

PART 5 Tasks for Development in the 1990's :  
Development Strategies and the International  
Economic System : 32. Industrialization and  
Long-Run Resource Allocation

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## Industrialization and Long-Run Resource Allocation

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In the 1980s, almost all the developing countries, including the Asian countries, implemented structural adjustment measures including devaluation, trade liberalization, relaxation of regulations on foreign direct investment, monetary liberalization, privatization of public corporations, reform of tax-system and other de-regulations. Policy-imposed domestic distortions caused by the "intervention syndrome," therefore, have been largely corrected in these countries. It has been stated that the rational process of industrialization is very much distorted due to the policies related to import substitution. It is hoped that structural adjustment will enable to rationalize the process of industrialization in these countries.

However, there remains another type of domestic distortion which has been recognized as inherent to the economy of developing countries. It has been considered that in developing countries the wages in the manufacturing or in the modern sector exceed the opportunity cost of labor in the economy, the marginal productivity of labour in agriculture or in the rural sector. This type of domestic distortion is inherent to the economy and cannot be easily eliminated simply by policy changes.<sup>1</sup>

In the discussions on export-led industrialization after structural adjustment, the presence of this type of distortion in the economy has seldom been taken into account. Therefore, it has been argued that export-led industrialization would create additional employment opportunities since structural adjustment is expected to reveal the comparative advantages of labor-intensive manufacturing industries. Export-led industrialization is considered to be efficient since a smaller capital would generate more employment. Outward-looking industrialization is also expected to be rational in conferring to the economy of developing countries international competitiveness. In the discussions on export-led industrialization however,

the creation of employment opportunities seems to be much more emphasized.<sup>2</sup>

The purpose of this paper is to outline the issues related to the impact of export-led industrialization on employment creation under the type of domestic distortion we refer to. It has been indicated by international economists that the free trade policy would not be the first-best one when the economy is under our type of domestic distortion.<sup>3</sup> It has also been argued that there is an optimum intervention policy to reach the first-best condition for resource allocation. In this paper, at first, it will be determined whether export-led industrialization is the first-best policy in the context of employment creation under our type of domestic distortion. Bhagwati and Srinivasan showed that a uniform wage subsidy, regardless of the sector of employment, is the first-best solution for static resource allocation when sector-specific sticky wages are strictly fixed as in the case of the Harris-Todaro model.<sup>4</sup> The second problem to analyse is the outcome through industrialization under a uniform wage subsidy as indicated in the Harris-Todaro model.

Our type of domestic distortion would include the Lewis-type, Harris-Todaro-type and Hagen-type. In the Lewis model, a uniform wage in both the rural and industrial sectors is assumed to be different from the opportunity cost of labor in the economy, the marginal productivity of labor in the rural sector. Excess labor is assumed to be absorbed into the agricultural (or rural) sector. On the other hand, all excess labor is assumed to migrate into the urban (or manufacturing) sector in the Harris-Todaro model. In both labor markets, the market mechanism is considered to operate in assuming that wage rates in both the rural and urban sectors are respectively equal to the marginal productivity of labor of both sectors although there is a difference in the marginal productivity of labor. In the Hagen model, the existence of wage differentials in the rural and urban sectors is implied and in this paper, domestic distortion of the Harris-Todaro-type is assumed.

## 1. The Harris-Todaro Model and Labor Markets in Developing Countries

### (1) The Harris-Todaro Model<sup>5</sup>

Let us start by constructing the model, which can then serve as a framework within which the various aspects of labor markets in developing countries can be analyzed. Essentially, there are two sectors, rural and urban. In its simplest form, the Harris-Todaro model contains six variables: The rural labor force, the rural wage, the level of urban employment, and the number of migrants from the rural to the urban sector. Migration serves as the link (and equilibrating variable) between the two sectors.

The relations in the basic model are as follows:

$$X_r = X_r(L_r, K_r) \quad (1)$$

$$\partial X_r / \partial L_r = W_r \quad (2)$$

$$P(\partial X_u / \partial L_u) = \bar{W} \quad (3)$$

$$W_r = (L_u / (L_u + U)) \cdot \bar{W} \quad (4)$$

$$L = L_r + L_u + U \quad (5)$$

$$X_u = X_u(L_u, K_u) \quad (6)$$

where:

$L_r$  is the labor employed in the rural sector, an endogenous variable,  
 $L_u$  is the labor employed in the urban modern sector, endogenous variable,  
 $U$  is the unemployed labor in the urban area, also endogenous,  
 $W_r$  is the rural wage assumed to be equal to the expected urban wage,

$(L_u/L_u + U) \cdot \underline{W}$ , endogenous,

$X_r$  is the quantity of production in the rural areas, endogenous,

$X_u$  is the quantity of production in the urban modern sector, endogenous.

Exogenous variables are as follows:

$\underline{W}$ : the urban minimum wage in terms of rural product,

$K_r$ : capital employed in the rural sector,

$K_u$ : capital employed in the urban modern sector,

$L$ : the total labor force,

$P$ : the relative price of the urban product in terms of the price of the rural product.

