Effects of External Economic Events on a Labor-Exporting Developing Economy

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This paper adopts a theoretical approach and seeks to explore the effects of external economic events on the national output and price level in a labor-exporting developing small open economy within a Keynesian aggregate demand and aggregate supply framework. The comparative statics reveal that devaluation by the labor-exporting developing country, and increases in the host country nominal wage, national income and price level will raise national output and price level in the labor-exporting developing country. But imposition of any restrictions on the outflow of remittances by the labor-importing country will set a stage for recession in a labor-exporting developing economy. As a part of the supply shock, a rise in domestic nominal wage will reduce the national output. But its effect on the domestic price level remains ambiguous.

I. Introduction

The neoclassical paradigm of international factor mobility states that the process of labor migration should benefit both the labor-sending and the labor-receiving countries, or at least make one better off and the other no worse off. The existence of higher wages for labor in one country relative to another is a sign that labor is relatively scarce in the country with the higher wages and relatively abundant in the country with the lower wages. The free movement of labor from the low-wage to the high-wage country would, thus, benefit both the countries.

The labor-exporting country, confronted to intolerably high rate of

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unemployment, would be immediately relieved of the pressure. If it were at full employment, it would experience a drop in GDP but possibly not in GNP as remittances from abroad would compensate for the drop in domestic output caused by the workers' departure. If the workers migrate permanently and do not send back remittances, the labor-exporting country would experience a drop in absolute GNP but not necessarily in per capita GNP.

After the 1973 oil shock, there was a substantial decline in the number of migrant workers in Germany, France, and Great Britain as these countries slid into a recession. At the same time, the oil-exporting Middle Eastern and other African-Asian countries, such as Saudi Arabia, Kuwait, Iran, Iraq, Libya, United Arab Emirates, Bahrain, Abu Dhabi, Qatar, etc., emerged as major importers of labor. They import labor from the neighboring low-income and labor-abundant countries as well as from the labor-surplus less developed countries in Asia and Africa. Egypt, Sudan, Jordan, Yemen, India, Thailand, Pakistan, Bangladesh, Sri Lanka, Philippines, Malaysia, Indonesia, and South Korea are the major exporters of temporary workers to the above oil-exporting countries.

Foreign workers from the neighboring Arab countries comprise almost 70 percent of migrants in the Middle East. Pakistanis and Indians together constitute 23 percent of foreign workers in this region. Migrant workers and their dependents constitute even the majority of the population in Kuwait and the United Arab Emirates. Jordan and Yemen had 28.2 and 20.3 percent of this work force respectively in the oil-exporting Middle Eastern countries in 1975 (Todaro, 1985).

The literature, both theoretical and empirical, dealing with the causes and effects of emigration is highly diverse and controversial (Friedlander (1965), Hume (1973), Stahl (1986), Chandravarkar (1980), Banuri (1986), Bohning (1979), Griffin (1976), Diajic (1986), Rivera-Batiz (1982), etc.). Despite their disagreements on the economic effects of emigration, they all emphasize the importance of workers' remittances in the labor-exporting economy. Very recently, several studies have highlighted the importance and the use of remittances from abroad. The total remittance as a ratio to exports of goods and services in 1989 was: 41 percent for Egypt, 24 percent for Jordan, 37 percent for Pakistan, 50 percent for Sudan, and 37 percent for Yemen. As a percentage of GDP, remittances remained roughly at 5.6 and 5.9 in Pakistan for 1988 and 1989 respectively and relatively high at 17 for Egypt in 1989 (Wahba, 1991).

There are some controversies surrounding the productive utilization of the remittance money. Lipton (1980), for example, maintains that 90 percent of remittance money is absorbed in financing daily consumption needs. Similarly, Chandravarkar (1980) writes that most of the remittance money in Pakistan filters away through personal consumption, social ceremonies, and real estate. Similar expenditure pattern out of remittance money has been reported in many other labor-exporting countries including Bangladesh, Egypt, Yemen, and Turkey (Ali (1981), Amin and Awny (1985), Kaysar (1972) and Swanson (1979)). On the contrary, Adams (1991) contradicts the above findings stating that migrant households in Egypt devote only 12 percent of the remittance increments to additional consumption. This implies a substantial rise in the marginal propensity to save in the Egyptian migrant households.

