

## **Human Capital, Rural-Urban Migration and Wage Differential**

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**Abstract.** In this paper, we construct a theoretical model on recent observations on rural-urban migration of some developing countries and analyse the economic effects of easing migrants' entry. We find that the migration of unskilled rural labour increases social utility, because such workers receive higher wages in the nonagricultural sector than in the agricultural sector. The positive relationship between social utility and the unskilled labour supply continues until the wages of unskilled labour in the nonagricultural sector correspond to those in the agricultural sector. Therefore, we suggest that lifting institutional restrictions to ease migrants' entry is one of the most effective policy tools to address problems related to rural-urban migration in some developing countries in transition.

**Keywords:** Human capital, Migration, Wage differential, Developing country

### **1. Introduction**

Given that the issue of labour migration has been considerably researched for many years, there is a large volume of research data on the subject. As is widely known, Lewis' dual economy model (Lewis, 1954) clearly demonstrates that the most important factor that determines labour migration from the rural area to the urban sector is the wage differential. Other well-known neoclassical theories on the topic include those by Ranis and Fei (1961) and Fei and Ranis (1964).

Todaro's probability employment model (Todaro, 1969; Harris and Todaro, 1970; Todaro, 1980) deals with urban unemployment. The basic theoretical hypothesis of this model is that workers consider the expected rather than the actual urban-rural wage differential, while deciding migration to urban areas.

Since the 1980s, a group led by O. Stark has been developing a new economics of labour migration (NELM) (Lucas and Stark, 1985; Katz and Stark, 1986; Stark 1991a, b). NELM introduces risk, uncertainty, information, and game theory within the field of research, which encompasses both of the factors that determine labour migration (individual and household characteristics, relative status of households in the community, and so forth) and those that determine the migration outcomes (remittances and distribution of income, consumption, agricultural production, and so forth).

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The above-mentioned theoretical framework and methods of empirical analysis are extensively cited in the research on labour migration in China. In this paper, we will refer to these studies and analyse the rural-urban migration in China based on the human capital method. We will pay special attention to China's Household Registration (*Hukou*) System, which is similar to the system in some other developing countries.

The Hukou System introduced in China distinguishes migrant rural labour from urban labour. In other words, rural labour is not allowed to migrate freely, despite the fact that there is a large surplus of rural labour in the agricultural sector (Chen, 2007). Moreover, until recently, rural-urban labour migration was severely controlled and restricted in China by means of the Hukou System.

Although in recent years, there has been a rise in rural-urban labour migration, the institutional restriction on labour migration has still not been abolished. Cai *et al.* (2001) explained that labour market segregation was due to a governmental development strategy that gave priority to the heavy industry and was sustained to provide job security for urban residents. Further, they suggested that a complete range of reforms in various fields is required to abolish completely the Hukou System, which is the institutional basis of employment protection in the labour market.

Song *et al.* (2006) summarised that restriction on institutional migration includes discrimination by means of the Hukou system and discrimination in the fields of employment, social security, and education and career-related training. Yao (2001) demonstrates that rural migrants are excluded from the labour-input areas of society. In other words, they are politically ignored and are economically discriminated.

How has the restriction on institutional migration affected China's economy? Au and Henderson (2006) suggest that severely restricting rural-rural, urban-urban, and rural-urban migration in China leads to insufficient agglomeration of economic activities within both rural and urban areas. Moreover, it results in the first order losses in GDP. It is extremely important to investigate how the restriction on institutional migration affects China's economy. Such investigation will form one of the main bases for the sustainable growth of China's economy in the future; however, this kind of research is rather scarce (Zhao, 2006). Vendryes (2011) shows that, in fairly general circumstances, hukou-related migration constraints can actually hasten development, understood as the transfer of the labour force to the modern sector, driven by capital accumulation, and the hukou system could thus be one of the causes of the extremely high saving rate of China and of the high pace of China's development.

Based on some empirical studies on migrant workers, this paper constructs a theoretical model which is similar to China's economy. Using this model, we analyse the economic effects of easing the entry of rural migrants by means of relaxing and eventually abolishing the institutional restrictions on migration.

