

# Beyond Lewis: Rural-to-Urban Migration with Endogenous Policy Change \*

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## Abstract

*Three important problems of urbanization in China are analyzed under a unified framework in this paper: within-city inequality, under-urbanization, and urban economic growth. Our model emphasizes the costs of potential conflicts caused by the de facto income disparity between the urban natives and the rural-to-urban migrants, which is the result of providing urban public services to natives exclusively. We show that, in the early stage of urban economic growth when the losses of potential conflicts are relatively small, the exclusive provision of urban public services may be beneficial to native urban residents. However, the losses under such unequal public service provision policy increase in the process of urban growth, and beyond a certain stage of development, opening public service access equally to the migrants will be a better choice, even if only the natives' utility is considered. Such an endogenous policy change not only decreases within-city inequality and conflict, but also advances urbanization and urban economic growth.*

**Keywords:** Urbanization, Social Conflicts, Rural-Urban Segment, Endogenous Policy Change

**JEL Classifications:** O43, O18

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# 1 Introduction

While urbanization is considered an important part of development (Lewis, 1954), there are still several problems with China's urbanization process. One problem is under-urbanization. While 89.7% of China's GDP was derived from secondary and tertiary industries in 2009, urban residents constituted only 46.6% of the total population<sup>1</sup>. A related but different problem is low economic growth in China's cities. If there exists an optimal level of urbanization for urban growth (Henderson, 2003), China's urbanization is well below this level and the urban growth rate is also inadequate. The third problem is inequality and conflicts within cities, especially between groups with different identities. In Chinese cities, the disparities in wages and returns on education between urban natives (those who have the urban *hukou*) and rural-to-urban migrants (having no urban *hukou*) are large and rising (Meng and Bai, 2007; Zhang and Meng, 2007), and the urban public services are mainly opened to natives with local *hukou* exclusively. Most existing research looks for solutions to one of these three problems in urbanization, while relatively little attention has been paid to the connections between them. In this paper, we will analyze these problems facing China's urbanization in a unified framework.

Our model emphasizes the costs of potential conflicts caused by the *de facto* income disparities between urban natives and rural-to-urban migrants, which result from the provision of urban public services to native urban residents exclusively. We show that, in the early stage of urban economic growth when the losses of potential conflicts are relatively small, exclusive urban public service provision may be beneficial in terms of welfare of native urban residents, but the losses under such unequal public service provision policy increase in the process of urban growth. Beyond a certain stage of development, opening public service access equally to the migrants will be a better choice, even if only the natives' utility is considered. Such an endogenous policy change not only decreases the with-in city inequality and conflicts, but also advances urbanization and urban economic growth.

There is no direct migration restriction or wage discrimination against migrants in the urban market in our model, which does not mean they have no impacts on China's urbanization process. The important role that migration restrictions have played in China's inadequate urbanization and urban growth have been widely discussed (Au and Henderson, 2006a,b; Poncet, 2006), as the impacts of this discrimination on Chinese urban society (Meng and Zhang, 2001). In contrast, although the inequality of access to urban public services between two groups with different identities has been noticed in different disciplines, its impact on China's urbanization and urban economic growth has not been analyzed formally. To focus our attention on differences in public service access, migration restriction and wage discrimination are abstracted in our model.

Although the model is based on the background of China's urbanization, our analysis is not limited to China alone. Social segmentation and horizontal inequality between different social groups

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<sup>1</sup>Data source: National Bureau of Statistics of China, *China Statistical Yearbook 2010*.

are common in developing countries (Stewart, 2002). The property rights and access to public services of rural-to-urban migrants are not as well protected as those of urban natives' (de Soto, 2000, 2002), and the urban bias of economic policies is also common (Lipton, 1977). While social segmentation in Chinese cities is connected with the *hukou* system, segmentation between different races and castes are more common in other countries. The anti-immigration trends in Europe and other welfare states is another example of social segmentation. With the urban population consisting of more than a half of the global population, more unified theories of urban social segmentation, urbanization, and urban economic growth should be developed, as this paper aims to do. We try to show in this paper, as long as such kind of social segmentation and horizontal inequality between different social groups will induce huge negative effects for the privileged group, there is high possibility that policy change might endogenous happen.

The paper is organized as follows. The next section reviews the main related literature and China's institutional background. Section 3 will present the basic settings of our model. It will be demonstrated that the exclusiveness in urban public service provision itself plays an important role in with-in city inequality, under-urbanization, and urban under-development. Section 4 will discuss the endogenous policy transition from native-biased to migrant-inclusive urban public service provision. Section 5 concludes.

## 2 Institutional Background and Literature

Lucas (2004) emphasized that a successful urbanization theory should have three distinct features: describing the coexistence of the traditional and modern economic sectors over a long period, characterizing the migration out of the agriculture sector into modern sectors, and explaining income equalization among migrants. In classical urbanization theory, the coexistence of different sectors and migration flow from traditional to modern economic sector are both modeled, but the with-in development of urban areas is simplified to a capital accumulation process without micro-structures (Lewis, 1954; Ranis and Fei, 1961). Subsequent studies focused on the with-in city process of urbanization. For example, unemployment in urban labor markets during urbanization is analyzed in Todaro (1969) and Harris and Todaro (1970), and their explanation for rural-to-urban migration is the higher wage expectation of migrants in urban sectors, even though they also face potential unemployment. Lucas' (2004) model focuses on the human capital accumulation of migrants in urban sectors, and the rising income disparity between the traditional and modern sectors during the urbanization process. The social dimension of urbanization, especially social segmentation, has received much less attention, but should be the fourth feature of a unified urbanization theory.

Some literature has discussed the inadequate level of urbanization in developing countries, mainly focusing on policy and institutional factors. In former central-planned economies such as

China, policy restrictions on migration between rural and urban areas are considered an important cause to under-urbanization and under-development of urban economies. [Au and Henderson \(2006a,b\)](#) found that China's migration restriction not only slowed down its urbanization, but also depressed its economic agglomeration, resulting in large income losses. However, even in China, direct migration restrictions declined in recent years ([Poncet, 2006](#)).