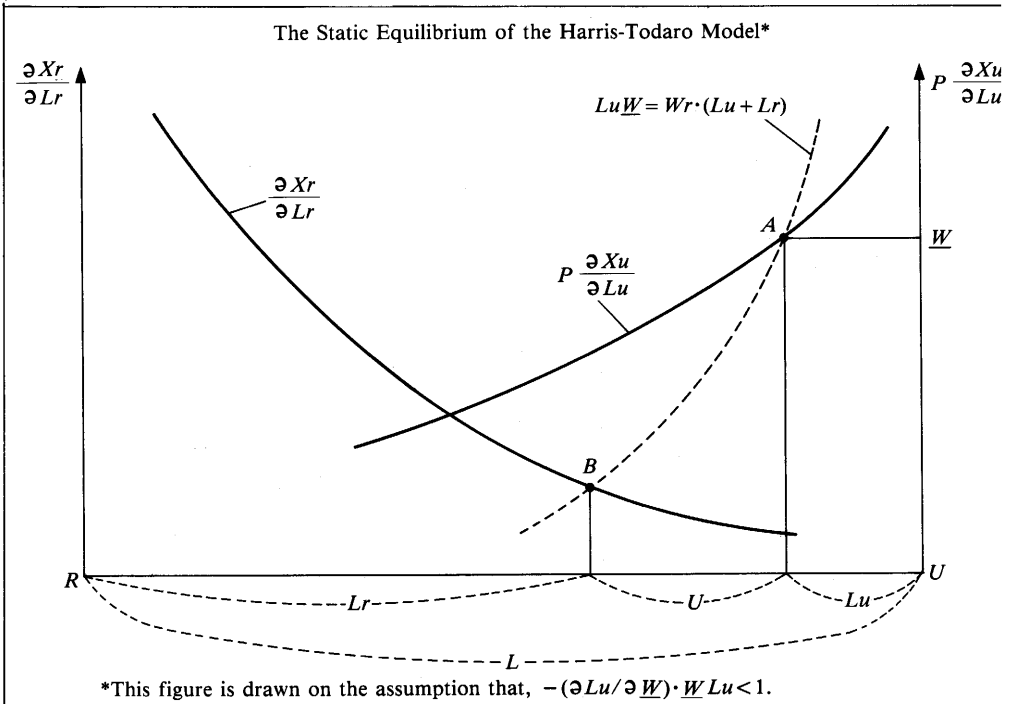
As already indicated above, in the Harris-Todaro model, the following migration function is implicitly assumed:

$$(L_u + U) = M ((L_u/(L_u + U)) \cdot \underline{W} - W_r)$$

where  $M' > 0$ ,

$$(L_u + U) = d(L_u + U) = \text{changes in the urban labor force.}$$

On the basis of the migration function, the total urban labor force,  $(L_u + U)$  is determined at the point where  $W_r = (L_u/(L_u + U)) \cdot \underline{W}$ . As is well known, the static equilibrium can be depicted in the following figure.



Employment equilibrium in the urban modern sector is at the point, A, while the equilibrium point of employment in the rural sector is at the point, B, in the figure. We can observe that the urban wage,  $\underline{W}$  is higher than the rural wage,  $Wr$ —the marginal productivity of the rural labor employed. In that sense, the Harris-Todaro model assumes that there exists *domestic distortion* in the labor market. And it can be easily seen that the existence of this domestic distortion is closely related to the existence of the *minimum wage*,  $\underline{W}$ , in the modern urban sector. Furthermore, because of the instantaneous adjustment of labor allocation through migration excess labor assumes to be absorbed into the urban sector as the unemployed (or as employment in the urban informal sector).

## (2) The Harris-Todaro Model and Labor Markets in Developing Countries

Lewis' classic and pertinent contribution stated that because the rural population was large, labor was likely to be in highly elastic supply for non-rural activities in the early stages of development. "Highly elastic" was quickly interpreted to mean that this supply could be reallocated at zero price, or at least opportunity cost lower than the rural wage, and that labor could be considered as virtually a free good from the viewpoint of resource allocation.

It was assumed in the Lewis' model that, in the traditional rural sector the egalitarian principle is institutionalized in distribution while the principle of *output maximization* is operating in production. In other words, the marginal principle or market mechanism does not operate in the traditional rural sector. It must be admitted that many aspects of labor markets in the rural areas in developing countries are not well understood. Nevertheless research demonstrated that labor markets in developing countries functioned substantially better—in that the farmers respond to the economic incentives given—than it had previously been assumed. Many microeconomic studies on migration and peasant agriculture have provided conclusive evidence<sup>6</sup> that rural laborers respond to economic incentives in allocating their time. It can be concluded, therefore, that as far as the operation of the rural labor markets in developing countries, is concerned, the Harris-Todaro model is much more relevant and closer to the reality. It is quite natural to accept the assumption of the Harris-Todaro model that rural laborers migrate freely in response to an expected wage rate and are employed at the point where the marginal productivity of labor is equal to the market wage rates.

The second essential assumption of the Harris-Todaro model is that there is a downward rigidity of wages in the urban modern sector. Most of the recent discussions on urban labor markets in developing countries have been dominated by hypotheses about the existence of different levels of wages for labor of the same quality in different forms of the market. These market sectors are differentiated by the terms "formal and informal," "organized and unorganized," "modern and traditional." In relation to the hypotheses, the assumption of the Harris-Todaro model can be restated as: there is a formal or protected labor market in the urban areas, with downward rigidity of wages.

The basic distinction between the high- and low-wage levels of the sector is in some sense based on "protection," so that wage levels and working conditions in the protected sector are not available, in general, to job seekers unless they manage somehow to get across that protective barrier. This type of protection may arise from the intervention of trade unions, governments, or both. Examples of such institutional practices are widespread in the less developed world.

Government interventions include such phenomena as legislation directly controlling both conditions of employment (including job security provisions) and fringe benefits (including social insurance, housing and training), the legal framework within the public sector (which can be very wide in many developing countries).

Depending upon the nature of the regulations and their enforcement, the impact on the labor market can vary. Employers may not be willing to hire additional labor, for example, because of their inability to lay off workers once on the payroll, thus tilting their behavior toward selection of more capital-using techniques and production activities than might prevail in the absence of such enforced legislation. Minimum wage legislation may reduce the incentive to employ unskilled laborers. Greater enforcement of these kinds of regulations in large and modern (sometimes foreign) industrial enterprises than small-scale activities can and usually does lead to a segmented labor market, with workers vying for jobs in the high wage, heavily regulated activities or in the public sector.