The plan of this paper is organised in the following manner. Section 2 summarises the empirical studies readying for the basic model, and Section 3 presents the basic model. The

effects of easing the entry of migrants are analysed in Section 4. Finally, Section 5 summarises the conclusions of this study and suggests policy changes.

## **2. Employment Choices of Rural Labour, Employment Status of Migrant Workers and Human Capital Factors**

Some studies, such as Zhao (1999), Chen and Hamori (2014), generally found that school education plays a positive role in migration when they do employment choices, such as an agricultural worker, a nonagricultural worker or a migrant worker. This is due to at least two factors. First, education provides information advantage in job search (Schwartz, 1973). Second, schooling plays a role in reducing psychic costs of migration (Sjastaad, 1962).

Some studies show that the majority of migrant workers (working primarily in urban areas) were engaged in dirty, difficult and dangerous jobs in the low-level labour market (Meng, 1995; Zhao, 1998). These studies indicate that migrant workers work in the low-level labour market, while urban residents work in the high-level labour market, and that the two labour markets are independent. Cai *et al.* (2005) examined occupational distribution and educational attainment of migrant and local urban workers based on the 0.95‰ questionnaire of the fifth population census 2000. Their study indicated that 92.3 per cent of migrant workers are unskilled workers, and 94.77 per cent of migrant workers are employed in the low-wage sector.

This is probably due to at least two factors. First, human capital of migrant workers is lower than the urban ones. According to the 0.95‰ questionnaire of the fifth population census in 2000, the average periods of education for men and women in urban areas were 8.47 and 9.4, respectively, whereas those for men and women in rural areas were 6.04 and 7.27 years, respectively. Moreover, Chen and Hamori(2014) observed that the migrant workers studied in this research had 8.73 years of education on average in 1999, which is higher than the rural average but lower than the urban average. Consequently, it is not surprising that the majority of migrant workers are employed in the low-level labour market in urban areas.

Second, it is probably due to migrant workers encounter systemic discrimination. Solinger (1999) demonstrated that migrant workers generally work in the urban nonstate-owned sector or the informal sector, and that they are only able to engage in unskilled labour. Wang and Zuo (1999) and Knight, Song and Jia (1999) found that, even for the same job, the wages of migrant workers were significantly lower than those of urban workers; moreover, migrant workers do not receive the welfare benefits that are provided to urban workers. Yang and Chen (2000) and Cai *et al.* (2005) reveal that the wages of workers with rural household registrations are comparatively low, and that registration has a strong effect on the wages of the labour force.

## **3. Basic Model**

The above-mentioned empirical results indicate that (1) human capital factors strongly affect the employment choice of labour in favour of migrant work, and (2) migrant workers are only able to engage in unskilled work because of their lower educational qualifications and

institutional discrimination against them.<sup>1</sup> Based on these findings, we construct a theoretical model based on empirical characteristics of the Chinese economy. Subsequently, we analyse the economic effects of easing the entry of migrants by means of relaxing and eventually abolishing the restriction on institutional migration and eliminating systematic discrimination.

### 3.1. Specification of the model.

3.1.1. **Employment choices of rural households.** The production function of the agricultural sector is given by

$$(3.1) \quad Q_a = aL_a^\alpha, \quad 0 < \alpha < 1, a > 0$$

with  $Q_a$  as the aggregate product and  $L_a$  as aggregate labour in the agricultural sector. The agricultural goods are assumed to be the numeraire and their price is set to unity.

Rural workers who wish to work in the nonagricultural sector usually contact their relatives or governmental or private employment agencies to obtain job information. If they succeed in obtaining adequate job information, they move to urban areas; otherwise, they continue as agricultural labourers. Therefore, migrants rarely remain unemployed.<sup>2</sup> We define the migrant probability,  $c(h_j)$ , as the ratio of the number of individuals who expect to succeed in job seeking activities to the number of individuals who wish to work in urban areas. This ratio is assumed to depend on human capital, which is distributed uniformly over  $[\underline{h}, \bar{h}]$ , and on the strength of institutional barriers to migration. The larger the human capital, the greater are the job opportunities for the applicant of migration.

