# Urban Unemployment in a Monetary Economy

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## 1. Introduction

Since the appearance of the path breaking work by Harris and Todaro (1970), intersectoral migration and urban unemployment have been a popular research theme among international trade theorists. It is an intuitively appealing feature of the following hypothesis that have attracted a handful of researchers to incorporate the H-T model into the standard two-sector analysis. Labor migrates from the rural area to the urban area as long as the expected wage rate in the urban sector which is the exogenously fixed minimum wage multiplied by an employment rate, is higher than the full employment wage rate in the rural sector. The original analysis by Harris and Todaro have been extended into various directions for the last two decades. Bhagwati and Srinivasan (1974, 1975) refined the original H-T model while Corden and Findlay (1975), Kahn (1980), and McCool (1982) have brought the H-T model closer to the traditional Hecksher-Ohlin-Samuelson model by introducing mobile capital into the economy. In the context of the mobile capital H-T model, Neary (1981, 1988) and Funatsu (1988) have studied the stability of the migration. Furthermore, Batra and Naqvi (1987) analyzed the welfare aspects of alternative commercial policies for the mobile capital H-T economy.

The purpose of this paper is to extend the H-T model into the previously unexplored direction by analyzing the effects of monetary disturbances on urban unemployment. In order to do so, we consider a very simple monetary economy. The approach adopted here is due to Hahn (1959), Kemp (1962), and Anderson and Takayama

(1977) which are sometimes referred to as neoclassical approach. In this approach, money serves as the store of value. Namely, consumers hold money for future purchase of goods. Assuming away the presence of interest bearing assets, we have the simplest monetary economy. By fully utilizing the structural simplicity of the model, this paper addresses several interesting questions which have not been studied in the context of the H-T model. Is expansionary monetary policy a remedy for reducing urban unemployment? Does devaluation of money have any effects on the intersectoral labor migration? These questions are important since some developing countries often experience both uncontrollable inflation and massive amount of unemployment at the same time.

In order to make the analysis tractable, we do not hide two crucial simplifying assumptions. One is that the commodity produced in the urban sector is tradable and its price is exogenously given in the world market while the commodity produced in the rural sector is non-tradable and its price is endogenously determined in the domestic market. This assumption is made in order for monetary effects on price to be minimal. The other is that capital is immobile between two sectors. This assumption is made because monetary policy is mainly addressed in the short run period. A consideration of the long run effects of a monetary policy also complicates the analysis without providing significant gains.[1)]

The introduction of money gives us a framework to specify the balance of payment and exchange rate dynamics under the fixed and flexible exchange rate systems. Under the fixed exchange rate system, the effects of a monetary expansion are in most part normal. A rise in the price of the nontraded good and a fall of unemployment are expected. During the period of adjustment, however, a steady fall of the price level is consistent with a gradual increase in employment.

1) Some results of the long run concern will be provided in section 5.

Under the flexible exchange rate system, a monetary expansion temporarily improves unemployment. This temporary effect, however, may be reversed once workers begin to migrate from the lower paid sector to the higher paid sector, giving rise of the possibility that a monetry expansion worsens unemployment problem.

## 2. The Model

We consider an economy with two sectors, a traded good sector and a nontraded good sector. We assume that the country is small in a sense that she is a price taker in the world market. Consumers demand the commodities in order to fill their present needs and demand money for the purpose of future transactions. The nominal wage rate in the traded good sector is fixed institutionally at a higher level than that in the nontraded good sector. Thus a pool of sector specific unemployment exists in the traded good sector, whereas full employment prevails in the nontraded good sector.

### 2-1 Supply Side

Production is carried out according to the following production function,

(2.1) $X_i=f_i(L_i),\ i=T,\ N,$

where $X_i$ is the level of output for the ith sector and $L_i$ the level of labor input. The production function is assumed to be twice continuously differentiable and have derivatives with the following signs: $f_i'>0,\ f_i''<0$.

Producers in each sector are price takers and maximize their profits regarding the prices as given. The first order condition is written as

(2.2) $w_i=P_i f_i'(L_i),\ i=T,\ N,$

where $w_i$ is the nominal wage rate in the ith sector and $P_i$ the price of good i.