It must be pointed out, however, that the market mechanism of labor rather than the institutional systems mentioned above, can itself lead to the prevalence of a protected sector in the urban labor market. This phenomenon may occur as a result of the correlation between worker's efficiency and the wage level. Up to a certain level, the increase in the wage per worker increases the efficiency which compensates for the increase in the wage, so that the wage cost per unit of output falls. After a certain level, obviously, the wage increase results in a less proportionate increase in efficiency, and there will be no incentive for the management to increase the wage level further. Even the existence of an excessive supply of labor, will not induce the management to reduce the wage to the lowest level possible. The wage level thus fixed will ensure the minimum wage cost per unit of existing employee's output.

It must be explained why this mechanism cannot be applied to all the firms in the urban sector. First, it is because the functional relationship between wage and efficiency tends to be higher for enterprises which use modern technology and employ a large number of workers. Second, the type of wage policy mentioned above is more appropriate to the enterprises with a stable labor force. In sectors of the urban labor market which have a high turnover, the stable correlation between a given level of efficiency and wages will be lost. Due to this correlation some firms may want to pursue a high-wage policy to keep a stable labor force. Once stability is achieved, further increase in wage may be expected as the correlation between wage levels and efficiency becomes more firmly established.

Thus, even the free market mechanism may lead to a higher wage level in some types of enterprises than that in other sectors of the same market. This wage level is the protected one in a sense that job seekers who may wish to obtain employment in the sector depend upon a process of selection involving aptitude tests as well as competition for the limited number of available jobs.

These considerations lead to another hypothesis about the nature of the formal or organized sector in addition to the institutional protection previously mentioned. In the discussions about both institutionally-based and market-based protection, we have referred to firms that employ modern technology and achieve a high labor productivity. Such firms typically also use a wider range of formal work arrangements for their employees than other sources of labor market. This situation leads to a distinction between the formal and informal sectors based on the belief that workers in firms using modern technology enjoy a protection structure that is qualitatively different from the unprotected market structure prevailing for hawkers, peddlers, and other groups in the informal sector of the market. This special type of formal sector protection may exert a relatively significant quantitative impact on the earnings in the sector.

The applicability of all the hypotheses mentioned above to the reality of labor markets in developing countries, depends upon the in-depth analysis of empirical tests. Nevertheless, many fragmented or individual country studies<sup>7</sup> seem to suggest that the basic assumptions of the Harris-Todaro model relating to the labor markets in developing countries are valid. It could be concluded that, the market mechanism is prevailing in the rural labor market of developing countries while there is a urban sector, the formal or organized sector with downward rigidity of wages, belonging to either the institutionally-based or market-based type.

## **2. Industrialization under Domestic Distortion—Comparative Static Analysis**

In this section, the impact of industrialization on employment will be analyzed by applying the method of comparative statics, under the assumption that the mechanism of the Harris-Todaro's model is operating in developing countries. Industrialization will be specified simply as the expansion of the modern (or protected) sector in the urban areas either by capital accumulation or by technological change, or both.

### **(1) Industrialization under Free Trade**

As suggested earlier, our type of domestic distortion, which is specified within the framework of the Harris-Todaro model, cannot be corrected by current structural adjustment. In other words our type of domestic distortion tends to persist even under a free-trade system.

Now let us assume that industrialization is induced by the expansion of exports of manufactured products through the enhancement of international competitiveness achieved by structural adjustment. Furthermore, it is assumed that industrialization is expressed in our model simply by capital accumulation in the modern

manufacturing (organized or protected) sector. In the rural sector (agricultural sector) too, capital accumulation is assumed to proceed. In addition, the total labor supply is assumed to increase. On the basis of the orientation of exogenous variables, the trend of employment will be examined.

First we can derive the following relation by differentiating both sides of (3) and rewriting it as:<sup>8</sup>

$$\widehat{L}u = \sigma u \cdot (\widehat{P} - \widehat{W}) + \widehat{K}u \quad (7)$$

where

$$\widehat{L}u = dLu/Lu, \widehat{W} = dW/W, \widehat{P} = dP/P, \widehat{K}u = dKu/Ku,$$

$$\sigma u = -(\sigma Lu/\sigma W) \cdot (W/Lu) (= \text{wage elasticity of labor demand in the urban sector})$$

It is obvious from (7) that industrialization ( $\widehat{K}u > 0$ ) will definitely increase the employment opportunities in the urban modern sector if there is no adverse effect through the deterioration of the terms of trade against the urban sector ( $\widehat{P} < 0$ ) and through the increase in the minimum wage ( $\widehat{W} > 0$ ). It must be pointed out also that the trend of employment,  $\widehat{L}u$  is independent of the employment trend in the rural sector.

By combining (2) with (4) and totally differentiating the equation combined we can obtain the following function:<sup>9</sup>

$$(1 + \frac{\sigma r \cdot Sr}{1 - Sr}) \cdot \widehat{L}r = Kr + (\frac{\sigma r}{1 - Sr}) \widehat{L} - \sigma r (\widehat{W} + \widehat{L}u) \quad (8)$$

where

$$\sigma r = -(\partial Lr/\partial Wr) \cdot (Wr/Lr) \text{ (wage elasticity of labor demand in the rural sector),}$$

$$Sr = Lr/L, \widehat{L}r = dLr/Lr, \widehat{K}r = dKr/Kr, \widehat{L} = dL/L, 1 > Sr > 0, \sigma r > 0.$$

Since  $(1 + \sigma r \cdot Sr/(1 - Sr)) > 0$  and  $(\sigma r/(1 - Sr)) > 0$  in (8), capital accumulation in the rural sector ( $\widehat{K}r > 0$ ) and the increase in the total labor force would exert a positive impact on employment in the rural sector ( $\widehat{L}r > 0$ ). On the other hand, equation (8) shows that the increase in employment in the urban sector ( $\widehat{L}u > 0$ ) results in a decrease in employment in the rural sector ( $\widehat{L}r < 0$ ). It should be emphasized here that the employment trend in the rural sector is not independent of that in the urban sector as equation (8) shows.