The scope for the globalization of trade in people is becoming increasingly wider for the years 2000s because the work forces in the developed countries appear to stop growing in the future whereas the third world developing nations are depicting explosions in population growth. Hence, developed countries have to import more workers from these countries in the future in order to sustain the momentum of economic growth (Johnston, 1991).

The primary purpose of this study is to investigate the macroeconomic consequences of external economic events on a small open labor-exporting developing economy within a simple Keynesian aggregate demand and aggregate supply (AD-AS) framework. The remainder of the paper proceeds as follows: the model is outlined, and the solution method is discussed; the comparative statics are derived and the results analyzed. The paper concludes with some remarks.

II. The Model and the Solution Method

The model captures some of the basic features of a labor-exporting developing country. The model formulation is based on a set of assumptions: The country has a small open economy. It is labor-abundant and capital-poor. Capital is a fixed factor of production at least during the limited period under consideration (Neary (1978) and Gylfason and Radetzki (1991)). This permits to disregard investment and also to exclude the possibility that devaluation (a controversial instrument of economic policy, especially in low-income developing countries) may increase labor productivity by stimulating capital accumulation (Risager, 1988). The country's exchange rate is assumed to

be fixed but periodically adjustable. This assumption is reasonable because the less developed countries' currencies, in general, are not convertible in major international currency markets due to lack of liquidity. So, the case of flexible exchange rate is not considered for this study. Devaluation, although a disputed policy tool, is useful to labor-exporting developing countries because it influences real GNP through exports, imports, and consumption expenditures. Labor is the only variable factor of production. The economy experiences nominal wage rigidity due to contract or custom at least at the outset (Bruno and Sachs, 1985). Labor is highly mobile internationally. The economy being studied in this paper, encourages temporary emigration of un-skilled and semi-skilled workers, preferably from the pool of the young and educated unemployed. The migrant workers do not face any wage or job discrimination in the labor-importing country and can freely remit their savings to home countries. The labor-importing country's economy is highly exposed to the world market and hence its domestic price is presumed to be approximated by the world price. The workers are allowed to emigrate without carrying any capital with them out of the home country.

Financial markets are virtually non-existent, in general, in low-income developing countries. Money supply is determined through arbitrary credit programming and the interest rates are repressed institutionally by rigid controls on capital movement. So, considerations of money and financial markets can be suppressed in this study (Bruno and Sachs (1985)).

The model is outlined in general functional forms to overcome arbitrary parametrization as follows:

(1) $Q^s = Q(L);\ Q' > 0,\ Q'' < 0$

(2) $L = L(\dfrac{w}{p});\ L' < 0$

(3) $E = E(\dfrac{ew^*}{w});\ E' > 0$

(4) $R = R(w^*E - \bar{C}^*);\ R' > 0$

(5) $Y = Q^s + R$

(6) $C = C(Y);\ 0 < C' < 1$

(7) $\quad X = X(Y^*, \dfrac{ep^*}{p});\ X_1 > 0,\ X_2 > 0$

(8) $\quad M = M(Y, \dfrac{ep^*}{p});\ M_1 > 0,\ M_2 < 0$

(9) $\quad Q^d = C + X - M$

(10) $\quad Q^s = Q^d = Q$

where

Q^s = total national output (both traded and nontraded outputs lumped together), L = demand for labor, w = nominal wage in the labor-exporting economy, p = general price level in the labor-exporting economy, w^* = nominal wage in the labor-importing country, e = nominal exchange rate, E = number of emigrants, R = remittances from the labor-importing country, $\overline{C}^*$ = emigrant's consumption expenditures on bare necessities in the labor-importing country, Y = national income in the labor-exporting country, C = aggregate consumption expenditure in the labor-exporting coutry, X = the labor-exporting country's merchandise exports, M = merchandise imports of the labor-exporting country, p^* = world price approximating the price level in the host country, Q^d = total quantity of output demand in the labor-exporting country, and Q = equilibrium national output. The respective partial derivatives with respect to the relevant arguments are presented against each equation.

