I. Introduction

Many urban centers in developing countries are plagued by high rates of unemployment. Yet, despite the fact that large numbers of urban workers are unemployed, urban centers still experience high rates of rural-to-urban migration. A natural policy response has been to focus on job creation in urban sector, which in some cases has actually led to an increase in unemployment. Noting the presence of this phenomenon, Michael Todaro, in 1969, formulated a model of rural-to-urban migration that predicts what is now known as the Todaro Paradox: that job creation will lead to increased urban unemployment. A year later, however, Todaro and his thesis advisor, John Harris, developed a model (HT model) that predicts that subsidies for urban labor employment will increase real income and lead to lower urban unemployment rates.

Economists may argue that the different conclusions reached by these two models stems from their decision to focus either on the short term or the long term. A. G. Blomqvist, however, argues that the two models reach different conclusions because the Todaro model focuses on the flow of migration while the HT model focuses on the stock of rural and urban labor. Todaro assumes that the urban labor market adjusts slowly to equilibrium making migration flows the most important policy variable, yet HT assumes that these adjustments occur instantaneously so that the stocks of labor are central. Still, despite these differences, Blomqvist proposes a model that synthesizes the Todaro and HT approaches by accounting for the speed of reaction to migration by including the job turnover rate. Using his model, Blomqvist highlights some key assumptions underlying the Todaro and HT models, some of which help explain the empirical observations of Todaro. Blomqvist ends by considering the HT model’s recommendation for an employment subsidy and noting the need for dynamic modeling in this area.

II. The Todaro Model and the HT Model

A. Todaro’s Model

The focus of Todaro’s model is on migration flows. He is concerned with finding an equilibrium between flows of migration and the rate of change in unemployment. In modeling rural-urban migration, Todaro makes four behavioral assumptions:
1. The percentage change in the urban labor force due to migration during a period is governed by the differential between discounted streams of expected real income.
2. Each worker’s planning horizon is identical.
3. The fixed costs of migration are identical for every worker.
4. The discount factor is constant over the planning horizon and it is identical for all workers.

Based on these assumptions, Todaro formulates his model of rural-to-urban migration, which Blomqvist introduces in a general form:

\[ M = f(w, p) \]

\[ \frac{E}{E} \]

where \( M \) is the flow of rural-to-urban migration per unit of time, \( E \) is the number of employed workers, \( w \) is the urban-rural wage differential, and \( p \) is essentially the “probability of getting a job.” There is a positive relationship between \( M \) and both \( w \) and \( p \). While Todaro uses a discrete-time variable for \( p \), Blomqvist simplifies \( p \) by using a continuous time variable so that \( p \) is defined as:

\[ p = \frac{\dot{E}}{E} = g \frac{E}{U} \]

where \( U \) is the number of unemployed individuals in the urban labor force and \( g \) is the rate of growth of new urban jobs in proportion to the number of employed workers, defined as:

\[ g = \frac{\dot{E}}{E} \]

As Blomqvist notes, however, depending on the unit of time being measured, \( p \) can exceed one, so strictly speaking, \( p \) cannot be a probability. Therefore, Blomqvist defines a measure, \( 1/p \) as the expected duration of unemployment for an immigrant who has just arrived in the city. Implicit in this measure is the assumption that all workers have the same chance of being selected for a new job.

After setting out this equation, Blomqvist makes a criticism of Todaro’s model, which will be an important element of the model that he later adopts to synthesize the Todaro and HT approaches. Blomqvist points out that Todaro’s model does not account for the fact that the probability of getting a job increases not only when new jobs are created, but also from the turnover of workers in jobs already created. He therefore introduces a new variable, \( b \), that measures the rate of job turnover. As a result, \( p \) is defined as:

\[ p = \frac{(b+g)E}{U} \]
B. Harris-Todaro (HT) Model

Blomqvist next contrasts the Todaro model with the HT model. While the Todaro model focuses on the flow of migration, the HT model is concerned with the stock of migration in static equilibrium where migration \((M)\) is equal to zero. Their model is a two-sector model that accounts for rural and urban labor. Rural areas are exclusively agriculture-oriented and urban areas are exclusively manufacturing-oriented. In addition, there is a permanent urban sector and a rural sector. The rural sector can either use all of its labor on agricultural goods or it can split its labor between agricultural goods and sending workers to the city.