Although inter-regional migration restrictions have been loosened in recent years, the public services in Chinese cities are still biased towards native local residents. For example, high-quality elementary education is usually open to urban residents with the local *hukou* only, so that migrant children only have access to inferior basic education. Similarly, social insurance programs provided by urban governments, mainly health insurance and pension, basically only cover local urban residents. Even if some urban areas do provide special social insurance for the migrants, the benefits are lower than those of urban natives. The difference between implementation and intention of policies or laws will also result in difference of benefits from public service or social insurance programs between migrants and urban natives. For instance, practically local public kindergarten has various ways to refuse enrolling migrants' children, even if local policies indicate that there should not exist barriers for migrants. As far as social protection program is concerned, in practice migrants can not benefit from some of the social protection funds paid by firms if they leave the city. And usually those funds will flow into the pool for urban natives. That is to say, in some cases, the interests of the migrants are even sacrificed to protect those of urban residents. There are also other public benefits provided by the government that mainly serve the urban natives, one of which is the public housing or low price housing. Besides, rural residents have long had a lack of voice in the formulation of policies, which puts them at a disadvantage in accessing urban public services equally. Exploring the effects of these inequalities in public service sharing on urbanization and urban economic growth is the main agenda of this paper.

Our question is whether urbanization would proceed harmoniously if all the discriminations in the urban labor market were to be removed. Our answer is no, as long as the access to urban public services remains unequal between different groups within cities.

Our model also proves that the policy change from unequal to equal urban public service provision may well be an endogenous process. Although endogenous institutional transitions have been discussed in many recent economic theories (e.g., [Acemoglu and Robinson, 2000](#)), we are unaware of any work that has used income disparity between different groups as the driving force of such endogenous transitions. In this paper, the key assumption is that, the *de facto* income disparity between the urban natives and the rural-to-urban migrants will trigger the loss of urban social output. [Benhabib and Rustichini \(1996\)](#) tell the similar story in their study. We emphasize the income disparity within the urban areas between the local residents and the rural migrants, because compared with individual income disparity in general, the horizontal inequalities between these two kinds of social groups have more significant effects on the harmony and stability of the urban so-

ciety (Stewart, 2000, 2002). Such kind of loss includes not only the actual loss, for instance the loss from crimes (Blau and Blau, 1982; Kelly, 2000; Fajnzylber, Lederman, and Loayza, 2002)<sup>2</sup>, but also the expenses related to preventing the occurrence of these losses, such as the resources used in the formulation of laws and for crime prevention. In the mid-1990's, the income disparity between the urban and rural areas was at a staged bottom and there was a comparatively small number of property violability cases. After that, the income disparity between the urban and rural areas and the occurrence of property violability cases rose simultaneously in the shape of "W" with the changes of the latter lagged a little. Between 1988 to 2004, the financial expenditure for the public security in all the provinces of China, the total amount of all the counties (including prefectures), cities and province, accounted for nearly 7‰ from less than 4‰ in the provincial GDP<sup>3</sup>. The indirect effects arising from differences in household registration status will have other consequences. For example, Knight and Gunatilaka (2008) found that the life satisfaction degree of migrants in urban areas was not only lower than their counterparts-the urban residents, but also lower than rural residents. Jiang, Lu, and Sato (2010) found that compared with urban residents, rural migrants without urban *hukou* would become more dissatisfied with the widening income disparity arising from identity difference and would not become more satisfied with increased income within the immigrant group. No matter the manifest conflict between these two kinds of labor force or the potential loss of the urban output, the "voting by fists" mechanism within urban areas no doubt have huge negative effects on the transition and development of the urban society<sup>4</sup>.

Another feature of our model is the integration of institutional transition and economic growth. This kind of integration can also be seen in Acemoglu, Aghion, and Zilibotti (2006), in which two growth mechanisms, imitation and innovation, need different optimal institutions (including the firm organizations, contract enforcement, and credit system) to achieve different growth frontiers. This implies that growth based on imitation cannot be sustained beyond a certain development stage, which induces endogenous institutional change. Galor and Moav (2004, 2006) also model endogenous policy change of public education in European history, emphasizing the disparity between physical and human capital returns during economic development. In the early phases of economic growth, income differences promote accumulation of physical capital by the rich. How-

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<sup>2</sup>In reality, there are cities with both high crime rate and high economic growth as well as ones with both low crime rate and low investment and economic growth. But there are complex factors impacting the urban economic growth. The purpose of this paper is to analyze one of the mechanisms working on it. Also, we think that in the process of urbanization and social transition in the present China, this mechanism has played an important role in the harmonious urban development.

<sup>3</sup>If the financial expenditure for public security of counties, cities and provinces accounts for 7‰ of the GDP and we use the GDP data in 2008, it equals to about RMB166 for each person with China's 1.3 billion population.

<sup>4</sup>We name the mechanism of political changes caused by social conflicts "voting by fists". Economists usually only study "voting by hands" and "voting by feet" and pays little attention to the mechanism "voting by fists" of the underprivileged class. Generally speaking, "voting by fists" here represents such mechanism which has huge negative effects helping the underprivileged group fight for their right.

ever, the return to human capital will become larger and larger with economic growth, overtaking the return to physical capital beyond a certain stage of development. Thus policy makers will ultimately have incentives to provide more inclusive public education to accelerate the accumulation of human capital, a finding that resonates with our findings below.

### 3 The Basic Model

#### 3.1 Assumptions and Equilibrium

Consider a dual-economy with a constant total labor force, and the number of urban natives is also constant and normalized to 1. Suppose that at period  $t = 0$ , there are no rural-to-urban migrants and the rural population is  $N$  (thus the total labor force in the economy is constant at  $1 + N$ ). There are no direct policy restrictions on migration, and the labor force in the whole economy is assumed to be homogeneous. Thus rural residents can migrate to cities freely and compete with urban natives in the urban labor market. The only difference between urban and rural labor is that the later cannot obtain urban *hukou*, without which one cannot benefit from urban public services such as children's education and social security.