From (2.2), the demand for labor in the traded good sector is obtained as[2)]

(2.3) $L_T=\tilde{L}_T(P_T)$.

Let $L_U$ denote the number of unemployed workers. We have

(2.4) $L_T+L_N+L_U=L$,

where $L$ is the given level of labor endowment.

In view of equations (2.1) through (2.3), we get

(2.5) $X_T=f_T(\tilde{L}_T(P_T))\equiv\tilde{f}_T(P_T)$, $\tilde{f}'_T=-\dfrac{f'_T}{f''_T}>0$.

## 2-2 Demand Side

Let us denote the consumers' demand for the goods and money by $D_T$, $D_N$ and $M$. The budget constraint becomes

(2.6) $P_TD_T+P_ND_N+M=Y+\overline{M}$

where $Y$ is the nominal income, and $\overline{M}$ is the intial cash holdings. Demand functions for good $i$ and money are given by

(2.7) $D_i=\tilde{D}_i\ (P_T,\ P_N,\ Y,\ \overline{M})$, $i=T,\ N$,

(2.8) $M=\tilde{M}\ (P_T,\ P_N,\ Y,\ \overline{M})$,

where $\tilde{D}_i(.)$ is homogeneous of degree zero with respect to $P_T$, $P_N$, $Y$, and $\overline{M}$, and $\tilde{M}$ (.) is homogeneous of degree one with respect to the same variables. Thus as far as the cash balance is concerned, what matters is the real cash balance. Therefore our formulation is consistent with traditional neoclassical monetary models.

The current income is defined by $Y=P_TX_T+P_NX_N$. In view of equations (2.1) and (2.5), it becomes

(2.9) $Y=P_T\tilde{f}_T(P_T)+P_Nf_N\ (L_N)$

$=y\ (P_T,\ P_N,\ L_N)$.

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2) $\overline{w}_T$ is eliminated from the right hand side of the equation since it is assumed to be institutionally fixed throughout the present paper. A partital derivative of this function is obtained as

(F.1) $\dfrac{\partial\tilde{L}_T}{\partial p_T}=-\dfrac{f'_T}{f''_T}>0$.

Substituting (2.9) into (2.7) and (2.8), we obtain[3]

(2.10) $D_i=h_i\ (P_T,\ P_N,\ L_N,\ \overline{M}),\ i=T,\ N,$

(2.11) $M=h_M\ (P_T,\ P_N,\ L_N,\ \overline{M}).$

We assume that all goods and money are mutually gross substitute, that is,

(2.12) $$\frac{\partial h_i}{\partial P_j}\begin{cases}>0 & \text{if } i\neq j\\ <0 & \text{if } i=j\end{cases}$$

for $i,\ j=T,\ N$ and

(2.13) $$\frac{\partial h_M}{\partial P_j}>0 \text{ for } j=T,\ N.$$

## 2-3 The Equilibrium

A distinctive feature of the Harris-Todaro specification appears in the labor market. The migration of labor occurs according to the expected wage rate differentials. Since no unemployment exists in the nontraded good sector, its expected wage rate is $w_N$, whereas in the traded good sector it is $\overline{w}_T$ times the probability of obtaining a job. In equilibrium we must have

(2.14) $\beta\overline{w}_T=w_N,$

where $\beta\equiv\dfrac{L_T}{L-L_N}$ is the probability of finding a job. In view of (2.3), it is expressed as a function of two variables, that is

(2.15) $\beta=\tilde{\beta}\ (P_T,\ L_N).$

Let $e$ denote the exchange rate, that is the price of the foreign currency in terms of the home currency.

Then we have

(2.16) $P_T=eP_T^*,$

where $P_T^*$ is the given level of the traded good price in the world market. From the small country assumption, we can choose $P_T^*=1$ without

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3) Note that

(F.2) $$\frac{\partial h_i}{\partial L_N}=c_i p_N f_N'>0 \text{ for } i=T,\ N,\ M,$$

where $c_i$ is marginal propensity to consume good $i$ $(i=T,\ N)$, and $c_M$ the marginal propensity to hold money.

any loss of generality. Thus $P_T=e$ holds throughout. Using (2.2) and (2.15), equilibrium condition (2.14) can be rewritten as

(2.17) $\tilde{B}\ (e,\ L_N)\ \bar{w}_T=P_N f'_N\ (L_N)$.