Equation (1) is the neo-classical production function with labor as the only variable input. Marginal productivity of labor is assumed to be positive and subject to the condition of diminishing marginal productivity due to specificity of capital in the short run. Equation (2) specifies aggregate demand for labor in the labor-exporting economy. It originates with the profit maximizing behavior of business firms. The demand for labor is inversely related to the real wage. Equation (3) provides an explanation as to why workers emigrate to foreign countries. This is mainly due to the exchange rate adjusted nominal wage differential between the labor-exporting and the labor-importing countries. Equation (4) is a specification of potential remittances as measured in terms of the savings available to the migrant workers in the labor-importing country. Equation (5) is a national income accounting identity. Equation (6) originates with the utility maximizing behavior of the households. It shows that private consumption is positively related to national income. Equation (7) is the labor-

exporting country's merchandise export supply function. It shows that exports depend positively on both foreign income and terms of trade (real exchange rate). Equation (8) is the labor-exporting country's merchandise import demand function. It shows that imports depend positively on the labor-exporting country's national income and negatively on the terms of trade (real exchange rate). Equation (9) is a specification for the aggregate demand in the labor-exporting trading economy. This is expressed as a sum of private consumption and net exports. Finally, equation (10) represents the overall equilibrium condition in the labor-exporting developing economy.

The model is complete in ten equations with ten endogenous variables. The list of endogenous variables includes Q^s, L, E, R, Y, C, X, M, Q^d, and p. The exogenous variables are e, w, w*, p*, Y*, and C*. Changes in e, w*, p*, Y*, and $\bar{C}$* relate directly to demand shocks while any changes in w may be tagged to a supply shock.

As a part of the solution method, equations (1) and (2) are combined to obtain an expression for the aggregate supply (AS) as follows:

(11) $Q^s = Q(L(\dfrac{w}{p}))$

It can be shown easily that

$$\frac{dQ^s}{dp} = -\frac{1}{p^2} Q'L'w > 0.$$

In other words, the aggregate supply curve is upward-sloping. By a chain of appropriate substitutions of equation (3) through (8) and then substituting in equation (9), the following expression for aggregate demand (AD) is obtained

(12) $Q^d = C\left[Q\left(L(\dfrac{w}{p})\right) + R\left(w*E\left(\dfrac{ew*}{w}\right) - \bar{C}*\right)\right] + X\left(Y*, \dfrac{ep*}{p}\right)$

$\qquad\qquad - M\left[\left(Q\left(L\left(\dfrac{w}{p}\right)\right) + R\left(w*E(\dfrac{ew*}{w}) - \bar{C}*\right)\right), \dfrac{ep*}{p}\right]$

It can be shown further that

$$\frac{dQ^d}{dp} = Q'L'\frac{w}{p^2}(M_1 - C') - \frac{ep*}{p^2}(X_2 - M_2) \lessgtr 0.$$

Determination of the sign of this first order derivative requires some

restrictive assumptions, such as, if $M_1 = C'$ and $X_2 = M_2$, the AD curve will be vertical. Again if $M_1 = C'$, then the AD curve will be downward-sloping.

Equations (11) and (12) are utilized in conjunction with the equilibrium condition from equation (10) in the next section in order to derive the comparative statics.

III. Comparative Statics and the Results

Taking total differentials of equations (11) and (12) with respect to Q and p,

$$\begin{bmatrix} 1 & Q'L'\dfrac{w}{p^2} \\ 1 & \dfrac{ep^*}{p^2}(X_2-M_2) \end{bmatrix} \begin{bmatrix} dQ \\ dp \end{bmatrix} = \begin{bmatrix} B \\ D \end{bmatrix}$$

where B and D are the constant terms. The determinant of the Jacobian (J) of the above system is

$$|J| = \frac{1}{p^2}(ep^*(X_2-M_2)-Q'L'w) > 0$$

A. Effects of Exchange Rate Devaluation by the Labor-Exporting Country on Its National Output and Price Level

On further differentiation with respect to e,

$$[J] \begin{bmatrix} \dfrac{dQ}{de} \\ \dfrac{dP}{de} \end{bmatrix} = \begin{bmatrix} 0 \\ C'R'e'w^* \end{bmatrix}$$

With the aid of Cramer's rule,

$$\frac{dQ}{de} = \frac{-Q'L'\dfrac{w}{p^2}C'R'E'w^*}{|J|} > 0$$

$$\frac{dP}{de} = \frac{C'R'E'w^*}{|J|} > 0$$

The exchange rate devaluation by the labor-exporting country will cause a rise in the exchange rate adjusted relative wage (ew^*/w) which, in turn, will provide incentives for larger emigration of workers. Larger temporary emigration will obviously result in a higher inflow of concomitant remittances, which filtering through daily consumption will cause the aggregate demand curve to shift to the right. Consequently, both national output and price level will rise due to the exchange rate devaluation by the labor-exporting country.