The product function of the urban sector takes the following Cobb-Douglas form:

$$Y_t = (1 + m_t)^\alpha K_t^{1-\alpha}, \quad 0 < \alpha < 1, \quad (1)$$

in which  $K_t$  and  $m_t$  are the stock of urban physical capital and the number of rural-to-urban migrants at period  $t$  respectively. It will be shown later that the *de facto* income level in the urban sector is always higher than that in the rural sector (until the process of migration finishes), hence generally  $0 \leq m_t \leq N$ . Similarly, assuming that the rural sector uses labor and land as inputs and that the quantity of land is also a constant, normalized to 1, the production function of the rural sector is

$$Y_t^R = (N - m_t)^\beta, \quad 0 < \beta < 1. \quad (2)$$

Each rural resident receive income as a portion of total rural output<sup>5</sup>:

$$c_t^R = \frac{Y_t^R}{N - m_t} = (N - m_t)^{\beta-1}. \quad (3)$$

As mentioned above, although discrimination in urban labor market is also important, it is not our focus here. In this model, a perfectly competitive urban labor market is assumed and migrants from rural area can receive the same wage as native residents, which is determined by the marginal labor product,

$$w_t = \alpha (1 + m_t)^{\alpha-1} K_t^{1-\alpha}. \quad (4)$$

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<sup>5</sup>Both income and consumption are denoted by  $c$  in this paper, as the individual saving decision is not considered in our model.

Whether a rural resident chooses to migrate and work in an urban area or stay in the rural sector depends on where her real income is higher. As rural residents can migrate to urban areas freely, in equilibrium, the real incomes are equal in both places,

$$c_t^M = c_t^R. \quad (5)$$

The difference between the *de facto* incomes of urban natives and migrants plays an important role in our model, and we will introduce this difference in detail later. At this point, we just assume that the income of a rural-to-urban immigrant consists of her wage only,

$$c_t^M = w_t. \quad (6)$$

From equations (3)-(6), we have

$$c_t^M = \alpha (1 + m_t)^{\alpha-1} K_t^{1-\alpha} = (N - m_t)^{\beta-1}, \quad (7)$$

or equivalently,

$$\frac{(1 + m_t)^{\alpha-1}}{(N - m_t)^{\beta-1}} = \alpha K_t^{1-\alpha}. \quad (8)$$

Thus, in equilibrium,  $\partial m_t / \partial K_t > 0$ , which can be summarized as the following proposition:

**Proposition 1** *If there is no restriction on migration, the equilibrium number of rural-to-urban immigrants  $m_t$  will increase with the urban capital stock  $K_t$ .*

Despite the perfectly competitive urban labor market, discriminatory policies regarding public service based on hukou still makes it difficult for migrants to obtain the benefits of urban public service in China. A question that follows is “if these discriminatory policies in the labor market were eliminated, but the discrimination in the sharing of urban public service based on hukou still exists, what effects would this have on the economic growth and internal social harmony of urban areas?” To answer this question, we need the assumption that while a migrant without urban *hukou* could only obtain her wage in the urban sector, an urban native’s income includes her wage plus additional benefits from urban public service. Or equivalently, there is a *de facto* income gap between urban residents and migrants. The widening of income disparities will give rise to social and political instability, worsen the investment environment and decrease capital accumulation because more resources are used to protect property rights, as discussed in Section 2.

In this paper, we introduce the following function to describe the loss of urban output arising from *de facto* income inequality:

$$\Delta_t = \theta (\eta_t m_t)^\varphi, \quad (9)$$

where  $\eta_t$  reflects the degree of income inequality between the two kinds of labor force within urban area. The larger  $\eta_t$ , the larger the inequality. We normalize this to the function as follows:

$$\eta_t = 1 - \frac{c_t^M}{c_t} \geq 0, \quad (10)$$

where  $c_t$  is the *per capita* real income of urban residents (including the wage and benefits from public service).

In the bracket of the equation (9) is the product of the degree of income inequality between native urban and migrant labor and the number of rural-to-urban migrants, which we use to measure the social disharmony within urban areas, denoted as  $G_t$ . That is

$$G_t = \eta_t m_t = \left[ 1 - \frac{(N - m_t)^{\beta-1}}{m_t} \right] m_t. \quad (11)$$

The effects of related factors that we will discuss later on urban social harmony will all be based on the effects of this variable. Obviously, the greater the *de facto* income disparity between urban natives and immigrants, the bigger the value of  $\eta_t$  (closer to 1) and the value of  $G_t$  are, which implies the lower degree of the urban social harmony.

The parameter  $\theta > 0$  measures the sensitivity to the above mentioned *de facto* income disparity between native urban residents and immigrants. If the value of the parameter  $\theta$  becomes larger, we can interpret it as follows: if the income disparity between the two groups within the urban areas persists (even does not keep getting widened), with access to richer information and growing subject consciousness in urban society, rural migrants will become more dissatisfied with the situation, which will lead to a greater loss of urban sector output from non-productive investment in the control of the potential urban social conflicts. The parameter  $\varphi \geq 1$  reflects that the effect of inequality within urban areas on society is not the simple sum of that on individual immigrants, but is amplified, because of urban agglomeration effects and dense social networking, coupled with the population concentration and the rapid and convenient information communication, all of which make it more likely that conflict will occur within larger urban societies.