The nontraded good market is in equibrium when its demand equals supply, that is,

(2.18) $h_N\ (e,\ P_N,\ L_N,\ \bar{M})\ =f_N\ (L_N)$.

For money market, the requirement for an equilibrium is

(2.19) $h_M\ (e,\ P_N,\ L_N,\ \bar{M})\ =\bar{M}$.

The trade balance in our economy is defined as the excess supply of the traded good. Thus we have

(2.20) $B=e\ \{f\ (e)\ -h_T\ (e,\ P_N,\ L_N,\ \bar{M})\}$ .

Under the fixed exchange rate system, $B=0$ is reached at the final equilibrium through the specie flow mechanism. Under the flexible exchange rate system, $B=0$ is attained through the adjustment of the exchange rate. In the final equilibrium, we must have (2.17 ) through (2.20) with $B=0$ all satisfied.

Notice that the budget constraint together with the definition of income provides us with

(2.21) $P_T\ (D_T-X_T)\ +P_N\ (D_N-X_N)\ +\ (M-\bar{M})\ =0$.

Thus one of equilibrium conditions (2.18), (2.19), and (2.20) with $B=0$ is not independent. Thus our equilibrium system consists of three independent equations to determine the values of three variables. Under the fixed exchange rate system, $e$ is given and the trade balance is adjusted through the specie flow mechanism. Thus $\bar{M}$ is endogenous along with $P_N$ and $L_N$.[4] Under the flexible exchange rate system, variables $e$, $P_N$, and $L_N$ are determined. For each case, we have three independent epuilibrium conditions to determine three variables.

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4) If we are interested in the temporary equilibirum where the specie flow mechanism has not yet worked its way through the economy, we have $B$ as a variable for given $\bar{M}$.

It must be noted, however, the full equilibrium described by the three independent equations is the final equilibrium where all the adjustments are completed. In the process of adjustments, there is no guarantee that all the equilibrium conditions are satisfied. In order to identify which conditions are satisfied, we need additional assumptions on the adjustment of each market, which will be provided in the following sections.

## 3. Fixed Exchange Rate System

In this section we first consider the case in which a change in the balance of payment does not affect a nation's money stock but not vice versa. Namely, we analyze a temporary equilibrium where the money stock is treated as an exogenous variable. The price of the nontraded good is assumed to respond to excess demand in the nontraded good market in the usual Walrasian manner, that is

(3.1) $\dot{P}_N = \alpha_1 \{h_N(e, P_N, L_N, \bar{M}) - f_N(L_N)\}$,

where $\alpha_1$ is the speed of adjustment.

In the labor market, if the fully flexible nominal wage rate in the nontraded good sector is higher than the expected nominal wage rate in the traded good sector, workers migrate from the traded good sector to the nontraded good sector. The movement continues until the two rates are equal to each other. Thus we have

(3.2) $\dot{L}_N = \alpha_2 \{P_N f_N'(L_N) - \tilde{\beta}(e, L_N)\bar{W}_T\}$.

First, we concentrate our attention on a temporary equilibrium under the fixed exchange rate system. Thus money supply and the exchange rate are exogenous in (3.1) and (3.2). Therefore $P_N$ and $L_N$ are endogenously determined when $\dot{P}_N=0$ and $\dot{L}_N=0$ are attained at the temporary equilibrium. We can examine the stability of the system,[5]

5) Let $J_i$ be the Jacobian matrix. We have

(F. 3) $tr\ J_1 = \alpha_1 \frac{\partial h_N}{\partial p_N} + \alpha_2 \left(p_N f_N'' - \frac{\beta \bar{w}_T}{L - L_N}\right) < 0$,

(F. 4) $\det J_1 = \alpha_1 \alpha_2 \left\{(1 - p_N c_N)(f_N')^2 - \frac{\partial h_N}{\partial p_N}\left(p_N f_N'' - \frac{\beta \bar{w}_T}{L - L_N}\right)\right\} > 0$.

and conduct a comparative static analysis of a monetary expansion.