The migrant probability  $c(h_j)$  of the labour force  $j$  is written as follows:

$$(3.2) \quad c(h_j) = \theta h_j^\beta, \quad \beta > 1, \quad 0 \leq \underline{h} < \bar{h} \leq 1, \quad 0 < \theta \leq 1,$$

where  $c(h_j)$  is a convex function of human capital  $h_j$ .<sup>3</sup> We represent the institutional barrier to migration as  $\theta$ , considering it as a shift parameter of migrant probability.<sup>4</sup>

To simplify the analysis, we assume that the labour force of rural household is unskilled, and that the migrant probability is shared in common by all rural households. Moreover, each

<sup>1</sup> This assumption is reasonable, because the rural-urban migration control policies prevail in the developing countries (Lall *et al.*, 2006; Zhao, 2005; Li and Zhou, 2013).

<sup>2</sup> This supposition is differing from Todaro (1969) where the migrant probability depends on the unemployment ratio in the urban area. This is due to the following two factors. First, the informal labour market is completely competitive in urban areas of China, and the increase of migrant workers will reduce the wage of unskilled labour. That is, an increase of the unemployed affects not quantitatively, but affects the labour supply and demand in urban areas through the effect of decreasing wage. Secondly, agricultural labourers own their arable area; if they succeed in obtaining adequate job information, they move to urban areas; otherwise, they continue as agricultural labourers.

<sup>3</sup> Chen and Hamori (2014) have found that if rural workers receive a higher level of education, the probability of migration from the rural to the urban area will also rise, even at an increasing rate.

<sup>4</sup> Not only the institutional barrier and the worker's ability, but also the economic conditions, for example, the demands for goods or national income, will affect the possibility of migration. This paper will focus on economic effects of the institutional barrier and the worker's ability.

household has to decide in which area he/she works as one unit of labour force, namely either staying in the rural area or moving to urban areas. Their marginal productivity in agriculture is given by  $\alpha a L_a^{\alpha-1}$  and the expected marginal revenue from moving to urban areas will be given by  $w_{nu}c(h_j, \theta)$ , depending on the unskilled labourer wage rate in urban areas  $w_{nu}$  measured in terms of the price of agricultural goods, and also on the migrant probability which depends on their human capital. If  $\alpha a L_a^{\alpha-1} = w_{nu}c(h_j, \theta)$  holds, the household with human capital  $h_j$  is indifferent about which area to work. The value of this human capital depends on the total labour in agricultural sector  $L_a$ . Here, for simplicity, we assume that the households of human capital  $h_j \leq h^*$  stay in rural area and those of  $h_j > h^*$  move to urban areas. Thus the critical level of human capital  $h^*$  and the total labour in the agricultural sector  $L_a$  are both endogenously determined from the following two equations:

$$(3.3) \quad \alpha a L_a^{\alpha-1} = w_{nu} \theta h^{*\beta},$$

$$(3.4) \quad L_a = \int_{\underline{h}}^{h^*} \frac{dh_j}{\bar{h} - \underline{h}} = \frac{h^* - \underline{h}}{\bar{h} - \underline{h}}.$$

Equations (3.3) and (3.4) determine  $h^*$  and  $L_a$  as shown in Figure 1.

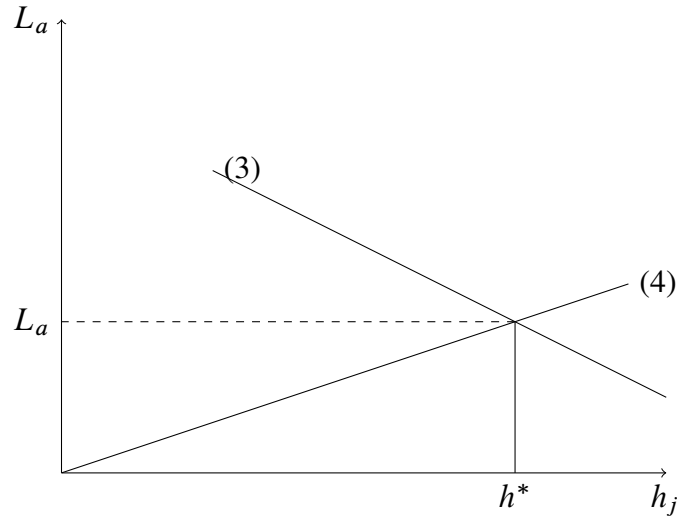


FIGURE 1. Determination of critical human capital and the agricultural labour

Thus, the total labour supply of rural households is divided into the one of households staying in the rural area employed in the agricultural sector and the other of households moving to urban areas employed in the nonagricultural sector as unskilled labour. These division of households are made dependent on their human capital. (See Figure 2.)