From the perspective of expenditure, the aggregate output of the urban sector is comprised of consumption, investment and loss from the potential social conflicts:

$$Y_t = C_t + C_t^M + I_t + \Delta_t, \quad (12)$$

where  $C_t = c_t$  is the total income of urban residents with local *hukou*, the quantity of whom is 1;  $C_t^M = c_t^M m_t$  is the total income of the rural-to-urban immigrants<sup>6</sup>. For simplicity, we assume the ratio of urban investment to aggregate output in each period is a constant  $s$ ,

$$I_t = sY_t, \quad (13)$$

where  $0 < s < 1 - \alpha$ , i.e. in each period the urban area will accumulate capital by a certain percentage. Based on the equation (2) and equations (7)-(13), we have:

$$c_t = (1 - s) (1 + m_t)^\alpha K_t^{1-\alpha} - (N - m_t)^{\beta-1} m_t - \theta G_t^\varphi, \quad (14)$$

<sup>6</sup>In other words, after the investment and the loss from social conflicts are deducted, the capital income of the urban sector is the public service income obtained by the urban residents with urban *hukou*.



and from the function form of  $G$  in equation (11), we have the following equation:

$$c_t = \frac{(N - m_t)^{\beta-1}}{1 - \frac{G_t}{m_t}}.$$

In this way, equation (14) can be rewritten as:

$$\left(1 - \frac{G_t}{m_t}\right)^{-1} = (1 - s)(1 + m_t)^\alpha (N - m_t)^{1-\beta} K_t^{1-\alpha} - m_t - \theta (N - m_t)^{1-\beta} G_t^\varphi. \quad (15)$$

For any urban capital stock  $K_t$ , equation (8) determines the number of rural-to-urban migrants, and equation (15) determines the social disharmony degree  $G_t$  within the urban area. As shown in Figure 1, the curves AA and BB represent the right side and the left side of the equation (15), which are increasing and decreasing functions of  $G_t$  respectively. The intersection point of the two curves determines the value of  $G_t$  in equilibrium. AA illustrates that, with other parameters held constant, the degree of income disparity determines the level of social disharmony, while BB illustrates the effect of social disharmony on income disparity. By substituting equation (8) into the right side of equation (15), we find that as long as the urban capital gain is not all used for investment, (i.e.  $s < 1 - \alpha$ ), regardless of the value of the urban capital stock  $K_t$ . the intercept of BB on the y-axis is larger than 1 and as a result, AA and BB are bound to intersect, hence  $G_t > 0$ . Thus we obtain the second proposition:

**Proposition 2** *Even though there is no wage discrimination in the urban labor market, as long as the urban government does not provide public services equally to urban natives and immigrants, social disharmony within the city will surely exist.*

### 3.2 Comparative Statics

Proposition 2 implies that social disharmony arising from unequal access to urban public services will not disappear with the development of the urban economy. But will the severity of the disharmony gradually mitigate with urban economic development, at least to a degree that can be overlooked? If so, then the equal supply of urban public services may not be an important policy during the process of the urban development. Therefore, we next explore the effect of changes in the urban capital stock  $K_t$  on the social disharmony  $G_t$ .

By substituting equation (8) into (15), we have the following equation:

$$\left(1 - \frac{G_t}{m_t}\right)^{-1} = \frac{1-s}{\alpha} + \frac{1-\alpha-s}{\alpha} m_t - \theta (N - m_t)^{1-\beta} G_t^\varphi. \quad (16)$$

Proposition 1 tells us that the number of immigrants in equilibrium will increase along with the growth of the urban capital stock. From equation (11) we know that, an increase of the number of migrants will make the urban society more disharmonious. Therefore, as shown in Figure 2, curve

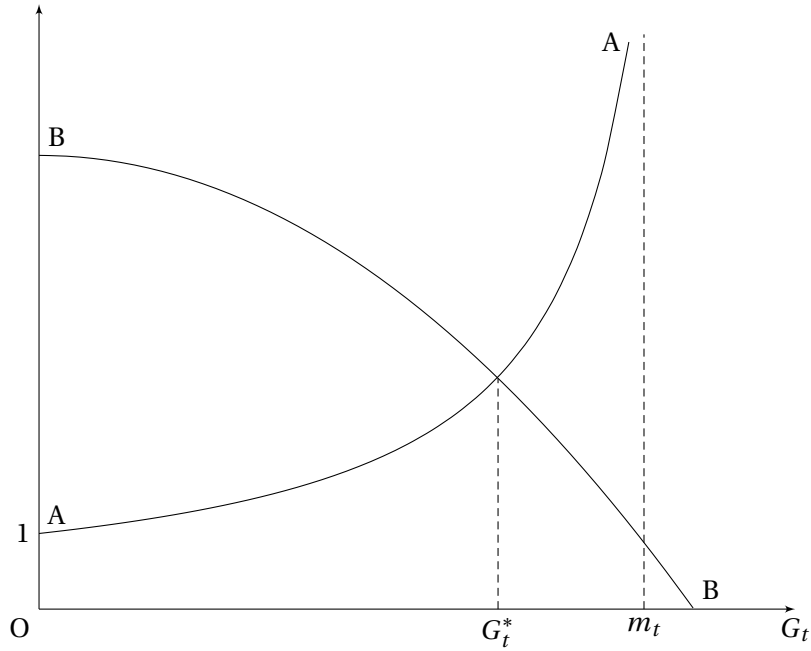


Figure 1: The determinant of the urban social disharmony

AA will move right to AA'. Meanwhile, as a result of urban capital accumulation, with the level of urban social disharmony held constant, the income of urban residents increases more than that of rural-to-urban migrants. Consequently, income disparities wide, i.e. BB shifts upwards to B'B'. Obviously, the value of the social disharmony  $G'$  determined by the intersection of the curve AA' and B'B' will be larger. This brings us to our third proposition:

**Proposition 3** *With economic growth in the urban sector, urban social disharmony caused by the unequal access of urban public services will become more and more severe.*

By combining Proposition 2 and 3, we can see that even if there is no wage difference between rural migrant and native urban, the income disparities caused by the unequal supply of public services will still result in urban social disharmony, which will persist and escalate with urban economic growth. This matches our observation of increasing disharmony in China's urban areas.