Let $|J_1|$ denote the inside of the bracket in (F. 4). Since $|J_1|>0$, we have the following results.

$$(3.3)\quad \frac{dp_N}{d\bar{M}}=-\frac{c_N}{|J_1|}\left(p_N f''_N-\frac{\beta\bar{w}_T}{L-L_N}\right)>0,$$

$$(3.4)\quad \frac{dL_N}{d\bar{M}}=\frac{c_N f'_N}{|J_1|}>0.$$

We know from (2.3) that $L_T$ is determined solely by exogenous variables and hence it is constant. Thus we get

$$(3.5)\quad \frac{dL_U}{d\bar{M}}=-\frac{dL_N}{d\bar{M}}<0.$$

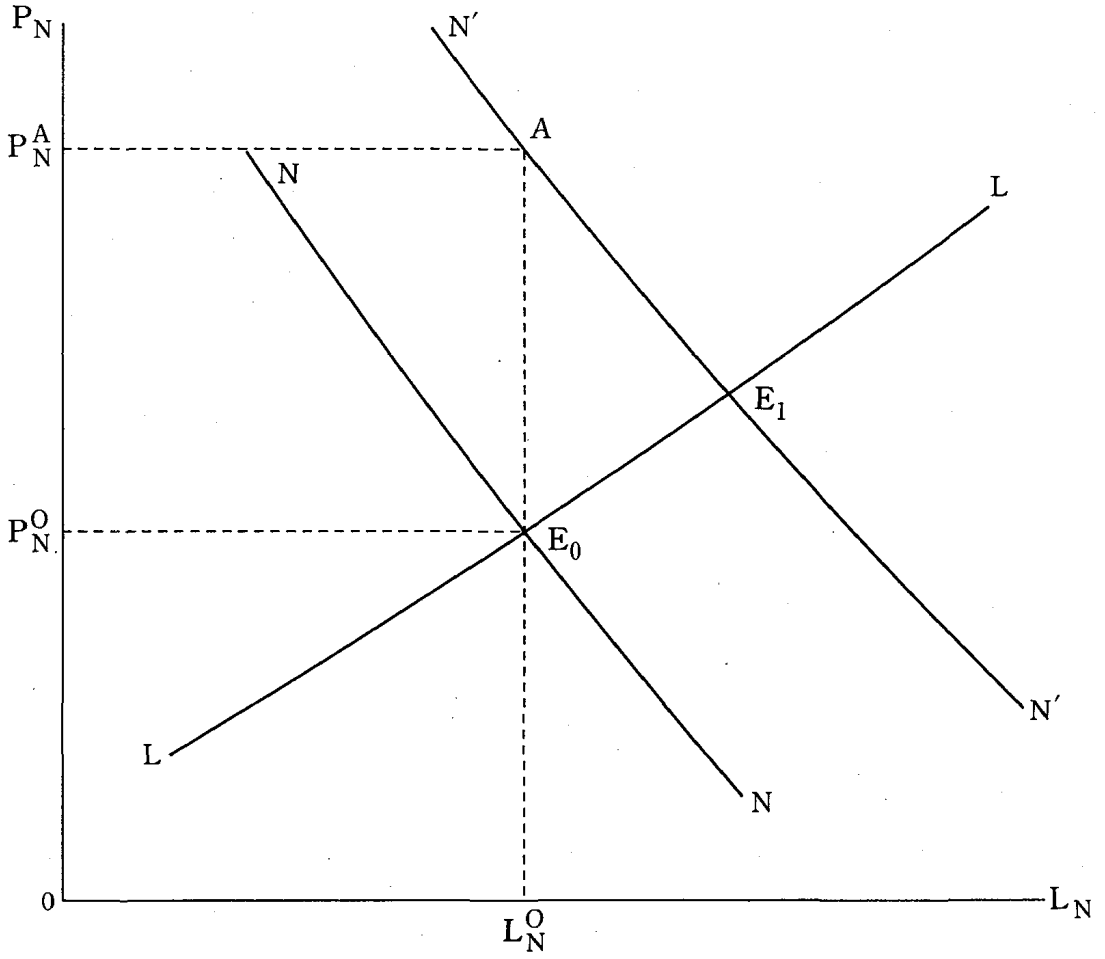


Figure 1

The effect on the trade balance is given by

$$(3.6)\quad \frac{d\beta}{d\bar{M}} = -e\left[\frac{\partial h_T}{\partial p_N}\frac{dp_N}{d\bar{M}} + \frac{\partial h_T}{\partial L_N}\frac{dL_N}{d\bar{M}} + c_T\right] < 0.$$