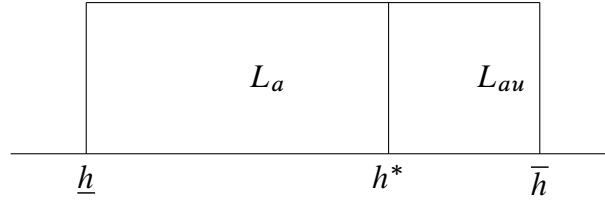


FIGURE 2. The supply of labour force in the agricultural and nonagricultural sectors

As the aggregate rural labour is assumed as unity, we obtain the labour force supply  $L_{au}$  employed in the nonagricultural sector as follows:

$$(3.5) \quad L_{au} = 1 - L_a.$$

3.1.2. **Consumers.** We assume that consumers are characterised by the following Cobb-Douglas social utility function of all households in both rural and urban areas:

$$(3.6) \quad U = C_a^\gamma C_n^{1-\gamma}, \quad 0 < \gamma < 1,$$

where  $C_a$  and  $C_n$  denote quantities of agricultural and nonagricultural goods consumed, respectively, and  $U$  does the social utility function. Consumers maximise the social utility function (3.6) subject to the following budget constraint:

$$(3.7) \quad C_a + PC_n = Y,$$

where  $P$  is the price of nonagricultural goods, and  $Y$  is national income. The price of agricultural goods, which is regarded as the numeraire price in this study, is set to unity. In order to avoid further complications, it is assumed that the economy is a closed one and does not engage in trade with any foreign country. Based on the above-mentioned utility maximisation problem, the following two demand functions are obtained:

$$(3.8) \quad C_a = \gamma Y,$$

$$(3.9) \quad C_n = (1 - \gamma)Y/P.$$

3.1.3. **Producers in the nonagricultural sector.** The producers in the nonagricultural sector are characterised by the following Cobb-Douglas production function:

$$(3.10) \quad Q_n = (A_u L_{nu})^b (A_s L_{ns})^{1-b}, \quad 0 < A_u < A_s, 0 < b < 1,$$

where  $L_{nu}$  and  $L_{ns}$  denote unskilled labour and skilled labour, and  $A_u$  and  $A_s$  stand for labour efficiencies of unskilled and skilled labour, respectively, where  $A_s > A_u$  is supposed.<sup>5</sup>

The producers maximise the following profit function:

$$(3.11) \quad \pi = PQ_n - (w_{nu} L_{nu} + w_{ns} L_{ns}),$$

<sup>5</sup> We will focus on the economic effects of migration, and the conclusion of our paper will not change, even though we take capital into consideration.

where  $\pi$ ,  $w_{nu}$  and  $w_{ns}$  are the profit, the unskilled labour and the skilled labour wage rates, respectively, which are measured in terms of the price of agricultural goods. Solving the profit maximisation problem, the following equilibrium conditions are obtained:

$$(3.12) \quad w_{nu} = bA_u(A_u L_{nu})^{b-1}(A_s L_{ns})^{1-b} P,$$

$$(3.13) \quad w_{ns} = (1-b)A_s(A_u L_{nu})^b(A_s L_{ns})^{-b} P.$$

It should be noted that (3.12) and (3.13) represent that the factor prices are equal to their marginal value products at equilibrium.

**3.1.4. Labour market.** In the model, the domestic labour market is divided into unskilled and skilled labour markets, and there is no wage-leisure tradeoff. Therefore, at equilibrium, unskilled labour and skilled labour are given by

$$(3.14) \quad L_{nu} = l_{nu} + L_{au},$$

$$(3.15) \quad L_{ns} = l_{ns},$$

where  $l_{nu}$  and  $l_{ns}$  represent unskilled labour endowment and skilled labour endowment of the nonagricultural sector, respectively, and they are constant.