## 4 The Equalization of the Urban Supply of Public Service and the Endogenous Policy Transition

### 4.1 The Equalization of the Urban Public Service

According to the analysis above, although the rural labor can move freely and receive the same wage as urban residents, unequal access to urban social public goods is still an important cause of social

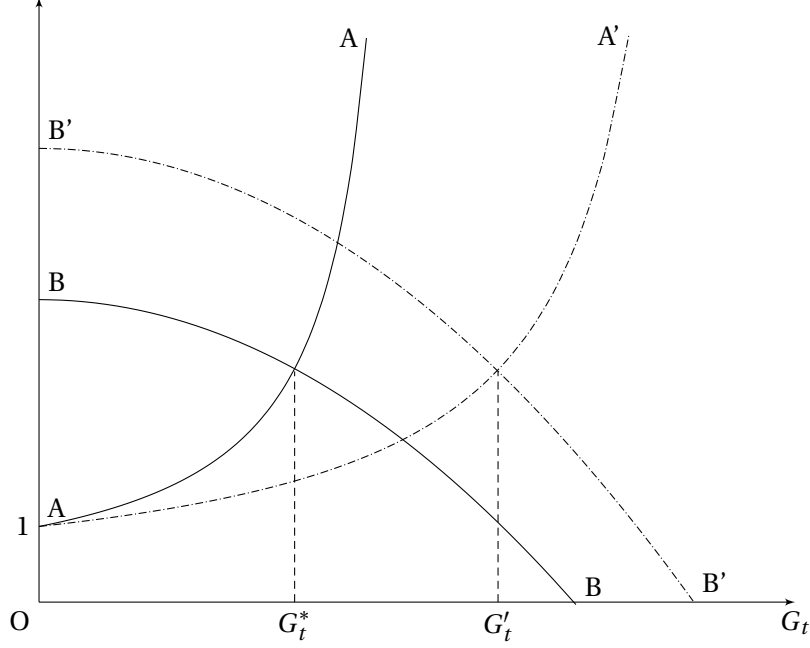


Figure 2: Urban economic growth and social disharmony with unequal supply of urban public services

disharmony. Now we explore an alternative equal access policy for public service supply, i.e. rural migrants in the urban area can share urban public services equally with urban residents. In this case, income disparities within urban areas will no longer exist and the income of the two kinds of labor will be as follows:

$$c_t^E = c_t^{ME} = \frac{(1-s)Y_t}{1+m_t^E} = (1-s)K_t^{1-\alpha}(1+m_t^E)^{\alpha-1}, \quad (17)$$

where the superscript  $E$  exhibits the equalization of public service supply. The equilibrium condition for rural migrants requires their income to satisfy the following equation:

$$c_t^E = c_t^{ME} = (1-s)K_t^{1-\alpha}(1+m_t^E)^{\alpha-1} = (N-m_t^E)^{\beta-1}. \quad (18)$$

Compared with equation (7), the right side of equation (18) does not change, while the left side satisfies the following inequality as the number of migrants  $0 \leq m_t \leq N$ :

$$(1-s)K_t^{1-\alpha}(1+m_t^E)^{\alpha-1} > \alpha K_t^{1-\alpha}(1+m_t^E)^{\alpha-1}.$$

Meanwhile, for  $c_t^E = c_t^{ME}$  now, we always have  $G = 0$ .

We discuss the two alternative policies on public service supply by employing numerical simulations. We set the value of the related parameters as shown in Table 1<sup>7</sup>. The two alternative urban

<sup>7</sup>In fact, our simulation result is not sensitive to the neighborhood value of the parameters. For those parameters larger than 1, we tried other values larger or smaller for every 0.1 incremental change five times respectively. For those parameters smaller than 1, we tried other values larger or smaller for every 0.02 incremental change five times respectively.

**Table 1: Parameter Values in numerical simulation**

Parameters	$\alpha$	$\beta$	$s$	$N$	$K_0$	$\theta$	$\varphi$
Values	0.3	0.5	0.1	5	5	1.6	1.9

economic development paths are shown in Figure 3, where the x-axis represents the time period and the y-axis of (a), (b), (c) and (d) represents the income of urban residents, aggregate output of the urban sector, the urban capital stock and the number of rural-to-urban migrants respectively. The solid lines illustrate the circumstance when only urban residents can benefit from urban public services, while the dashed lines illustrate the equal access scenario. We can see clearly that if urban public services are only available to urban residents, during the early stage of the urban economic growth, i.e. when urban capital accumulation is low, urban residents receive comparatively higher income. However, with urban economic growth, the income of urban residents under the policy of equal access, represented by the dashed lines in Figure 3(a), will rise at a comparatively rapid speed and finally surpass the former. From the perspective of output and capital stock of the urban sector, even during the early stage of urban economic growth, the policy of unequal public service supply that is favorable to the urban residents will lead to slower capital accumulation and lower aggregate output of the urban sector (Figure 3(b), (c)). This implies that even during the early stage of urban economic growth, the policy of unequal public service supply seems to protect the interests of urban residents, but at the cost of output and economic growth of the urban sector. In addition, the equalization of urban public service supply will substantially increase the number the rural migrants (Figure 3(d)), which will greatly promote the process of urbanization. Thus, we arrive at our fourth proposition:

**Proposition 4** *The complete equalization of urban public services will accelerate the process of urbanization, remove income disparities arising from unequal access to public goods and the urban social disharmony caused by it, and advance urban economic growth and the income of urban residents in the long run.*

#### **4.2 The Endogenous Policy Transition When the Government Focuses on the Short-run Income of the Urban Resident**

Although the analysis above demonstrates that the equalization of urban public service supply is beneficial to urban economic development and, beyond a certain stage will also be beneficial to the welfare of the urban residents, the transition of the policy from inequality to equalization is still likely to face obstacles, provided that policy formulation is controlled by the urban residents. To an urban government with the welfare of local residents as the main policy goal, a policy transition that benefits urban residents is more likely to emerge as an endogenous transition process. Therefore,