By totally differentiating (5) and using the equations (7) and (8), the following trend of urban unemployment (or, employment in the urban informal sector) can be obtained.

$$\begin{aligned} Su \cdot \widehat{U} = & \left\{ \frac{(1 - Sr)}{(1 - Sr) + \sigma r Sr} \right\} \widehat{L}r + \left\{ \frac{Sr(1 - Sr)}{(1 - Sr) + \sigma r Sr} \right\} \widehat{K}r \\ & - \left\{ \frac{(1 - Sr)Sr\sigma r}{(1 - Sr) + \sigma r Sr} \right\} \widehat{W} + \left\{ \frac{(1 - Sr)Sr\sigma r}{(1 - Sr) + \sigma r Sr} - Su \right\} \widehat{L}u \end{aligned} \quad (9)$$

where,

$$Su = U/L, \widehat{U} = dU/U, Su = Lu/L, Su, Su > 0,$$

Since  $(\frac{1 - Sr}{(1 - Sr) + \sigma r \cdot Sr}) > 0$ ,  $(\frac{Sr(1 - Sr)}{(1 - Sr) + \sigma r \cdot Sr}) > 0$  and  $(\frac{\sigma r \cdot Sr(1 - Sr)}{(1 - Sr) + \sigma r \cdot Sr}) > 0$  in



equation (9), the positive changes in the total labor force ( $\widehat{L} > 0$ ) and in the minimum wage in the urban sector ( $\widehat{W} > 0$ ) will definitely lead to the increase in urban unemployment ( $\widehat{U} > 0$ ) or increase in employment opportunities in the urban informal sector. Capital accumulation in the rural sector ( $\widehat{K}r > 0$ ), however, would result in a decrease of urban unemployment.

As can be seen from (9), however, the direction of the impact of the increase in urban employment (the impact of industrialization) on urban unemployment, is not necessarily definite. It depends upon the initial conditions ( $Sr$ ,  $Su$ ) and the magnitude of the wage elasticity of the labor demand in the rural sector. In order to examine the relationship between the initial conditions in terms of employment share and the direction of the impact of industrialization in terms of employment, let us define the following function:

$$S = \frac{(1 - Sr)\sigma r}{(1 - Sr) + \sigma r Sr} - Su = Z_1 - Z_2 \tag{10}$$

where,  $Z_1 = \left( \frac{(1 - Sr)\sigma r}{(1 - Sr) + \sigma r Sr} \right)$ ,  $Z_2 = Su/Sr$ , and  $S$  = the fourth term in equation (9).

To examine the sign of  $S$  in (10), we draw the following figures. Figure (1) shows that  $Z_2$  is always larger than  $Z_1$  ( $Z_1 < Z_2$ ) for whatever the value of  $Sr$  is, when  $Su$  is large enough ( $1 > Su > 1/4$ ). This assumption implies that the increase in employment opportunities in the urban manufacturing sector (due to industrialization) can always reduce urban unemployment in such an economy with an already larger employment share in the urban manufacturing sector ( $1 > Su > 1/4$ ). On the other hand, when the share of employment in the urban protected sector is not yet large enough ( $1/4 > Su > 0$ ), for a wider range of  $Sr$ ,  $Z_1 > Z_2$ . In other words, industrialization or employment expansion in the urban manufacturing sector may result in the increase of urban unemployment.

Figure 1. The case of  $\sigma r = 1$ .

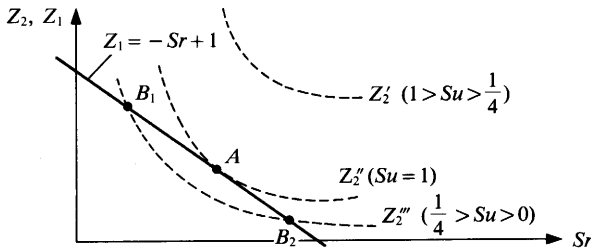


Figure 2.  $1 > \sigma r > 0$

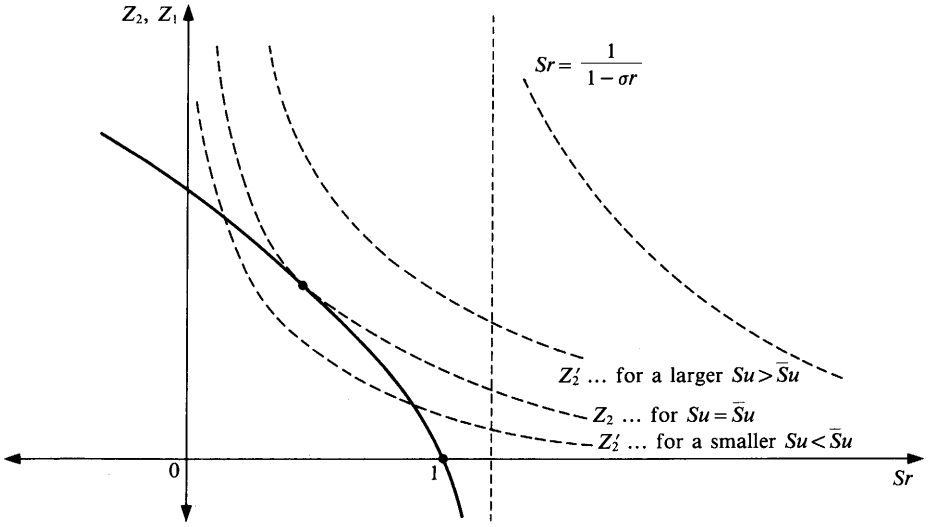
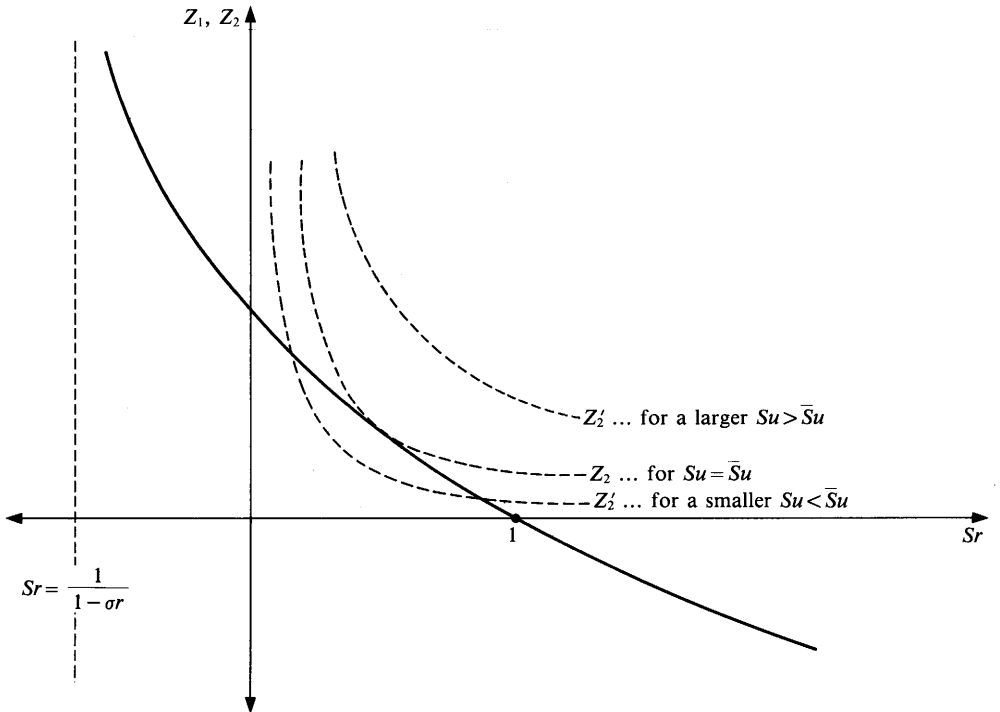