**3.1.5. Commodity market.** As a result of the closed economy, the domestic supply of commodities must be equal to the domestic demand.

$$(3.16) \quad C_a = Q_a,$$

$$(3.17) \quad C_n = Q_n.$$

**3.1.6. National income.** Substituting (3.16) and (3.17) into (3.7), we obtain

$$(3.18) \quad Q_a + PQ_n = Y.$$

Using (3.1), (3.3)-(3.6), (3.8)-(3.10) and (3.12)-(3.17), we can obtain 14 endogenous variables, namely,  $U$ ,  $C_a$ ,  $C_n$ ,  $P$ ,  $Y$ ,  $Q_a$ ,  $h^*$ ,  $L_a$ ,  $L_{au}$ ,  $Q_n$ ,  $L_{nu}$ ,  $L_{ns}$ ,  $w_{nu}$  and  $w_{ns}$ .

**3.2. Equilibrium Analysis.** As already stated, from (3.3) and (3.4),  $h^*$  and  $L_a$  will be determined as shown in Figure 1.

$$(3.19) \quad h^* = h^*(w_{nu}, \theta),$$

$$(3.20) \quad L_a = L_a(w_{nu}, \theta).$$

We easily know the effects of a change in  $w_{nu}$  on  $h^*$  and  $L_a$ . In Figure 1 an increase in wage rate  $w_{nu}$  shifts the shape of (3.3) downwards although (3.4) remains the same. Therefore, we obtain  $\frac{\partial h^*}{\partial w_{nu}} < 0$  and  $\frac{\partial L_a}{\partial w_{nu}} < 0$ . Substituting  $L_a(w_{nu}, \theta)$  into (3.5), we can obtain  $L_{au}(w_{nu}, \theta)$  and  $\frac{\partial L_{au}}{\partial w_{nu}} > 0$ .

Further, substituting  $L_{au}(w_{nu}, \theta)$  into (3.14), we obtain  $L_{nu}(w_{nu}, \theta)$  and  $\frac{\partial L_{nu}}{\partial w_{nu}} > 0$ . Substituting the above-mentioned values and equation (3.15) into (3.12), we obtain  $w_{nu} = bA_u [A_u L_{nu}(w_{nu}, \theta)]^{b-1} (A_s l_{ns})^{1-b} P$ , so that

$$(3.21) \quad H(w_{nu}, \theta) \equiv P = \frac{w_{nu}}{bA_u [A_u L_{nu}(w_{nu}, \theta)]^{b-1} (A_s l_{ns})^{1-b}},$$

where  $H(w_{nu}, \theta)$  is increasing *w.r.t.*  $w_{nu}$  and can be interpreted as the equilibrium condition of the labour market. In other words, a higher price  $P$  of nonagricultural goods stimulates its production  $Q_n$  and needs more migrate labour  $L_{au}$  from the rural area, which brings about a rise of the unskilled-labour wage rate in the nonagricultural sector.

Substituting  $L_{nu}(w_{nu}, \theta)$  and (3.20) into (3.1) and (3.10), we obtain  $Q_a(w_{nu}, \theta)$  and  $Q_n(w_{nu}, \theta)$ . Using the above values and substituting (3.16) and (3.18) into (3.8), we obtain  $\gamma [Q_a(w_{nu}, \theta) + P Q_n(w_{nu}, \theta)] = Q_a(w_{nu}, \theta)$ , so that

$$(3.22) \quad G(w_{nu}, \theta) \equiv P = \frac{(1 - \gamma) Q_a(w_{nu}, \theta)}{\gamma Q_n(w_{nu}, \theta)},$$

where  $G(w_{nu}, \theta)$  is decreasing *w.r.t.*  $w_{nu}$  and can be interpreted as the equilibrium condition of the commodity market. In other words, a higher wage rate  $w_{nu}$  in the nonagricultural sector promotes the migration and the nonagricultural production  $Q_n$ , and, on the other hand, decreases  $Q_a$  due to the outflow of rural labour. A rise of the relative ratio of nonagricultural to agricultural productions, at equilibrium, brings about a decrease in relative price  $P$  of non-agricultural goods.

Subsequently, from (3.21) and (3.22), we obtain equilibrium values of  $w_{nu}$  and  $P$ . The results are illustrated in Figure 3.