The results can be explained by using Figure 1, where $NN$ shows the market equilibrium for the nontraded good market and $LL$ shows the labor market equilibrium. A monetary expansion shifts the $NN$ line to $N'N'$, creating an excess demand in the nontraded good market at the initial price level. Thus $P_N$ is pushed upward. As $P_N$ begins to rise, $w_N$ becomes larger causing a migration of workers from the traded good sector to the nontraded good sector. Since $L_T$ is constant in the short run, the additional demand for labor in the nontraded good sector is filled by the workers from the unemployment pool. As $P_N$ and $L_N$ are increased, the demand for the traded good is also increased, whereas its supply is constant. Therefore the balance of trade turns into deficit.

It is important to notice that the direction of changes in $P_N$ and $L_N$ at a particular moment depends on specific assumptions on the speeds of adjustment. For example, if we assume that $P_N$ adjusts faster than $L_N$, which is often observed in the real world, then the initial movement following the monetary expansion is a jump of the price level from $p_N^O$ to $p_N^A$ in Figure 1. Then a gradual increase in $L_N$ accompanied with a continuous fall in the price of the nontraded good may be observed. In other words, a steady fall in the price level is consistent with an expansion of employment during this period. We can summarize the results as follows.

**Proposition 1**

Under the fixed exchange rate system, a monetary expansion causes an increase in the price of the nontraded good, a reduction in the level of

unemloyment, and a balance of trade deficit. A steady fall of the price level and an expansion of employment may coexist during the period of adjustment towards the temporary equilibrium.

In the foregoing analysis, we assumed that the period we are concerned with is short enough so that the balance of payment deficit did not alter the level of money stock. Suppose the well known specie flow mechanism begins to work its way into the economy. Then the balance of trade deficit begins to drain the nation's money stock. This continues until it comletely wipes out the initial money expansion. In other words when the specie flow mechanism completes its adjustment, we are back to the original equilibrium as if nothing had happened. In this sense, money is neutral under the fixed exchange rate system.

**Proposition 2**

Money is neutral under the fixed exchange rate system in the sense that if the specie flow mechanism works freely and completes its adjustment, the economy is back at the original equilibrium.

## 4. Flexible Exchange Rate System

Under the flexible exchange rate system, the exchange rate must be determined endogenously. It requires a formulation of the dynamic process which explains the exchange rate behavior. To do so in our model, we must take into account of two major forces that are responsible for exchange rate fluctuations. One is the force due to the money market disequilibrium, and the other due to the balance of trade.[6] Suppose the economy experiences an increase in the money supply. The larger money stock tends to drive domestic prices up including the domestic price of the traded good. This upward pressure

6) No interest bearing financial asset is considered in our model. Hence the effect from asset markets are not considered here.

is translated into the upward pressure on the exchange rate. This aspect of exchange rate dynamics is emphasized by the monetary approach to the balance of payments. The second force is due to the imbalance of trade, which is given by the value of excess supply of the traded good. A deficit tends to drive the exchange rate upward. The actual dynamics of the exchange rate are subjected to both of these forces. Therefore we have

$$(4.1) \qquad \dot{e} = \alpha_4 \ (\overline{M} - M) \ + \alpha_5 e \ (D_T - X_T).$$

By Walras law (2.22), if $D_N = X_N$ holds, $\overline{M} - M = e \ (D_T - X_T)$ holds as well. Therefore, if the nontraded good market is in equilibrium, it does not make any difference if we use trade balance or excess money demand to describe exchage rate dynamics. However, if we want to exchange rate dynamics under the period of disequilibirum in the nontraded good market, we must consider two forces that affect exchange rate. For, these two forces tend to act against each other as shown below.