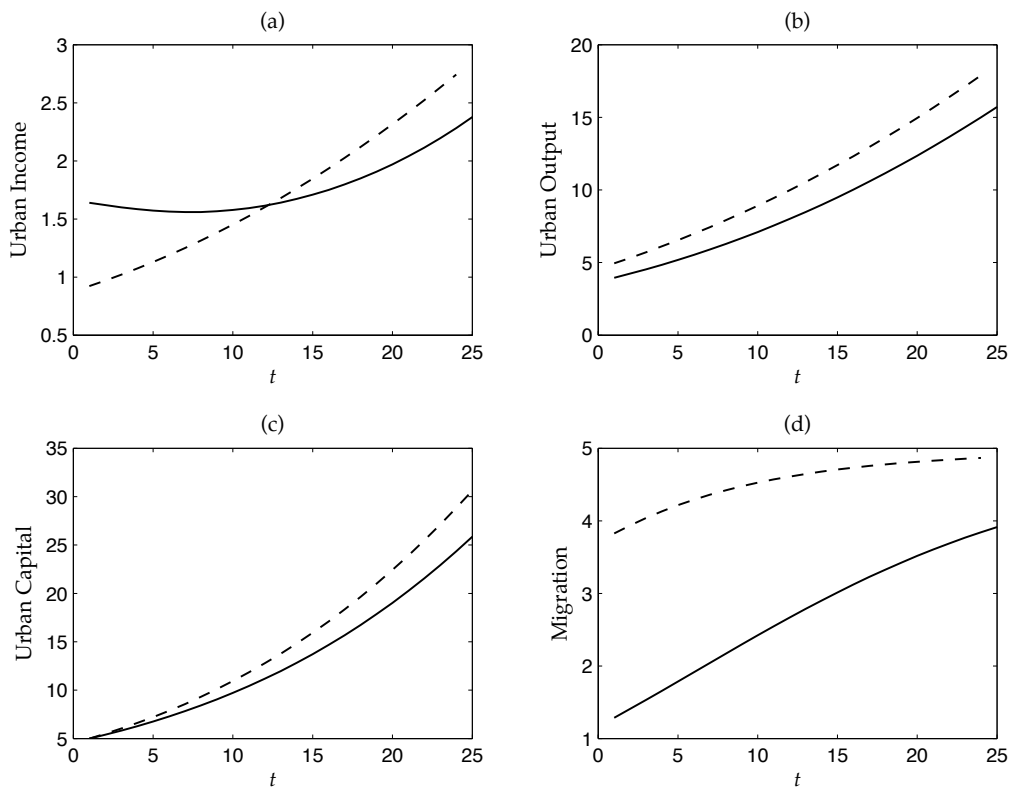


Figure 3: Comparison of two kinds of policies on the urban public service supply

changes in the income of urban residents after the equalization of the public service supply will be a significant parameter to determine whether this transition can be achieved spontaneously. Besides, since the equalization of public service supply will bring a larger increase in the income of urban residents at an advanced stage of urban economic development, the timing for this change the policy will depend on government's attention to the welfare of residents in the long run. In this section, we analyze whether the equalization of public services can be achieved spontaneously, by exploring the effect of the transition of the public service supply policy on the short-run income and permanent income of urban residents.

We first consider the situation in which the urban government maximizes the short-run, or current income of native urban residents as the main policy goal. As shown in Figure 3(a), the two curves representing the urban residents' income under two policies have an intersection point, after which the dashed line representing the equalized public service supply case exhibits that urban residents will get higher income. This is because with urban economic growth, the number of rural-to-urban immigrants increases, and the unequal supply of public services increases the loss from social conflicts arising from rising income disparity, which will decrease the benefits that urban residents obtain from the public services. In other words, when the urban capital stock is still low, the urban government could supply the public service only to urban residents to protect their interests, but after a certain stage of economic growth, it may be better to equalize urban public service supply, which will raise not only the income of the rural migrants, but also the real income of the urban residents, even if the urban government wants to protect the short-run welfare of the local residents. In this sense, we can say that the policy transition of from inequality to equalization of public service supply is likely to be a spontaneous and endogenous transition process.

In Figure 3, the two development paths are independent, but when choosing the timing of the policy transition, the government is not faced with these two independent paths. Assume that during each period, with the urban capital stock held constant, the urban government is able to calculate precisely the income of native urban residents under the two policies of public service supply, and to choose the one with higher income. In Figure 4, the solid line simulates the optimal development path based on the premise above by using the same parameter values as in Table 1, where the dashed line and dotted line still plots the two independent development paths discussed above, i.e. the curves in Figure 3.

We can see clearly that although at the early stage of the urban economic development, the urban government will choose to supply public services only to the urban residents (the solid line and the dashed line are overlapped as shown in Figure 4), but with the urban economic growth, there is a critical point of policy transition (i.e. the inflection point where the solid line begins to deviate from the locus of the dashed line in Figure 4(a)). After the critical point, the equalization policy will be more conducive to the income rise of the urban residents, and meanwhile the output and capital accumulation of the urban sector will increase more rapidly (Figure 4(b), (c)) and the