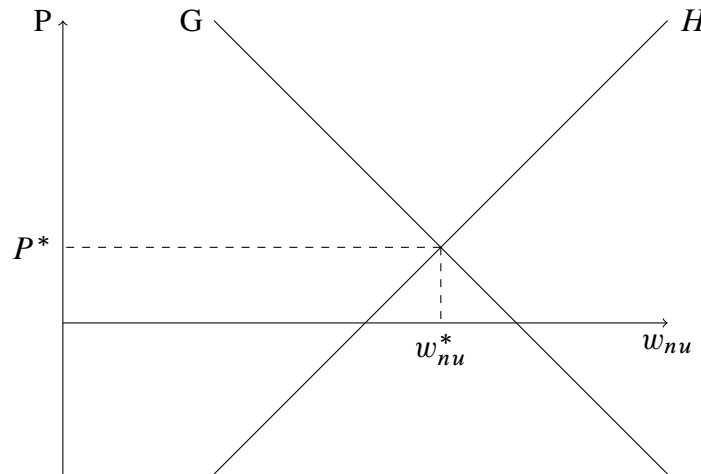


FIGURE 3. Equilibrium values of  $w_{nu}$  and  $P$

#### 4. Effects of Easing the Entry of Migrants

Using the model described in the previous section, the economic effects of easing the entry of migrants (increasing the exogenous variable  $\theta$ ) can be analysed. In our model, we consider



the increase in the exogenous variable  $\theta$  as the easing of the entry migrants. In this section, we theoretically analyse the economic effects of easing the entry of migrants on the endogenous variables.

**4.1. Critical human capital  $h^*$  and agricultural labour  $L_a$ .** The effects of an increase in  $\theta$  on  $h^*$  and  $L_a$ , which is similar as the effect of  $w_{nu}$ , can be analysed by (3.3) and (3.4).

A rise in  $\theta$  shifts the shape of (3.3) downwards from (3) to (3'), although the shape of d (3.4) remains as in Figure 4. Therefore, we obtain that  $\frac{\partial h^*}{\partial \theta} < 0$  and  $\frac{\partial L_a}{\partial \theta} < 0$ , moreover, from equation (3.5) we obtain  $\frac{\partial L_{au}}{\partial \theta} > 0$ .

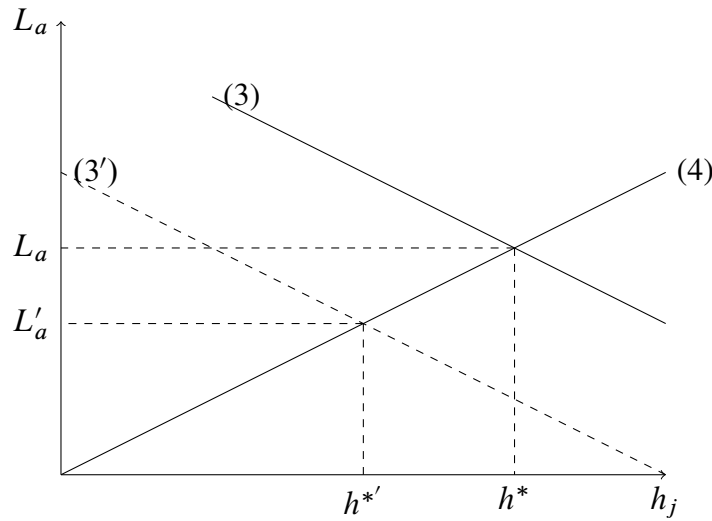


FIGURE 4. Effects of a rise in  $\theta$  on  $h^*$  and  $L_a$

**4.2. Wage rate of unskilled labour  $w_{nu}$ .** Substituting (3.14) into (3.21), we obtain

$$(4.1) \quad H^\dagger(w_{nu}, \theta) \equiv P = \frac{w_{nu}}{b A_u \{A_u [l_{nu} + L_{au}(w_{nu}, \theta)]\}^{b-1} (A_s l_{ns})^{1-b}}.$$

Substituting (3.1), (3.5), (3.10), (3.14) and (3.15) into (3.22), we obtain

$$(4.2) \quad G^\dagger(w_{nu}, \theta) \equiv P = \frac{(1-\gamma)a [1 - L_{au}(w_{nu}, \theta)]^\alpha}{\gamma \{A_u [l_{nu} + L_{au}(w_{nu}, \theta)]\}^b (A_s l_{ns})^{1-b}}.$$

Next, consider the case where  $\theta$  is raised. It is evident that the  $H^\dagger$  curve will shift upwards, but that the  $G^\dagger$  curve will shift downwards due to  $\frac{\partial L_{au}}{\partial \theta} > 0$ . Therefore, we can state that  $w_{nu}$  necessarily decreases when  $\theta$  increases. This change is illustrated in Figure 5.