The price of the nontraded good is subjected to Walrasian forces given by (3.1 ) in the previous section. Similarly the labor migration is described by (3.2 ). Hence three equations (3.1 ), (3.2 ), and (4.1 ), describe our dynamic system under the flexible exchange rate system. We assume here that the exchange rate and the price of the nontraded good adjust their values considerably quickly to attain a temporary equilibrium. The equilibrium is temporary because the migration of workers from one sector to the other is forthcoming to complete the short run adjustment. Mathematically speaking, we consider (3.1) and (4.1) with variables $P_N$ and $e$ under constant $L_N$ to reach the temporary equilibrium.

An equilibrium is shown at $A$ in Figure 2. Lines $NN$, $TT$, and $MM$ represent the equilibrium conditions of the nontraded good market, the traded good (the balance of trade) market, and the money market.

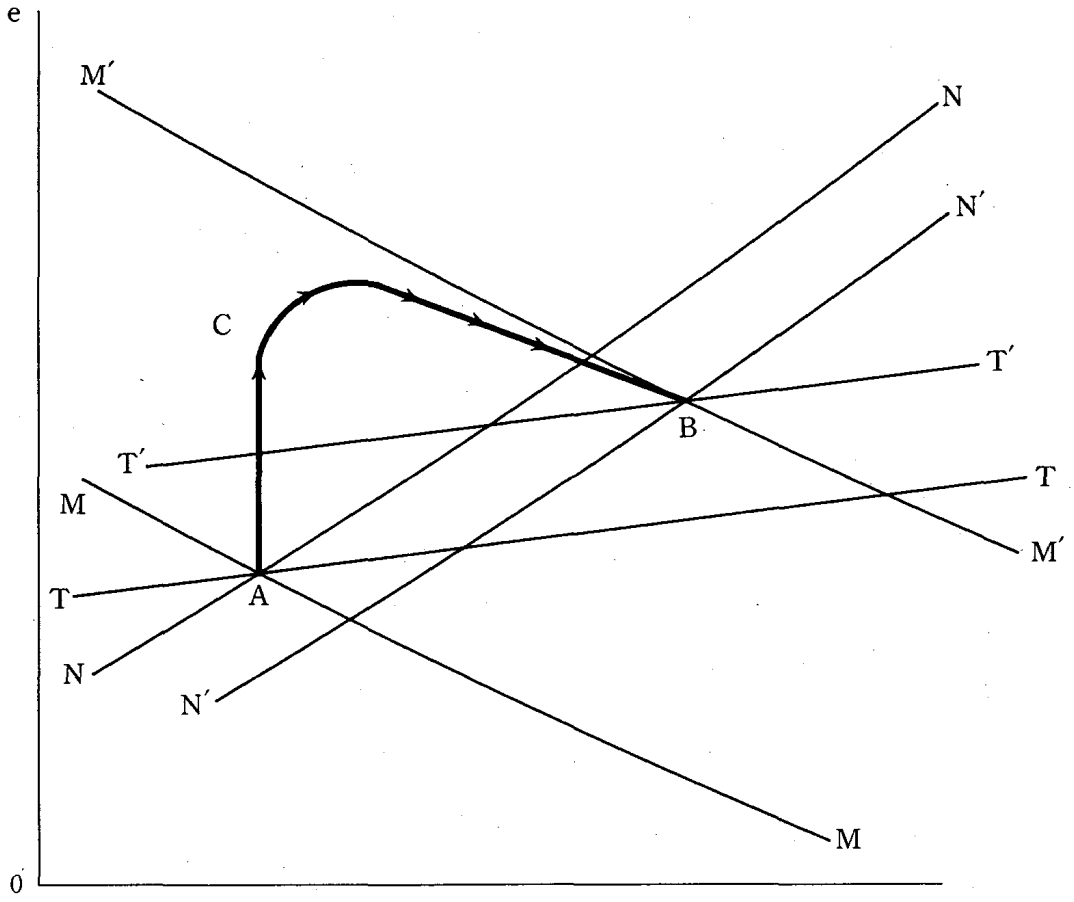


Figure 2

The area below line $MM$ corresponds to an excess money supply and below line $TT$ shows excess demand for the traded good (the balance of trade deficit). Now suppose the money supply is increased, $MM$ shifts upward to $M'M'$, $NN$ to $N'N'$, and $TT$ to $T''T''$, forming a new temporary equilibrium at B. Thus the exchange rate rises and $P_N$ rises. Mathematically the results are confirmed as