The model assumes that migration occurs as a response to differences between the expected earnings in rural and urban areas and that the urban unemployment rate is the equilibrating force. Moreover, HT notes the presence of a politically-determined minimum wage that is substantially higher than the agricultural wage.

The basic form of their model, which is the equilibrium condition for \(M = 0\) is:

\[
w_a = \frac{w_mE}{(U+E)}
\]

where \(w_a\) is the agricultural wage (rural wage) and \(w_m\) is the manufacturing wage (urban wage). \(U\) is the number of unemployed workers and \(E\) is the number of employed workers. This relationship can be interpreted as saying that:

Urban migration equals zero where the agricultural wage is equal to the expected wage in manufacturing, defined as the manufacturing wage times the employment rate \((E/(E+U))\), or the probability that a randomly selected worker will be holding a job.

When the rural-urban wage differential is greater than zero, that is, when the expected rural wage is less than the expected urban wage, rural-to-urban migration will be positive.

Implicit in the HT model are a number of assumptions:

1. Every member of the labor force has an equal probability of obtaining a job
2. The turnover rate, what Blomqvist refers to as \(b\), is infinitely large, so that \(E/(E+U)\) is equal to the fraction of time that an urban worker is employed.
3. Labor allocation adjusts quickly to a parameter change so that a comparison of full stock equilibrium demonstrates the effects of a parameter change.
4. Production in both sectors exhibits increasing but diminishing marginal returns to labor.

Although Blomqvist does not mention what underlie the \(w_a\) and the \(w_m\) variables, it is helpful for a more complete understanding of the HT model. From HT (1970), \(w_a\) and the \(w_m\) represent the following relationships:

\[
w_a = pq^*; \\
p = (PM/PA)\rho; \text{ where } \rho^* > 0
\]
where $p$ is the price of the agricultural good in terms of the manufactured good and

$$\text{wm} = f'$$

where $f'$ is the marginal product of labor in manufacturing. Based on these relationships, HT predicts that a wage subsidy from the government can be welfare improving if the following is true:

$$f' > pq'(dN_u/dN_m)$$

where $(dN_u/dN_m)$ is the change in urban migration with respect to a change in the amount of labor required to produce total urban output. Essentially, this means that a wage subsidy to create one additional job will be welfare improving if the marginal product of urban labor is greater than the relative marginal product of agricultural labor, adjusted for the migration that is induced by the creation of an additional job.

C. Comparing the Todaro Model and the HT Model

While the Todaro model predicts that job creation policies will increase unemployment rates in urban centers, the HT model offers a case in which a wage subsidy can be welfare improving. According to Blomqvist, underlying the differences in these predictions are the following points:

1. Todaro focuses on rural-to-urban migration as a flow variable while the HT model views migration as a stock variable (where $M = 0$)
2. In viewing migration as a stock variable, the HT model assumes that the economy adjusts to equilibrium very quickly while Todaro views the adjustment to be slower, which is why he focuses on the flows of migration
3. The assumption that Blomqvist makes is that Todaro implicitly views the $b$ variable (urban job turnover) to be zero while the HT model implicitly takes the view that $b$ approaches infinity.

III. Synthesis

In this section, Blomqvist presents an alternative model of rural-urban migration. He calls his model a synthesis of the Todaro and HT models because it explicitly incorporates speed of adjustment. (Recall that the Todaro model implicitly assumes that the speed with which the economy adjusts to equilibrium is slow while the HT model assumes speed of adjustment is fast). Blomqvist then uses his model to discuss and compare the short-term and long-term impact of job creation and changes in the wage differential on urban unemployment.
Like Todaro, Blomqvist begins by assuming that the flow of migration \((M)\) is negatively correlated with the duration of unemployment \((1/p)\). Furthermore, he assumes that there exists a critical value of \(p = \pi(w, b)\), such that the flow of migration is equal to zero. As noted, \(\pi\) is a function of the wage differential \((w)\) and the turnover rate \((b)\). The zero migration condition can be stated as follows:

\[
\begin{align*}
M > 0 & \text{ as } p > \pi \\
M = 0 & \text{ as } p = \pi \quad \text{ where } p = [(g + b)E]/U \\
M < 0 & \text{ as } p < \pi
\end{align*}
\]