**4.3. Unskilled labour employment in the nonagricultural sector migrated from the rural area  $L_{au}$ .** From (4.1) and (4.2), we obtain

$$(4.3) \quad w_{nu} = \frac{b(1-\gamma)a [1 - L_{au}(w_{nu}, \theta)]^\alpha}{\gamma [l_{nu} + L_{au}(w_{nu}, \theta)]}.$$

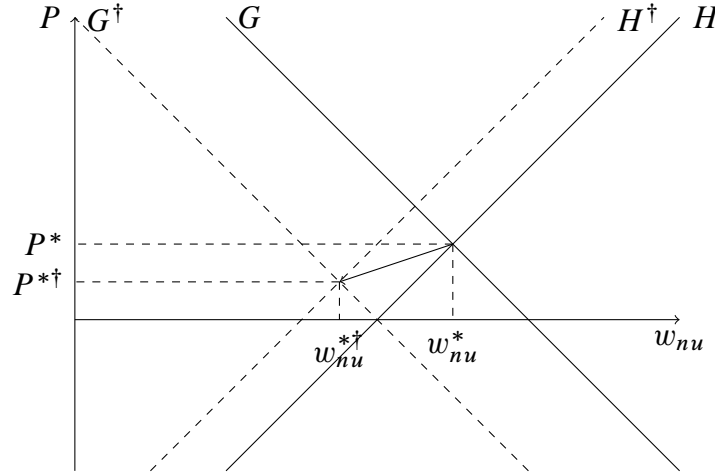


FIGURE 5. Change in the equilibrium values of  $w_{nu}$  and  $P$  with an increase in  $\theta$

From (4.3), we can easily infer that  $L_{au}$  must increase, because we already know that  $w_{nu}$  decreases when  $\theta$  increases. In other words, the effect of an increase in  $\theta$  on  $L_{au}$  can be interpreted as the increasing effect that is directly caused by an increase in  $\theta$ , and the decreasing effect that is indirectly caused by  $\theta$  as a result of a decrease in  $w_{nu}$ . However, the total effect is positive, because the former effect is larger than the latter.

**4.4. Relative price  $P$ .** From (4.2), we can infer that  $P$  will decrease, because the numerator of (4.2) will decrease. At the same time, the denominator will rise due to an increase in  $L_{au}$  caused by an increase in  $\theta$ .

**4.5. Wage rate of skilled labour  $w_{ns}$ .** From (4.2), we obtain

$$(4.4) \quad P(A_u L_{nu})^b = \frac{(1-\gamma)a(1-L_{au})^\alpha}{\gamma(A_s l_{ns})^{1-b}}.$$

Substituting (4.4) into (3.13), we obtain

$$(4.5) \quad w_{ns} = (1-b) \frac{1-\gamma}{\gamma L_{ns}} a(1-L_{au})^\alpha.$$

From the above equation, we can infer that  $w_{ns}$  will decrease when  $\theta$  increases.

**4.6. Wage differential of the nonagricultural sector  $\frac{w_{ns}}{w_{nu}}$ .** From (3.12) and (3.13), the wage differential of the nonagricultural sector  $\frac{w_{ns}}{w_{nu}}$  can be expressed as follows:

$$(4.6) \quad \frac{w_{ns}}{w_{nu}} = \frac{(1-b)L_{nu}}{bL_{ns}} = \frac{(1-b)(l_{nu} + L_{au})}{bl_{ns}}.$$

From the above equation, we can infer that  $\frac{w_{ns}}{w_{nu}}$  will increase when  $\theta$  increases.