$$(4.2)\quad \frac{de}{d\bar{M}}=\frac{1}{|D_3|}\left[c_N\frac{dh_T}{dp_N}-c_T\frac{\partial h_N}{\partial p_N}\right]>0,$$

$$(4.3)\quad \frac{dp_N}{d\bar{M}}=\frac{1}{|D_3|}\left\{c_N\frac{\partial h_N}{\partial e}-c_N\left[\frac{\partial h_T}{de}-f_T'\frac{\partial \tilde{L}_T}{de}\right]\right\}>0,$$

where $|D_3|=\dfrac{\partial h_N}{\partial p_N}\left[\dfrac{\partial h_T}{de}-f_T'\dfrac{\partial L_T}{\partial e}\right]-\dfrac{\partial h_N}{\partial e}\dfrac{\partial h_T}{\partial p_N}>0.$

A little more interesting results are revealed if we investigate the dynamic path the economy takes to reach the temporary equilibrium at

B. The dynamic path is sensitive to the values of speed of adjustments in (3.1) and (4.1). For example, we may assume that the exchange rate moves faster than the nontraded good price. Following a monetary expansion, the economy experiences a balance of trade deficit and an excess money supply. The exchange rate is devalued quickly to move toward $C$ in Figure 2. Now at $C$, the money market is still in an excess supply, providing upward pressure on the exchange rate. However, the trade balance at $C$ is in surplus, applying a downward pressure on the exchange rate. How the exchange rate behaves depends on the strength of these two conflicting forces. If the money market force is stronger, the exchange rate jumps higher, giving rise for the possibility of the exchange rate overshooting, the phenomenon observed in the recent experience of floating exchange rates. It should be noted that the overshooting is caused by the difference of adjustment speeds in our model, whereas most literature on the subject emphasises asset markets and formulations of expectations.

A monetary expansion reduces the level of unemployment in the temporary equilibrium. This occurs because a rise of the exchange rate induces a rise in the traded good price, stimulating production and hence more workers and hired in the traded good sector. These are summarized as follows.

**Proposition 3**

Under flexible exchange rate system, a monetary expansion causes

(a) an immediate increase in the level of exchange rate (devaluation).

(b) an exchange rate overshooting if the force of the money market is considerably stronger than that of the balance of trade in determining the rate of exchange. If so, a period of a gradual reduction of exchange rate and an increase in $P_N$ may be observed.

(c) a temporary improvement in the level of unemployment.

Given a sufficient time for adiustment, workers become mobile between the two sectors. A signal is given to workers by the real wage paid and the probability of finding a job in the traded good sector. The movement is already described by (3.2). The only difference here is that variable $e$ is endogenous.

We assume that the dynamic process given above is stable.[7] We can show that the price of the nontraded good and exchange rate continue to be higher than the initial levels when the second stage adjustments are completed. On the other hand, the unemployment situation is not so obvious. We must trace the flow of labor from one sector to the other to find out what happens in the labor market.

We know that a monetary expansion causes both $w_N$ and $\beta\overline{w}_T$ to rise but we cannot determine the magnitude of their increases. Hence the direction of migration cannot be determined. If $w_N$ rises more than $\beta\overline{w}_T$, workers tend to move out of the traded good sector into the nontraded good sector. This infusion of workers into the nontraded good sector causes a fall in the marginal product of labor in that sector and a rise in the probability of finding a job in the traded good sector. This process continues until the two wage rates, allowing the adjustment by the probability, are equal again. For this case, we are sure to say that the level of unemployment is reduced when all adjustments are completed.

On the other hand, if the initial monetary expansion brings a higher rate of increase in $\beta\overline{w}_T$ than in $w_N$ workers move from the nontraded good sector to the traded good sector. For this case, the level of unemployment may be raised when the short run adjustments

7) A sufficient condition for stabillility is

$$c_T p_N \frac{\partial h_N}{\partial p_N} + (1 - c_N p_N) \frac{\partial h_T}{\partial p_N} > 0.$$

come to an end. This perverse result occurs if the number of workers from the nontraded good sector is larger than the number of additional workers hired in the traded good sector.