Figure 3.  $\sigma r > 1$



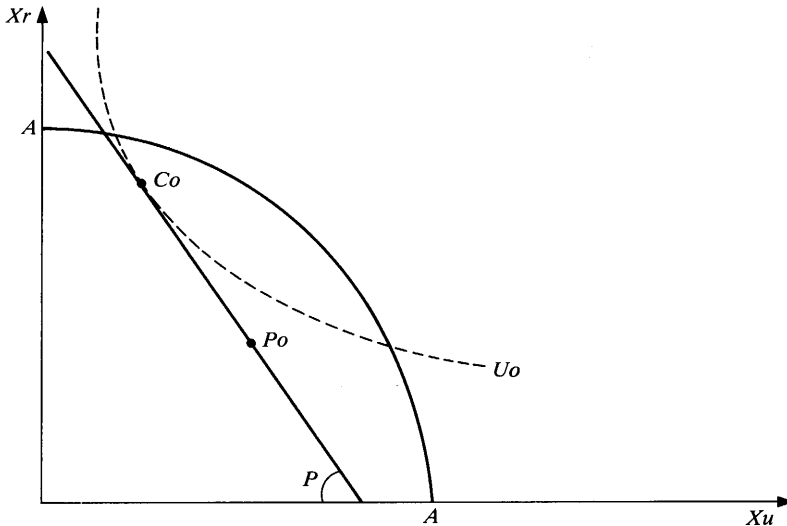
Figures 2 and 3 show the cases of  $1 > \sigma r > 0$  and  $\sigma r > 1$  respectively. In these figures,  $Z_2'$  is drawn for a larger  $Su$  while  $Z_2''$  is depicted for a smaller  $Su$ .  $A$  is a point where  $Z_1$  is tangent to  $Z_2$  and  $S=0$ . Then,  $Su$  can be defined as a point corresponding to  $A$  and the conclusion drawn from these figures is the same as that from Figure 1. In the case of a large employment share in the urban manufacturing sector ( $Su > \overline{Su}$ ), the impact of the increase of employment opportunities in the urban manufacturing sector on urban unemployment is always negative. On the other hand, in an economy with a small employment share ( $Su < \overline{Su}$ ), the impact is positive (increase in urban unemployment).

These analyses lead us to the general conclusion that the expansion of urban employment by industrialization may result in the increase of urban unemployment in an economy with a rather narrow urban industrial base (in terms of employment share), while in an economy with a rather wide industrial base, it may result in urban employment through either capital accumulation ( $\widehat{Ku} > 0$ ) in the urban sector or a favorable change of the urban product in terms of trade ( $\widehat{P} > 0$ ). It can be asserted, therefore, that under our type of domestic distortion the uniform application of the export-led industrialization strategy to all the developing countries regardless of their initial conditions would not be effective in reducing urban unemployment in particular.

## (2) Industrialization under the Optimum Intervention Policy

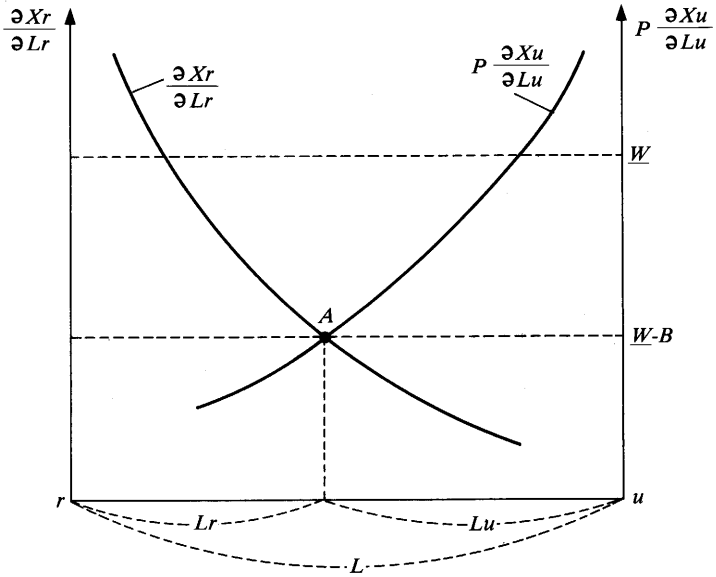
Since there is a discrepancy in the marginal productivity of labor between the rural and the urban sector, free trade is not the optimum policy. The free trade equilibrium of the open Harris-Todaro model under the assumption of a small