B. Effects of an Increase in Host Country Nominal Wage (W*) on Labor-Exporting Country's National Output and Price Level

Without repeating the detailed mathematical exercises, it can be shown on further differentiation with respect to w^* that

$$\frac{dQ}{dw^*} > 0 \quad \text{and} \quad \frac{dp}{dw^*} > 0.$$

In other words, an increase in the nominal wage in the labor-importing country will have similar effects on national output and price level for the same reasons as cited in the preceding sub-section.

C. Effects of an Increase in p* on Output and Price in the Labor-Exporting Country

On further differentiation with respect to p^*,

$$[J] \begin{bmatrix} \dfrac{dQ}{dp^*} \\[2ex] \dfrac{dP}{dp^*} \end{bmatrix} = \begin{bmatrix} 0 \\[2ex] \dfrac{e}{p}(X_2 - M_2) \end{bmatrix}$$

Again, by Cramer's rule,

$$\frac{dQ}{dp^*} = \frac{-Q'L'\dfrac{w}{p^2}\dfrac{e}{p}(X_2 - M_2)}{|J|} > 0$$

and

$$\frac{dp}{dp^*} = \frac{\dfrac{e}{p}(X_2 - M_2)}{|J|} > 0$$

A rise in p^*, ceteris paribus, will provide incentives for higher exports. Since the labor-exporting country as a small open economy faces infinitely elastic world demand for its products, it can export as much as it wants at the new price. Thus, an increase in exports will cause the aggregate supply of output to rise.

The increase in p^* at the pre-fixed nominal exchange rate will make imports more expensive than before. Hence consumers in the labor-exporting country will partially switch their consumption from foreign goods to domestic goods leading to the creation of an excess demand for the domestic goods. As a result, the domestic price in the labor-exporting country will increase.

D. Effects of a Rise in Host Country National Income (Y*) on Output and Price in the Labor-Exporting Country

On further differentiation with respect to Y^*,

$$[J]\begin{bmatrix} \dfrac{dQ}{dY^*} \\ \dfrac{dp}{dY^*} \end{bmatrix} = \begin{bmatrix} 0 \\ X_1 \end{bmatrix}$$

Using Cramer's rule,

$$\frac{dQ}{dY^*} = -\frac{1}{p^2}\frac{(Q'L'wX_1)}{|J|} > 0 \quad \text{and}$$

$$\frac{dp}{dY^*} = \frac{X_1}{|J|} > 0$$

An increase in national income in the labor-importing country, ceteris paribus, will raise the demand for foreign workers. As a result, more workers will be able to emigrate to these countries and the inflow of concomitant remittances will record a further increase. The larger remittances will cause the aggregate demand curve in the labor-exporting country to shift to the right due to filtering of higher remit-

tances through daily consumption. As a consequence, both output and price will rise in the labor-exporting country.

E. Effects of Restrictions on Outflow of Remittances by the Host Country on Output and Price in the Labor-Exporting Country

Any restrictions imposed on remittance outflow by the labor-importing country will be reflected through a rise in migrant workers' consumption expenditures ($\bar{C}^*$) in that country. On further differentiation with respect to $\bar{C}^*$,

$$[J] \begin{bmatrix} \dfrac{dQ}{d\bar{C}^*} \\[2ex] \dfrac{dp}{d\bar{C}^*} \end{bmatrix} = \begin{bmatrix} 0 \\[2ex] -C'R' \end{bmatrix}$$