The zero migration condition can also be restated in terms of a critical value of unemployment \((\bar{u})\), rather than a critical value of \(p\). For example:

\[
\begin{align*}
M > 0 & \text{ as } \ldots p > \pi \\
& \quad [[(g + b)E]/U > \pi \\
& \quad [(g + b)E]/\pi > U \quad \text{ where } \alpha = 1/\pi. \\
& \quad \alpha(g + b)E > U
\end{align*}
\]

Repeating the above process we obtain:

\[
\begin{align*}
M > 0 & \text{ as } \alpha(g + b)E > U \\
M = 0 & \text{ as } \alpha(g + b)E = U \quad \text{ where } \alpha = 1/\pi \\
M < 0 & \text{ as } \alpha(g + b)E < U
\end{align*}
\]

Blomqvist implicitly uses formulation of the zero migration condition when he states that migration will be positive only if \(U\) is less than some critical value \(\bar{u} = \alpha(g + b)E\). The smaller the difference between actual unemployment \(U\) and critical unemployment \(\bar{u}\), the smaller the flow of migration at any point in time.
So far, the Blomqvist model closely tracks the Todaro model (although Blomqvist includes the turnover rate as a parameter, unlike Todaro). Next, Blomqvist departs from the previous models by incorporating a variable that describes the speed with which migrants adjust to changes in the other parameters. He calls this variable $\lambda$. It can loosely be thought of as the elasticity of migration with respect to the actual probability of finding a job. He begins by writing his model in terms of critical unemployment:

\[(6) \quad M = \lambda(\bar{u} - U) \quad \text{where} \quad \lambda > 0\]

We can immediately see that his model assumes a linear relationship between the flow of migration and the difference between critical unemployment and actual unemployment. In other words, the rate of change of $M$ does not depend on the parameters. Blomqvist rewrites the equation:

\[(7) \quad M/E = \lambda[\alpha(g + b) - U/E]\]

At this point, Blomqvist proceeds to discuss: (1) the short and long-term effects of a change in the rate of urban job creation (2) the short and long term effects of a change in the wage differential and (3) the short and long term cross-effect of the wage differential and the rate of urban job creation on unemployment. In all three cases, Blomqvist uses the proportional rate of growth of unemployment ($\dot{U}/U$) to discuss short-term effects on unemployment and the equilibrium rate of unemployment ($U/E$)\* to discuss long-term effects on unemployment. He derives the equation for the equilibrium rate of unemployment as follows:

At a given point in time:

\[\dot{U} = M - \dot{E}\]
\[\dot{U}/E = M/E - \dot{E}/E\]
\[\dot{U}/E = M/E - g \quad \text{where} \quad g = \dot{E}/E\]
\[(9) \quad \dot{U}/E = \lambda[\alpha(g + b) - U/E - g] \quad \text{substituting from equation (7)}\]
Furthermore:

\[
\frac{d(U/E)}{dt} = (E\dot{U} - U\dot{E})/E^2 \\
= \dot{U}/E - gU/E \\
= \lambda(\alpha(g + b) - U/E) - g - gU/E \quad \text{substituting from equation (9)} \\
= \lambda(\alpha(g + b) - g - (\lambda + g)(U/E))
\]

At equilibrium:

\[
\frac{d(U/E)^*}{dt} = 0 \\
\lambda(\alpha(g + b) - g - (\lambda + g)(U/E)^*) = 0 \\
\lambda(\alpha(g + b) - g) = (\lambda + g)(U/E)^* \\
\text{(10)} \quad \frac{[\lambda(\alpha(g + b) - g)]}{(\lambda + g)} = (U/E)^*
\]