Figure 4. Free Trade Equilibrium\*



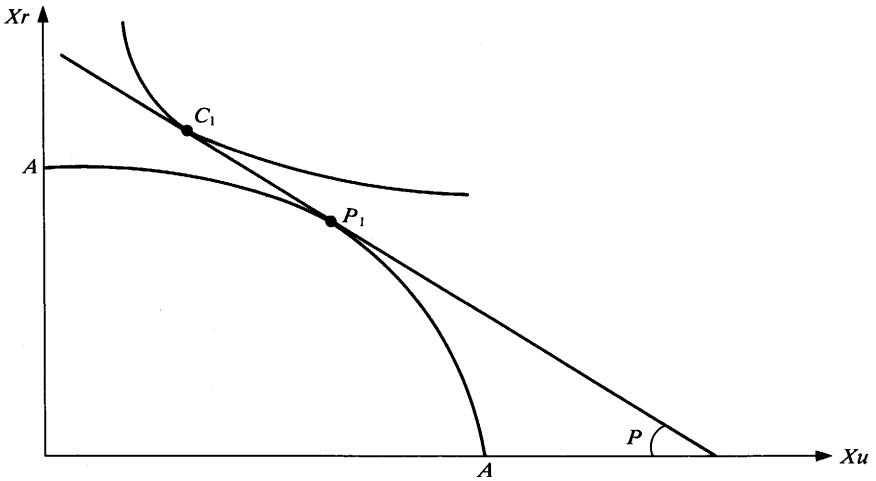
\* $Po$ : Production Point  
 $Co$ : Consumption Point  
 $P$ : International price

Figure 5. Equilibrium under Optimum Intervention Policy  
 (A) Employment Equilibrium\*



\*B = the uniform wage subsidy.

(B) Trade Equilibrium\*\*



\*\* $P_1$ : production point,  $C_1$ : consumption point,  $P$ : international price.

country is shown in Figure 4. In this figure,  $P$  is assumed to be an international relative price.  $Po$  is an equilibrium point of production while  $Co$  is a consumption point. Therefore, the urban product is assumed to be exported while the rural product is assumed to be imported.  $Uo$  is the level of social welfare in equilibrium. The figure shows that our equilibrium is not the optimum point since the production point,  $Po$ , is located within the production frontier,  $AA$ .

Bhagwati and Srinivasan [6] suggested that the optimum intervention policy under such circumstances is to allocate a uniform wage subsidy to both sectors. The equilibrium employment in the rural and the urban sectors, (2) and (3), can be rewritten under this intervention policy, as follows:

$$\frac{\partial Xr}{\partial Lr} = \frac{W-B}{Lr} \quad (2')$$

$$P \frac{\partial Xu}{\partial Lu} = \frac{W-B}{Lu} \quad (3')$$

The equilibrium of the model under the optimum intervention policy is shown in Figure 5. In Figure 5-A the employment equilibrium is indicated while the trade equilibrium is drawn in figure 5-B.

Figure 5-A shows that full employment is reached by allocating the uniform wage subsidy to both sectors. At point  $A$  in Figure 5-A, the marginal productivity of labor is equalized in the rural and the urban sectors. The production point,  $P_1$  is, therefore, located on the production frontier,  $AA$  in Figure 5-B.

Now, let us analyse, by using the comparative static method, the dynamic property of this equilibrium under the optimum intervention policy. By totally differentiating (2') and (3'), and rewriting these, we can derive the following equations:

$$\widehat{Lr} = \widehat{Kr} + (\sigma r / (1 - m_B)) \cdot (m_B \cdot B - \widehat{W}) \quad (11)$$

$$\widehat{Lu} = \widehat{Ku} + (\sigma u / (1 - m_B)) \cdot (m_B \cdot B - \widehat{W}) + \sigma u \cdot \widehat{P} \quad (12)$$

where,

$\widehat{B} = dB/B$ ,  $m_B = B/\widehat{W}$ ,  $1 > m_B > 0$  because  $(W-B)$  should be positive. Since  $(W-B)$  should be always positive, the subsidy results in the increase of employment in both sectors (because  $(\sigma r / (1 - m_B))$  and  $(\sigma u / (1 - m_B))$  are positive.)

It should be emphasized, however, that an increase in employment in both sectors can be realized only by the reduction of the marginal productivity of labor in both sectors when  $B$  is so high that  $\widehat{B} > \widehat{W}/m_B$ . Obviously, this process will not continue in the long-run because a point may be eventually reached where the marginal productivity of labor becomes negative. If the urban minimum wage ( $\widehat{W}$ ) is raised fast enough (for example,  $\widehat{W} > m_B \cdot \widehat{B}$ ), the increase of employment opportunities in both sectors would be reduced by this factor even though the uniform wage subsidy,  $B$ , is increasing.

