way, a country’s urban concentration reduces with its liberalization to FDI, and then a lower urban concentration frees some labor hours out of the commuting. The increase in net labor supply in turns improves welfare of the country with the higher real wages and more varieties of consumption.

In real practice, in order to successively attract FDI, many developing countries have established special economic zones or industrial clusters on the fringes of “commercial cities”, and made good (transportation) infrastructure to connect them to global markets. The SEZ and industrial clusters constitute the “manufacturing city”, attracting more FDI due to their lower wage costs than that in the “commercial city”. As a result, some rural workers are therefore attracted to the “manufacturing city” and some migrating to the “commercial city”.

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Endnotes

1. Also see Monfort and van Ypersele (2003) and Paluzie (2001).
2. Also see Krugman (1996) and Behrens *et al.* (2007).
3. We obtain this by integrating (2) from 0 to d_j .
4. With (13), we have $(1 + 1 + \tau^{1-\sigma}) > \tau^{(1-\sigma)^2/\sigma} (\tau^{1-\sigma} + \tau^{1-\sigma} + 1)$ since $\tau > 1$, which ensures $\pi_F^h > \pi_F^r$.
5. Alternatively, we can pursue that the government can levy a lump-sum tax on everyone, and use the collected taxes to invest in the infrastructure investment that is only favorable to the remote city. We will show later that the SEZ policies are welfare improving for a country as a whole, such that the increasing welfare could compensate the cost of the SEZ policies.
6. Some labor in the developed countries become share owners of the multinational firms when these firms relocate their production abroad (which incurs variable costs) but remain the headquarter services (which incur fixed sun costs) at home. On net, full employment holds in the developed country.
7. In this model, we presume that there are two cities in the developing country, say city 1 and city 2. Suppose further that the inelastic supply of the country is L , and $L = L_1 + L_2$. In (3), the supply of net labor input in each city is given by $Z_1 = L_1 - (\gamma/2)L_1^2$ and $Z_2 = L_2 - (\gamma/2)L_2^2$, respectively. In order to maximize the net labor supply inputs, we take the first order condition of $Z_1 + Z_2$ and obtain $-\gamma(2L_1 - L) = 0$ and its second order condition is $-2\gamma < 0$. These implies that the net labor supply inputs of a country as a whole is maximized when its urban concentration is reduced till $L_1 = L_2$.
8. In (15), it is easy to find out that $|\partial T_r^* / \partial s| > |\partial T_h^* / \partial s|$.
9. Zeng (2011) has drawn a map of the locations of these Economic and Technological Development Zones in China. I have borrowed his map to highlight that many of these special production zones are located not only in the coastal regions but also in the interior.
10. We drop Tibet in the sample, since it presents as an outlier in many aspects.
11. Also see Figure 3 in Lo (2016).
12. Also see Figure 4 in Lo (2016).
13. See Rawat, Bhushan, and Surepally (2011).

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城鎮集中化與外資：中國和印度的比較

羅竹平*

我們建立一簡單的模擬，以說明開發中國家的農村城鎮化時的大城市病會隨著開放外國投資而減少，只要這些外國投資是被導引到相對「偏遠」地區。否則，大城市病會隨著開放外國投資而更嚴重。為了避免大城市病裏常有的高污染和擁塞，本文建議，一個開發中國家在貿易自由化之際，政府應先投資良好的交通基礎建設將外資吸引到其「偏遠」地區。如此，外資投資可幫助減少其大城市病；否則，外資反而會益增其大城市病。因此，本文建議，為了成功吸引外資到其「偏遠」地區，開發中國家可在當地建立經濟特區或工業園區，同時也提供優惠政策並在此投資基礎建設使之更好的連結國際市場。這些經濟特區會因外資進駐而帶來工作機會，幫助分流商業大都會的人口，因而流入減少大城市病。另外，本文也認為，當大城市病減少時，其因而減少的通勤擁塞會釋放人力資源，從而增加該國更多的生產和福利。

關鍵詞：經濟特區、城鎮集中化、中國、印度

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