First, Blomqvist considers the short-term effects of an increase in the rate of job creation (an increase in \(g\)) on unemployment. From equation (9):

\[
\dot{U}/E = \lambda(\alpha(g + b) - U/E) - g \\
(U/E)(\dot{U}/U) = \lambda(\alpha(g + b) - U/E) - g \\
\dot{U}/U = (E/U) \lambda(\alpha(g + b) - U/E) - g(E/U) \\
d(\dot{U}/U)/dg = (E/U) \lambda(\alpha - (E/U) \\
= (E/U) (\lambda \alpha - 1)
\]

We can see that in order for the Todaro paradox (increasing the rate of job creation causes increased unemployment) to hold \(\lambda \alpha > 1\). Intuitively this makes sense, because the higher \(\lambda\), the greater the elasticity of migration with respect to the probability of finding a job. In
addition, $\alpha$ is the ratio of unemployment to job openings at which migration would be equal to zero. If people respond quickly to an increase in jobs and are willing to move to the city even when there is high unemployment then job creation is more likely to increase unemployment in the short-term.

Second, Blomqvist considers the long-term effects of an increase in $g$. From equation (10):

\[
\frac{(U/E)^*}{\lambda \alpha (g + b) - g} / (\lambda + g)
\]

\[
d(U/E)^*/dg = [(\lambda \alpha - 1)(\lambda + g) - (\lambda a g + \lambda a b - g)] / (\lambda + g)^2
\]

We can see that the condition for the Todaro paradox to hold depends on the relative sizes of $\lambda$, $\alpha$, and $b$. If $b = 0$ (as the Todaro model assumes) then the condition for the Todaro paradox to hold is the same for the short-term and long-term. From this fact, Blomqvist concludes that Todaro’s emphasis on the difference between short-term and long-term effects was misleading. However if $b > 0$, the long-term impact of job creation on unemployment is more likely to be favorable, i.e. decrease the ratio of unemployment. Assuming that an urban area with a higher level of employment has a higher turnover rate $b$, this implies that a larger urban area is more likely to show favorable responses to the same increase in job growth keeping the other parameters constant.

Third, Blomqvist concludes that the effect of changes in the wage differential will have a positive impact on the short-run rate of growth of unemployment and the long-run equilibrium rate of unemployment. This follows from the assumption that the critical expected duration of unemployment ($\alpha$) is positively correlated with the wage differential.

\[
\partial(U/E)/\partial w = (\lambda E/U)(\partial \alpha / \partial w)(g + b)
\]

\[
\partial(U/E^*)/\partial w = (\partial \alpha / \partial w)[\lambda(g + b)(\lambda + g)]
\]

Finally, Blomqvist considers how the level of the wage differential influences the impact of job creation on unemployment.
(14) \[ \frac{\partial^2 (\dot{U}/U)}{\partial g \partial \dot{w}} = \frac{(\lambda E/U)(\partial \alpha/\partial w)}{} > 0 \]
\[ \frac{\partial^2 (U/E^*)}{\partial g \partial \dot{w}} = (\partial \alpha/\partial w)[\lambda(\lambda - b)/(\lambda + g)^2] \]

These equations show that the amount by which an increase in the rate of job growth influences unemployment depends upon the magnitude of the wage differential. In the short-term, the higher the wage differential the greater the impact of a change in the growth of new job creation will have on the rate of change of unemployment. In the long-term, the cross-effect is positive whenever \( \lambda > b \). This means that increases in the wage differential magnify the impact of a change in the growth of new job creation whenever \( \lambda > b \).

**IV. Empirical Migration Functions, the Todaro Paradox and the Effects of Employment Subsidies**

**A. Implications for the Todaro Paradox**

In his 1976 paper, Todaro developed an empirical test for his model. He began by defining the elasticity of the rural–urban migration with respect to urban employment probabilities (\( \eta \)) as:

\[ \eta = \frac{dm/m}{dp/p} \]

where \( m \) is the rate of rural–urban migration defined as \( M/L_R \), where \( L_R \) is the rural labor force. \( p \) is the probability of finding a urban job as defined in equation (2) of Blomqvist’s paper.