Let us totally differentiate equation (5) by putting  $U$  at zero. Then, by using (11) and (12), and rewriting these, we can obtain the following function:

$$\widehat{L} = (1 - Sr) \left\{ \widehat{Ku} + \left( \frac{\sigma u}{1 - m_B} \right) \cdot (m_B \cdot B - \widehat{W}) + \sigma u \cdot \widehat{P} \right\} + Sr \left\{ \widehat{Kr} + \left( \frac{\sigma r}{1 - m_B} \right) \cdot (m_B \cdot B - \widehat{W}) \right\} \quad (13)$$

By solving (13) by  $\widehat{B}$ , we can obtain the following function which indicates the

required level of  $B$  to sustain full employment when  $\widehat{L}$ ,  $\widehat{K}u$ ,  $\widehat{K}r$ ,  $\widehat{W}$ ,  $\widehat{P}$  are exogenously given. Furthermore,

$$\widehat{B} = \left\{ \frac{(1-m_B)}{m_B((1-Sr)\sigma u + Sr\sigma r)} \right\} \cdot \widehat{L} + (1/m_B) \cdot \widehat{W} \\ - \left\{ \frac{(1-m_B)}{m_B((1-Sr)\sigma u + Sr\sigma r)} \right\} \cdot \{ (1-Sr)\widehat{K}u + Sr \cdot \widehat{K}r + (1-Sr) \cdot \sigma u \cdot \widehat{P} \}, \quad (14)$$

where,

$$(1-m_B) > 0, m_B > 0, (1-Sr) > 0, Sr > 0, \sigma u > 0, \sigma r > 0.$$

$\widehat{W}$  must be larger than  $m_B \cdot \widehat{B}$  if the marginal productivity of labor rises in the process of economic growth. By inserting this function ( $\widehat{W} > m_B \cdot \widehat{B}$ ) into equation (14), we can obtain the following equation:

$$\left\{ \frac{(1-m_B)}{m_B\{(1-Sr)\sigma u + Sr \cdot \sigma r\}} \right\} \\ \cdot \{ \widehat{L} - [(1-Sr) \cdot \widehat{K}u + Sr \cdot \widehat{K}r + \sigma u \cdot (1-Sr) \cdot \widehat{P}] < 0 \quad (15)$$

Since  $\frac{(1-m_B)}{m_B(1-Sr)\sigma u + Sr \cdot \sigma r} > 0$  in (15), we can derive the following equation from (15).

$$(1-Sr)\widehat{K}u + Sr \cdot \widehat{K}r + \sigma u \cdot (1-Sr) \cdot \widehat{P} > \widehat{L} \quad (16)$$

It is obvious from (16) that economic growth with a rising marginal productivity of labor is possible if  $\widehat{K}u$  is high enough under the given level of  $\widehat{L}$  (growth rate of the total labor force). It should be also emphasized here, however, that capital accumulation in the rural sector ( $\widehat{K}r$ ) and a favorable change in the terms of trade for the urban product ( $\widehat{P} > 0$ ) would also contribute to achieving such an economic growth. In the case of developing countries, the employment share in the rural sector ( $Sr$ ) is large enough. It could be asserted, therefore, that fast capital accumulation in the rural sector ( $\widehat{K}r$  is high enough) can be a more efficient strategy to achieve economic growth with a rising marginal productivity of labor than capital accumulation in the urban sector. In other words, industrialization is not necessarily an efficient strategy within our framework.

Finally we would like to examine the trend of the uniform wage subsidy in the process of economic growth with full employment achieved by an optimum intervention policy. For the marginal productivity of labor in both sectors to rise in the process of economic growth,  $\widehat{W}$  must be larger than  $m_B \cdot \widehat{B}$  ( $\widehat{W} > m_B \cdot \widehat{B}$ ) as already pointed out. In addition to this condition, let us add extra condition,  $\widehat{B} < 0$ . Of course this condition does not contradict the condition of  $(\widehat{W} - m_B \cdot \widehat{B}) > 0$ . By imposing the condition of  $\widehat{B} < 0$  in equation (14), we can obtain the following function:

$$m_B \left\{ \frac{(1-Sr)\sigma u + Sr \cdot \sigma r}{(1-m_B)} \right\} \cdot \widehat{W} + \widehat{L} < \{ (1-Sr)\widehat{K}u + Sr\widehat{K}r + (1-Sr)\sigma u \cdot \widehat{P} \} \quad (17)$$

Compared with (16), it appears that  $\{ (1-Sr)\widehat{K}u + Sr\widehat{K}r + (1-Sr)\sigma u \cdot \widehat{P} \}$  needs to be higher if  $B < 0$  by  $\left\{ \frac{(1-Sr)\sigma u + Sr\sigma r}{(1-m_B)} \right\} \cdot \widehat{W}$  than if  $\widehat{W} > m_B \cdot \widehat{B}$ .

It is possible to achieve economic growth either if  $\widehat{Ku}$  is high,  $\widehat{Kr}$  is high, or if both are high. There is a process of economic growth led by industrialization (= a high  $\widehat{Ku}$ ), with the reduction of the level of the uniform wage subsidy ( $\widehat{B} < 0$ ), but with the increase of labor productivity in both sectors. It must be emphasized, however, that industrialization is not the only way to achieve such a growth process. Under the conditions in prevailing in developing countries ( $Sr$  is large enough), capital accumulation in the rural sector (= a high  $\widehat{Kr}$ ) can be a more efficient strategy to adopt.

### 3. Free Trade and Comparative Advantage under Domestic Distortion

The applicability of the simple Hecksher-Ohlin model of international trade to developing countries after structural adjustment, seems to be accepted by those who advocate on export-led or outward-looking strategy of development, as if our type of domestic distortion did not exist. Therefore, it is stated that a well-functioning factor market would ensure that a low wage rate in a developing country with a large labor force would decrease the production cost for relatively labor-intensive commodities compared with a country with a larger amount of capitals. For a country with a very large labor force, protection could induce positive production levels of more capital-intensive goods that would not be produced under the free trade system. Hence, quite clearly, with protection it is expected that for a country with a large labor force, the capital intensity of protected industries would be higher than that of export and of import-competing industries that would be able to remain competitive internationally under the free trade system. On the basis of the reasoning mentioned above, it is usually considered that the decision to shift from a more protected trade system to a more open trade system would imply a shift in the commodity composition of output toward more labor-intensive activities, and this would shift the demand for labor outward.