4.7. **Social utility  $U$ .** Substituting (3.8) and (3.9) into (3.6), we obtain

$$(4.7) \quad U = (\gamma)^\gamma [(1 - \gamma)/P]^{1-\gamma} Y.$$

By taking natural logarithms of the both sides of (4.7), we obtain

$$(4.8) \quad \ln U = \ln(\gamma)^\gamma (1 - \gamma)^{1-\gamma} + \ln Y - (1 - \gamma) \ln P.$$

By differentiating the both sides of (4.8) *w.r.t.*  $\theta$ , we obtain

$$(4.9) \quad (\ln U)' = (\ln Y)' - (1 - \gamma)(\ln P)'. \quad (4.9)$$

From equation (4.9), we obtain

$$(4.10) \quad (\ln U)' = Y'/Y - (1 - \gamma)P'/P.$$

Equation (4.10) represents that the total welfare effect of easing the entry of migrants can be simplified into the effect of the change in income and the effect of the change in the price of nonagricultural goods.

A tedious but straightforward substitution using the equilibrium conditions yields the basic equation (4.11).

$$(4.11) \quad (\ln U)'Y = a\alpha L_a^{\alpha-1} L'_a + w_{nu} L'_{au} = (w_{nu} - a\alpha L_a^{\alpha-1}) L'_{au}.$$

From the above analysis, it is evident that  $(\ln U)'Y > 0$ .<sup>6</sup> In other words, the result suggests that easing the entry of migrants (increasing  $\theta$ ) will increase the migrant probability  $c(h_j)$  of unskilled labour migrating from the rural area, thereby increasing  $L_{au}$  migrating from the rural area. Further, social utility will increase, because  $L_{au}$  migrating from the rural area will receive the wages of an unskilled worker in the nonagricultural sector, which are more than the wages in the agricultural sector.

From (3.1), (3.5), (3.10), (3.14) and (3.15), we can confirm that  $L_a$  and  $Q_a$  will decrease, but  $Q_n$  will increase when  $\theta$  increases.

Following the above discussion, the economic effects of easing the entry of migrants on the endogenous variables are summarised in Table 1.

TABLE 1. Effects of easing the entry of migrants

Endogenous and Exogenous Variables	$h^*$	$P$	$w_{nu}$	$w_{ns}$	$L_{au}$	$U$	$\frac{w_{ns}}{w_{nu}}$
$\theta$	-	-	-	-	+	+	+

<sup>6</sup> There is a large surplus in the rural labour force in the Chinese agricultural sector.

## 5. Conclusions and Suggestions

Following some empirical results, in this paper, we constructed a theoretical model similar to some developing countries, and subsequently analysed the economic effects of easing the entry of migrants.

We inferred the following. *First*, easing the entry of migrants (increasing the exogenous variable  $\theta$ ) can increase the supply of unskilled labour  $L_{au}$  migrating from the rural area into the nonagricultural sector. On the other hand, the wage rate of skilled labour  $w_{ns}$  and that of unskilled labour  $w_{nu}$  will reduce, because of the increase in  $L_{au}$ ; however, the latter will decrease more than the former. Moreover, the wage differential of the nonagricultural sector  $\frac{w_{ns}}{w_{nu}}$  will widen further. *Second*, the relative price  $P$  will decrease due to an increase in the unskilled labour supply  $L_{au}$ . This is because the supply of agricultural goods  $Q_a$  decreases but that of non-agricultural goods  $Q_n$  increases due to an increase in the unskilled labour supply  $L_{au}$ . *Finally*, social utility  $U$  will increase, because unskilled labour  $L_{au}$  migrating from the rural area will receive the wages of an unskilled worker in the non-agricultural sector, which are more than the wages paid to an unskilled worker in the agricultural sector. The positive relation between social utility  $U$  and the unskilled labour supply  $L_{au}$  will continue until the wages of unskilled labour in the non-agricultural sector are equal to the wages of unskilled labour in the agricultural sector.

Based on the above-mentioned results, we suggest that the entry of migrants should be eased by means of relaxing and eventually abolishing the restriction on institutional migration and eliminating the systematic discrimination against migrant rural workers. It would not be an exaggeration to state that if these policies are strictly implemented, there will be a smooth migration of the surplus rural labour force to urban areas. This, in turn, will form one of the main bases for the sustainable increase of social welfare in some developing countries.

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