Because Todaro assumes a job turnover rate of zero, a percent change in the probability of finding urban employment (\( p \)) is simply the percent change in the growth rate of urban employment (\( g \)).

Given Todaro’s definition of elasticity, the change in the urban labor force (\( L_U \), where \( L_U = U + E \)) given a change in the growth rate of urban employment (\( g \)) can be written as
By definition \( \frac{L_R}{L_U} \) and \( m \) are positive, so as long as \( \eta \) is positive, the change in the urban labor force will be positive.

The number of new migrants will exceed the number of new jobs only if the change in the urban labor force is greater than the change in urban employment (remember: \( L_U = U + E \)). Thus, the condition for increases in the level of unemployment given an increase in urban job growth is:

\[
\eta \frac{dg}{g} \cdot m \frac{L_R}{L_U} \cdot L_u - \frac{dg}{g} dE > 0.
\]

This can be simplified as follows:

\[
\eta \cdot \frac{L_R}{L_U} \cdot L_u - dE > 0
\]

\[
\eta \cdot M - gE > 0
\]

\[
\eta \cdot M > g \cdot E
\]

\[
\eta > \frac{gE}{M}
\]

This is the condition used by Todaro (1976) to test whether an increase in urban employment growth leads to an increase in the level of urban unemployment.\(^1\) Todaro then used data from several developing countries to show that this condition holds.

Blomqvist’s criticism of Todaro’s model and empirical test falls into two basic categories: (1) the model only tests short-term impacts of small changes in the rate of job creation and (2) by ignoring the job turnover rate, Todaro biases the analysis in favor of his paradox.

\(^1\) Similarly, \( \eta > \frac{g(E+U)}{M} \) provides a test for whether the rate of urban unemployment will increase.
1. Todaro (1976) only tests short-run impacts of small changes in the job creation rate.²

In all of the countries studied by Todaro, both $\eta$ and $\frac{gE}{M}$ were less than 1. Thus, $M > gE$ and unemployment is rising ($\dot{U} = M - gE$). However, because $\eta$ is also less than 1, an increase in $g$ will cause a proportionally greater increase in $E$ than in $M$ ($\eta \cdot \frac{dm}{m} = \frac{dg}{g}$ from the definition of $\eta$). As $E$ increases faster than $M$, given a large enough change in $g$, $E$ will increase to the point that $gE$ equals $M$, where the change in unemployment equals zero. Thus, large changes in $g$ may not lead to an increase in unemployment as predicted by Todaro.

2. Todaro ignores turnover in the labor market, and concentrates solely on job growth.

Allowing for job turnover, $p$ no longer equals $\frac{gE}{U}$ as defined by Todaro, but rather $(g + b)(E/U)$. To move from Todaro’s definition of $p$ to Blomqvist’s definition of $p$, it is multiplied by $(b + g) / g$.

\[
\eta = \frac{\frac{dm}{m}}{\frac{dP}{P} \left( \frac{b + g}{g} \right)}
\]

\[
\eta \left( \frac{g}{b + g} \right) = \frac{\frac{dm}{m}}{\frac{dP}{P}}
\]

Substituting this new measure of elasticity into Todaro’s condition for increases in employment growth to lead to an increase in the employment level yields the following:

² It should be noted that Todaro concentrates on the rates of changes of these variables, and thus the short-term impacts. As stated above $\eta$ is elasticity of the rural–urban migration with respect to urban employment probabilities, or the change in migration given a change in employment. Assuming, as Todaro does, that $b = 0$, then this can be written as $\frac{dm/m}{g/dg}$, $\frac{dM/M}{g/dg} > g(E)/M$. $\frac{dM/dg}{dE/dg} = E$. $\frac{dM/dg}{d(gE)/dg}$. Using the identity, $\dot{U} = M - gE$, we find that Todaro’s condition is equivalent to $\frac{g}{d\dot{U}} > 0$. 