The reasoning mentioned above essentially depends upon the assumption that the factor market is functioning well. However, if the factor market is not functioning well, in other words, if there is any distortion in the factor market, the real comparative advantage would not be revealed under free trade.

Brecher, Helpman, Jones and Magee have developed models of trade under the assumption that a factor market distortion prevails. It may be a legislated or union-imposed real wage rate higher than would be consistent with full employment or it may be similar to a wage constraint applicable to the formal sector in the Harris-Todaro model.

It has been demonstrated by these studies that, in the presence of these sorts of rigidities, almost anything can happen. In particular, the "wrong" good, i.e. the good which would be imported under an efficient allocation of resource, might be exported; the commodity which would be labor-intensive when identical factor prices would confront producers in both sectors could become capital-intensive if a sufficiently higher wage prevailed than that in the rest of the economy; the right commodity might be exported, but with the wrong factor proportions, and there might be open unemployment.

There are also important links between the nominal exchange rate and the real wage rate. It can be argued that, in some countries, a depreciation of the nominal exchange rate is effective precisely because it lowers the real wage rate, at least in terms of traded goods. On the other hand, an over-valued exchange rate in a country with a large labor force may make the real wage sufficiently high to reduce or wipe out the comparative advantage of labor-intensive industries, and devaluation may be an instrument for lowering the real wage rate.

All these arguments could be applicable to the urban sector in our Harris-Todaro model. Furthermore, in such a model, it is assumed that there are segregated labor markets with different levels of real wage. Therefore, even though there is a homogeneous capital market throughout the economy, revealed comparative advantage would change, depending upon the rate of return (= rental) on capital. It could be concluded that, here too, anything could happen. In this sense, the essential predictions on the effects of export-led industrialization under the free trade system remain uncertain.

#### **4. Concluding Remarks**

Various aspects of export-led or outward-looking industrialization which could be realized by the implementation of a structural adjustment policy remain to be elucidated. In this paper, the labor market distortion of the Harris-Todaro type which is considered to remain even after the implementation of a structural adjustment policy, was extensively examined in the context of a dynamic growth process, hence contributing to the clarification of the effect of export-led industrialization.

It was shown that urban open unemployment could increase if the export-led industrialization strategy was adopted under the free trade system. Then, it was argued that industrialization under the optimum intervention policy would lead to a more efficient process of growth. The decrease in the wage subsidy could lead to industrialization with full employment. Finally it was shown that the real comparative advantage would be revealed only by chance under the free trade system, suggesting that the implementation of structural adjustment policy would not necessarily lead to export-led industrialization in a developing country as such.

It can be concluded that the success of export-led or outward-looking industrialization seems to be dubious in the long-run perspective of resource allocation.

#### **NOTES**

1. This type of distortion is associated with the name of Arthur Lewis, Evelet Hagen, and Harris-Todaro.
2. For example, refer to Anne O. Krueger.
3. See, for example: Harry G. Johnson.
4. Please refer to: Jagdish N. Bhagwati and T.N. Srinivasan.



5. Harris, J.R. and Todaro, M.
6. Regarding this point, refer, for example, to: Berry, A. and Sabot, R.H.
7. Please refer to, for example: Dipak Mazumdar (1973), Dipak Mazumdar (1981), Binswanger, Hans P. and Rosenzweig, M.R., Squire, Lyn.
8. To derive this relationship, we used the assumption that production function,  $X_u = X_u(K_u, L_u)$  is homogeneous of degree one.
9. We derive this relation by assuming that  $X_r(K_r, L_r)$  is homogeneous of degree one.

## REFERENCES

- Anne O. Krueger, *Trade and Employment in Developing Countries, 3, Synthesis and Conclusions*, National Bureau of Economic Research, 1983.
- Berry, A. and Sabot, R.H. "Labor Market Performance in Developing Countries: A Survey." *World Development*, 6, pp. 1199–242, 1978.
- Binswanger, H.P. and Rosenzweig, M.R. *Contractual Arrangements, Employment, and Wages in Rural Labor Markets in Asia*, Yale University Press, 1984.
- Brecher, Richard M. "Minimum Wage Rates and the Pure Theory of International Trade." *Quarterly Journal of Economics*, 8, pp. 96–116, 1974.
- Dipak Mazumdar, "Labor Supply in Family Industrialization: The Case of the Bobmay Textile Industry," *Economic History Review*, Vol. 26, pp. 477–96, 1973.
- . *The Urban Labor Market and Income Distribution, A Study of Malaysia*, Oxford University Press, 1981.
- Hagen, E.E. "An Economic Justification of Protectionism," *Quarterly Journal of Economics*, 72, pp. 496–514, 1958.
- Harris, J.R. and Todaro, M. "Migration, Unemployment, and Development: A Two-Sector Analysis." *American Economic Review*, 60, pp. 126–142, 1970.
- Harry G. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortion." in R. Caves, H.G. Johnson, and P.B. Kenen, eds. *Trade, Growth and the Balance of Payment*, Rand McNally, 1965.
- Helpman, Elhanan, "Nontraded Goods and Macroeconomic Policy under a Fixed Exchange Rate." *Quarterly Journal of Economics*, 91, pp. 469–80, 1977.
- Jagdish N. Bhagwati and T.N. Srinivasan, "On Reanalyzing the Harris-Todaro Model: Policy Rankings in the Case of sector-Specific Sticky Wages." *American Economic Review*, 64, pp. 502–508, 1974.
- Jones, Ronald W. "A Three-Factor Model in Theory, Trade and History" in Jagdish Bhagwati et al. *Trade, Balance of Payments and Growth*, North-Holland, 1971.
- Lewis, W.A. "Economic Development with Unlimited Supplies of Labor," *Manchester School*, 21, pp. 139–191, 1954.
- Magee, Stephen P. *International Trade and Distortions in Factor Markets*, Marcel Dekker, 1976.
- Squire, Lyn. *Employment Policy in Developing Countries: A Survey of Issues and Evidence*, Oxford University Press, 1981.