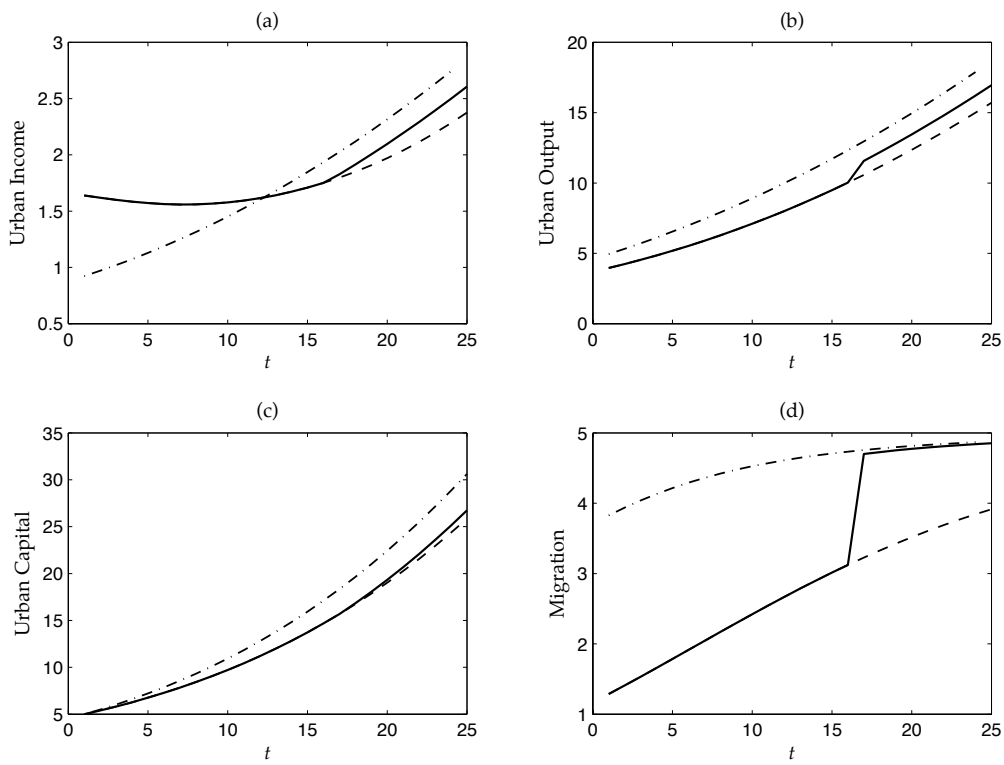


Figure 4: Optimal choice of the public service supply policy and the urban development path: considering the short-run income of the local urban residents

process of urbanization will be accelerated with a large rise in the number of the rural-to-urban immigrants (Figure 4(d)). In fact, at this point with income disparities eliminated, the development of urban society will not be affected and social harmony and stability will be guaranteed. The rise in the income of rural migrants will accelerate the flow of the rural labor force to the urban area, which on the one hand accelerates the urbanization and on the other hand raises the income of the labor force in the rural areas on the premise of free labor mobility. The analysis above can be summarized as the following proposition:

**Proposition 5** *Even if the urban government only takes the short-run benefit of urban natives into account, there is still a critical point in the transition of public service supply policy during the process of urban economic growth. Moreover, this is a spontaneous and endogenous process conducive to the rise of income of both urban residents and the rural migrants, and to advancing urbanization and urban economic growth.*

Figure 4 reveals another interesting phenomenon: the urban government's pursuit of a policy of unequal public service supply at the early stage of urban economic development protects the interests of local urban residents at the expense of decreasing the long-run urban economic growth and a dip in the permanent income of urban residents. Obviously, in Figure 4(b) and (c), although the policy transition to equalization on public service supply accelerates the increase of output and capital accumulation, these are still lower than those on the path of always pursuing the policy of equal public service supply (i.e. the dotted lines in Fig.4). This is also true for the income of the urban residents (Figure 4(a)). In fact, in our model, the loss caused by social conflicts is more than the direct cost itself. In other words, even if the direct losses from social conflicts (crimes, *etc.*) and the non-productive investment in the prevention of them, are not so large, the additional loss from the decelerated urbanization process cannot be ignored. As shown in Figure 4, the levels of urbanization and output are severely driven down at the first stage when the policy has not been changed, and for this reason capital accumulation is also affected, which has more severe negative effects on long-term urban economic development. It is also notable that the critical point of the policy transition is later than the intersection point of the two loci for independent development path in Figure 4, which can be interpreted as the negative effects of the first stage being magnified as a consequence of the lower capital accumulation path.

### **4.3 Endogenous Policy Transition When the Government Focuses on the Long-run Income of Urban Residents**

According to the analysis above, the urban residents' objection to the equalized supply of public service because of their possible short-term income dip brought by the policy transition is harmful to their welfare in the long-run. If aware of this point, is it possible for a government in consideration of the overall long-run welfare of urban residents to adopt a better policy? Let's consider an ideal



situation when the government takes the permanent gross income of the urban residents as the objective function, and examine whether the timing for the optimal policy transition on public service supply will change? In other words, the government faces the following optimization problem:

$$\max_T \sum_{t=0}^T c_t + \sum_{t=T}^{\infty} c_t^E,$$

where  $c_t$  is the income of urban residents before the policy transition, i.e. when the public service is only supplied to urban residents, satisfying equations (14) and (7), while  $c_t^E$  is the income of urban residents after equalizing public service supply, satisfying the equation (18). The numerical simulation results for this optimization problem are shown in Figure 5. Compared with the situation when only the short-run income of the urban residents is taken into consideration in Figure 4, the critical point of the policy transition will be reached faster when their permanent income is taken into consideration instead, i.e. the accelerated economic growth of the urban sector and the elevation of urbanization level will come earlier. Shortly after the critical point comes the temporary income dip for the urban residents, followed by the harmony and integration of urban society, the more rapid development of the urban economic society and at last the more rapid increase in urban residents' income, which can be summarized as the following proposition:

**Proposition 6** *When the urban government considers the long-term interests of the local urban residents, not only is the transition to equalized public service supply a spontaneous and endogenous process conducive to the urbanization and urban economic development, but the critical point of the transition of the public service supply policy will arrive earlier than when only the short-run benefits are considered.*

It is worth noticing that the oblique line appearing at the critical point of policy transition in Figure 4 and Figure 5 exhibits an abrupt jump between two periods before and after, not a gradual transition process. Our model simplifies the urban government's policy choice to a 0–1 choice, thus the policy transition is discrete and abrupt in Figure 4 and Figure 5. In reality, the policy transition is more likely to be continuous and gradual, i.e., the jumpy curve in Figure 4 and Figure 5 may gradually rise.