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\[ \eta \left( \frac{g}{b + g} \right) \frac{dg}{g} \cdot m \frac{Lr}{Lu} \cdot Lu - \frac{dg}{g} dE > 0 \]

\[ \eta \left( \frac{g}{b + g} \right) \cdot M - gE > 0 \]

\[ \eta \left( \frac{g}{b + g} \right) > \frac{gE}{M} \]

Because \( \eta \left( \frac{g}{b + g} \right) < \eta \), allowing \( b \) to be greater than zero only exacerbates the problem criticized above in section 1b—\( gE \) will increase faster than \( M \) until \( gE \) equals \( M \), and the change in the level of unemployment equals zero.

3. Todaro’s migration elasticities (\( \eta \)) are likely biased downwards due to specification error.

In addition to the underestimation of \( \eta \) by the factor \( \left( \frac{g}{b + g} \right) \), Blomqvist’s model suggests that Todaro’s empirical estimates fail to consider an explanatory variable and thus create a downward bias in Todaro’s calculation of elasticities.

Recall equation 7 in Blomqvist’s paper:

\[ \frac{M}{E} = \lambda (\alpha (g + b) - \frac{U}{E}) \]

Substituting \( p = (g + b) \frac{E}{U} \),

\[ \frac{M}{E} = \lambda (\alpha (p \frac{E}{E} - \frac{U}{E}) \]

\[ M = \lambda (\alpha (pU) - U) \]

\[ M = U\lambda (\alpha p - 1) \quad (17) \]

The elasticity \( \eta \) can then be calculated as
\[ \eta = \frac{dM \cdot p}{dp \cdot M} \]

By taking the derivative of equation 17, we calculate \( \frac{dM}{dp} = U\lambda \alpha \). Recall also that \( p = \frac{(g + b)^E}{U} \). After substitution, we have the following equation for \( \eta \):

\[ \eta = U\lambda \alpha \cdot \frac{(g+b)^E}{M} \]

\[ \eta = \frac{(g+b)^E}{M} \cdot \lambda \alpha \quad (18) \]

Substituting for \( M \) and using Blomqvist’s definition of \( p \), we find:

\[ \eta = \frac{(g+b)^E}{U\lambda(\alpha p - 1)} \cdot \lambda \alpha = \frac{(g+b)^E}{U} \cdot \alpha \cdot \frac{1}{\alpha p - 1} \]

\[ \eta = \frac{\alpha p}{\alpha p - 1} \quad (18) \]

Note that \( \eta > 1 \) whenever \( M > 0 \) or \( \alpha p > 1 \). Todaro included \( p \) but not \( U \) as an explanatory variable. Because \( U \) and \( p \) are negatively correlated, and, by equation 17, the partial effect of \( U \) on \( M \) is positive, failure to include \( U \) would tend to underestimate \( p \). Blomqvist suggests this may help account for Todaro’s low elasticity estimates. As a result, Blomqvist doubts the usefulness of considering the Todaro paradox in either the short- or long-run based on empirical estimates at that time.

### B. Implications for the HT Model’s Employment Subsidies Argument

Blomqvist next considers the HT model and its conclusion that an employment subsidy can be welfare improving. He first notes two key differences: 1) The HT model utilized comparative statics, considering only cases where the unemployment rate has reached equilibrium and varying \( E \) (but still setting \( \dot{E} = gE = 0 \)), and 2) The HT model assumed \( b \) goes to infinity. This second difference can be restated to be simply that everyone has an equal probability of gaining employment, meaning that the probability of the unemployed finding a job
in a given period goes to 1 and the expected duration of unemployment goes to 0. As such, the following formula calculates expected earnings for urban workers:

\[
\frac{E}{(E + U)}
\]

Further, by assuming \( b \) goes to infinity, the variance of earnings goes to zero. Blomqvist therefore agrees that, under these assumptions, the HT equilibrium of \( M = 0 \) when \( w_a = \frac{E}{w_m (E + U)} \) makes sense.

Blomqvist next considers the assumptions underlying the HT model and highlights the implications of relaxing these assumptions.

1. **Assumption: Labor in agriculture exhibit diminishing returns.**

In arguing that an employment subsidy is welfare improving, the HT model assumes diminishing returns to labor in agriculture. Because of these diminishing returns, any transfer of labor from agriculture to manufacturing will raise the marginal product of labor for agriculture, which in turn will increase wages in agriculture to reduce the rural-urban wage differential. The reduction in the rural-urban wage differential then leads to a reduction in urban unemployment, and real incomes rise.