The following example is helpful to understand the situation. Suppose that the economy is in equilibrium initially with the nominal wage rate of \$4 in the nontraded good sector and \$5 in the traded good sector (e.g., $w_N=4$, and $\overline{w}_T=5$). Suppose further that 10 million of a total labor force of 20 million are employed in the nontraded good sector and 8 million are employed in the traded good sector. Thus we have $L_N=10$, $L_T=8$, $L_U=2$, and $L=20$. The employment rate $\beta$ in the traded good sector is 0.8. Thus we can see the labor market is in equilibrium by $w_N=4=0.82\times5=\beta\overline{w}_T$. Suppose that a monetary expansion takes place, and that it causes an increase in the nominal wage of the nontraded good sector by 0.05 and an increase of 1.84 million additional jobs in the traded good sector in the temporary equilibrium. We can compute and compare the new effective wage rate in the following way. For the nontraded good sector, $w_N$ becomes 4.05 due to the increase of 0.05. For the traded good sector the new probability of getting a job is computed as $\beta=(8+1.84)/10=0.984$. Thus the adjusted wage rate in the traded sector is 4.92. Clearly this induces a migration of workers from the nontraded good sector to the traded good sector. The migration of the labor causes an increase in the wage rate of the nontraded good sector and a decrease in the probability of finding a job in the nontraded good sector. Suppose that two million workers migrated from the nontraded good sector to the traded good sector. And also suppose that the migration caused an increase in $w_N$ by 0.05. Then we can see that the revised probability of finding a job in the traded good sector is $\beta=9.84/(10+2)=0.82$. At this point, the short run equilibrium is attained since $w_N=4.1=0.82\times5=\beta\overline{w}_T$. The levels of employment in each sector are given by $L_N=8$, $L_T=9.84$, and $L_U=2.16$. Therefore the total

number of unemployment is increased by 0.16. It is interesting to observe here that the rate of unemployment went down from 20% to 18% in the traded good sector even though the number of unemployment went up. Two factors are crucial for this perverse outcome. First, the original increase in the nominal wage rate in the nontraded good sector is small. So that the direction of the migration is from the nontraded good sector to the traded good sector. Second, the marginal product of labor in the nontraded good secor does not increase too much after a reduction in labor force. As a result, a considerably many workers migrate out of the nontraded good sector to join the traded good sector.

Now we have the following

**Proposition 4**

Under the flexible exchange rate system, when all adjustments are completed, a monetary expansion results in

(a) an increase in the price of the nontraded good and in the level of exchange rate,

(b) a possible increase in unemployment. This perverse outcome is consistent with dynamic stability.

## 5. Conclusion

This paper has studied the short run effects of a monetary expansion on urban unemployment in a modified Harris-Todaro model. Utilizing a simple model of monetary economy, we have found that monetary expansion can reduce urban unemployment during the initial adjustment period under both fixed and flexible exchange rate. However, after all adjustments are completed, monetary expansion does not have any effect on urban unemployment under fixed exchange rate and might cause an increase in unemployment under flexible exchange rate. Therefore, expansionary monetary policy is sometimes attractive for

policy makers but it is not effective to reduce sector specific urban unemployment.

Although it has not been formally presented here, results in the mobile capital case should be mentioned. Under the fixed exchange rate, if the capital becomes mobile before the specie flow mechanism works its way through the economy, a monetary expansion may increase unemployment. This perverse result can occur if the nontraded good sector is relatively more capital intensive than the traded good sector.[8] Though we cannot give a clear-cut result under the flexible exchange rate system, the effectiveness of an expansionary monetary policy depends on the supply side conditions such as relative capital intensities. While the effects of once for all monetary expansion fade away through the specie flow mechanism under the fixed exchange rate system, they are permanent under flexible exchange rate system.

Finally, one must remember that our conclusion is based on a number of simplifying assumptions. In order to capture more realistic aspect of monetary economy, we need more elaborations in modeling. The analysis in this paper should be justified only because it is a first attempt to incorporate the monetary element into the Harris-Todaro model.

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8) This result is well known in a two-sector-minimum-wage-economy of the Brecher type.

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