#### 4.4 Comparative Statics of the Endogenous Policy Transition Point

We further explore the effect of the parameter values on the critical point of policy transition. Here we only change the value of a parameter once from small to large with the range around the values in Table 1 and keep the other parameters unchanged. The changes of the critical point of policy transition are as shown in Table 2. We can find that at least in our value range, the effect of the parameters on the result is monotonic.  $\alpha$  and  $\beta$  represent the output elasticity of labor in urban and rural sectors respectively, and the larger the output elasticity of labor in the urban sector, the larger the loss from restricting the inflow of immigrants, and the earlier the policy transition of the

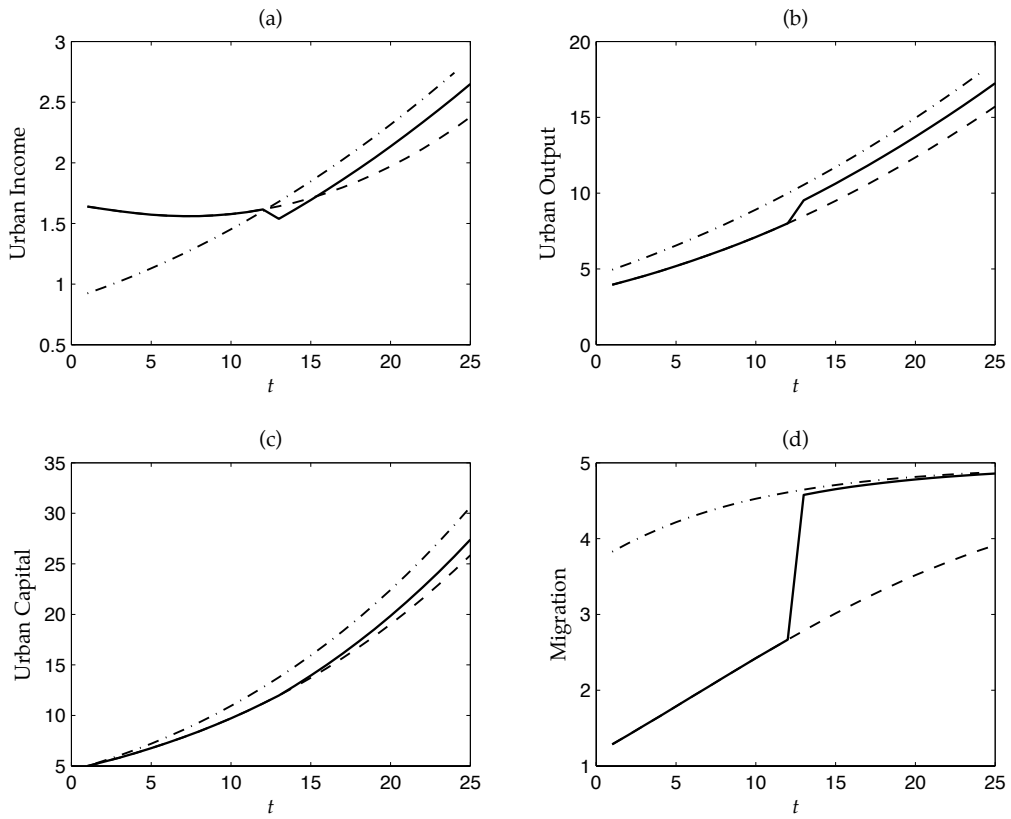


Figure 5: Optimal choice of the public service supply policy and the urban development path: considering the permanent income of the local urban residents

Table 2: Effects of larger parameter values on the critical point of the policy transition

Parameters	$\alpha$	$\beta$	$s$	$N$	$K_0$	$\theta$	$\varphi$
Arrival of the Critical Point	Earlier	Later	Earlier	Earlier	Earlier	Earlier	Earlier

rural-urban integration. On the contrary, the larger the output elasticity of labor in rural sector, the later the policy transition of the rural-urban integration.  $N$  is the total workforce in the rural area, and the greater the total workforce, the lower the *per capita* income in rural area. In this case, the rural-urban integration needs to be achieved earlier to decrease the loss arising from rural-urban disparity. A higher urban initial capital stock  $K_0$  also makes the loss from the rural-urban disparity reach the critical scale earlier, requiring the earlier arrival of the rural-urban integration. Both immigrants' sensitivity to the income disparity  $\theta$  and the amplification coefficient  $\varphi$  of the negative effect of the migration scale on the income disparity will cause greater capital losses in the urban sector and losses from the restriction of urbanization, requiring urban-rural integration to happen earlier as well.

## 5 Conclusions

Development is not only a process of urbanization and industrialization, but should also facilitate the integration of different social groups, including native urban residents and migrants. There still exist institutional discriminations against migrants in urban labor markets and public service access in China and many other developing countries. Our model focuses on the impact of the unequal access to urban public services on urbanization, urban social integration, and urban economic growth. We find that, as long as the urban government does not provide public services equally to urban natives and migrants, there is always social disharmony within urban areas, which is more and more severe with economic growth in the urban sector. In contrast, the complete equalization of urban public services, removing the income disparities that arise from unequal access to public goods and the urban social disharmony caused by it, will accelerate the process of urbanization and increase the pace of urban economic growth.

We further show that, even if urban policy makers take the urban natives' income as their only objective, it is still better to provide equally public service access to the migrants after certain stage of urban development, as the losses under a policy of unequal public service provision increase during the process of urban growth. This decreases the real income of urban natives, and such income losses would ultimately be larger than the benefits to natives derived from their exclusive enjoyment of public services. In other words, policy change from unequal to equal urban public service provision would take place endogenously in the process of urban development.

It's worth noticing that in this paper we only consider the *de facto* income disparity due to un-

equal access to local public services and its impact on urbanization and urban economic growth. In reality there might exist income disparity due to wage discrimination as well as heterogeneity in personal endowment. We do not deny the importance of those public policies for the poor in general. However, the *de facto* income disparity due to unequal access to local public services is relatively easier to observe and more likely to cause social problems, which the local government should set priority to fight against.

Finally, our model also helps us better understand the currently heated debate on Lewis turning point in China. The endogenous policy change in the model implies that China has not run out of surplus labor since rural migrants are still somewhat part of the underprivileged class in urban society in China, which some empirical studies have also pointed out (Knight, Deng, and Li, 2011; Golley and Meng, 2011).

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