Blomqvist counters, however, by considering the effect on real income of adding an additional urban job without this key assumption. At a given marginal product of labor for agriculture of \( w_a \), the loss in agricultural output is \( w_a \frac{(E+U)}{E} \) while the gain in manufacturing output —reflecting the marginal product of labor in manufacturing—is \( w_m \). Since \( w_a = \frac{E}{w_m (E + U)} \), the net gain in real income is zero, indicating that the proper shadow price for urban labor is \( w_m \) and the optimal subsidy for such labor is zero.
2. **Assumption: Turnover rate $b$ goes to infinity.**

Still considering it as a comparative static problem, Blomqvist then relaxes the assumption of an infinite turnover rate. He notes that, although the expected income for an urban worker remains $w_m \frac{E}{(E+U)}$, relaxing this turnover rate assumption results in the variance of earnings no longer being zero and the expected duration of unemployment is now greater than zero. This second condition can be restated as the probability of a newly arrived immigrant finding a job in the first period is less than one. With these conditions, we would now expect that migration will go to zero at a value where $w_a < w_m \frac{E}{(E+U)}$ due simply to the greater uncertainty of income and employment.

3. **Assumption: No divergences exist between private and social opportunity costs.**

Blomqvist notes that, if you assume there are no divergences between private and social opportunity costs other than in the market for urban labor, increasing the number of urban jobs should increase real income. Therefore, the shadow price of labor should be below the market wage and an employment subsidy could be welfare-improving, even without assuming diminishing returns to agricultural labor. However, the condition whereby the shadow price of labor is below the market wage will not strictly hold in the presence of divergences (e.g., $w_a$ does not equal marginal product of labor in agriculture). Blomqvist highlights that empirical evidence suggests that, for most least-developed countries, $w_a$ is likely substantially less than $w_m \frac{E}{(E+U)}$, so market divergences would have to be great indeed to reverse this shadow price condition.

4. **Assumption: Migration responds immediately to employment opportunities.**

Blomqvist then briefly considers the problem outside the comparative statics framework and imagines that migration responds only gradually to employment opportunities and $\dot{E} = gE > 0$. Now, the rate at which agricultural output is foregone due to migration of labor
from rural to urban depends not only on the level of manufacturing employment, but also the rate of job creation $g$ and the turnover rate $b$: The number of hirings is now the key factor.

Blomqvist highlights that there may be no need for a tax-subsidy policy, since it is possible that a “positive urban-rural wage differential” and a positive unemployment rate might be economically efficient. Blomqvist acknowledges that, under certain circumstances where urban wages are frequently greater than the competitive labor rate, all else being equal, an employment subsidy aimed at raising the level of manufacturing employment may be helpful. However, returning to our gradual migration response hypothetical above, if unemployment level depends on $g$ and $b$, a second-best tax subsidy scheme should target hiring rates as well as employment levels.

Blomqvist largely ends his inquiry here, noting the need for a dynamic optimization model to fully address the optimal rate of urban job creation. However, he makes one final comment about a theoretically optimal tax-subsidy solution that could be constructed in line with HT and a “once-and-for-all tax” on hiring labor. The once-and-for-all tax would be based on the present value of foregone agricultural output due to labor migration levels exceeding job creation levels and would depend on the speed with which unemployment level returns to equilibrium once hiring had stopped. Blomqvist anticipates counterarguments that the scheme would be unnecessarily complicated and that a lower employment subsidy would be simpler to administer and perhaps congruent in effect. Blomqvist argues that the advantage of this once-and-for-all tax is that it provides an incentive for firms to reduce turnover and replacement hiring. However, a key problem with this is that such a tax may actually exacerbate unemployment problems by discouraging any hiring in the first place. Firms cannot fully control employee turnover and, recognizing this, may instead view the tax as an incentive to underhire, particularly in cyclical businesses. Further, this may discourage the hiring of inexperienced, younger workers as the firm is uncertain of their abilities at the outset.