Again, with the aid of Cramer's rule,

$$\frac{dQ}{d\bar{C}^*} = \frac{1}{p^2}\frac{(Q'L'wC'R')}{|J|} < 0 \text{ and}$$

$$\frac{dP}{d\bar{C}^*} = \frac{-C'R'}{|J|} < 0$$

A decline in remittances would reduce consumption in the labor-exporting country following the restrictions, imposed by the labor-importing country. As a result, the aggregate demand curve will shift to the left causing both output and price to slide. This, in turn, will set a stage for recession in the labor-exporting economy. All the above can be summarized in terms of the following diagram:
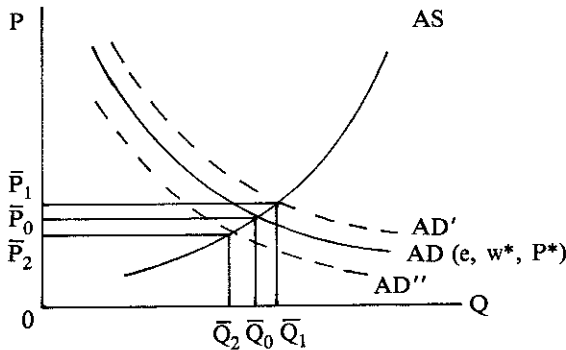
The initial equilibrium levels of output and price are shown at $\bar{Q}_0$ and $\bar{P}_0$ respectively, as drawn from the intersection point of AD and AS curves. For an increase in e or w* or p*, the aggregate demand curve, ceteris paribus, will shift outward to AD'. As a result, the new equilibrium levels of output and price will be higher at $\bar{Q}_1$ and $\bar{P}_1$ respectively. Conversely, a decline in e or w* or p* will cause the AD curve to shift inward to AD''. Consequently, the new equilibrium levels of output and price will be lower at $\bar{Q}_2$ and $\bar{P}_2$ respectively. Any relaxations of the restrictions on remittance outflows by the labor-importing countries will cause the AD curve to shift outward to AD' as shown before. Hence the new equilibrium output and price levels will be higher. Conversely, a rise in restrictions on remittance outflows will reduce the levels of output and price by causing the AD curve to shift inward.

To show the output and price effects of a supply shock, comparative statics are derived with respect to the nominal wage rate (w) in the labor-exporting developing country as follows:

F. Effects of an Increase in Domestic Nominal Wage on Output and Price in the Labor-Exporting Developing Country

Differentiating further with respect to w,

$$[J] \begin{bmatrix} \dfrac{dQ}{dw} \\[2em] \dfrac{dp}{dw} \end{bmatrix} = \begin{bmatrix} Q'L'\dfrac{1}{p} \\[2em] (C'-M_1)\left\{Q'L'\dfrac{1}{p} - R'E'(\dfrac{w^*}{w})^2 e\right\} \end{bmatrix}$$

The constant terms,

$$B = Q'L'\frac{1}{p} < 0 \text{ and } D = (C'-M_1)\left\{Q'L'\frac{1}{p} - R'E'(\frac{w^*}{w})^2 e\right\} < 0,$$

assuming that $C' > M_1$.

By using Cramer's rule

$$\frac{dQ}{dw} = \frac{Q'L''\dfrac{1}{p}\left[\dfrac{ep^*}{p^2}(X_2-M_2) - \dfrac{w}{p}(C'-M_1)\left\{Q'L'\dfrac{1}{p} - R'E'(\dfrac{w^*}{w})^2 e\right\}\right]}{|J|} < 0$$

and

$$\frac{dp}{dw} = \frac{(C'-M_1)\{Q'L'\frac{1}{p} - R'E'(\frac{w^*}{w})^2 e\} - Q'L'\frac{1}{p}}{|J|} \gtreqless 0$$

The comparative statics reveal that an increase in nominal wage in the labor-exporting developing economy will reduce the demand for labor. As a result, the supply of national output will decline. But its effect on the domestic price level remains ambiguous. The ambiguities spring from the fact that the nominal wage appears in both AS and AD functions. The price level should rise following a shift in the AS curve to the left, ceteris paribus. But the rise in domestic nominal wage is likely to reduce outmigration and hence a decline in concomitant remittances. This, in turn, will dampen the aggregate demand. So, the effect on price level is likely to remain indeterminate.

IV. Conclusions and Remarks

The comparative statics results reveal that the exchange rate devaluation by the labor-exporting country, and increases in host country nominal wage, national income and the world price have expansionary effects on output and price in the labor-exporting economy. But imposition of any restrictions on the outflow of remittances by the labor-importing country will unleash recessionary forces in the labor-exporting country. An increase in domestic nominal wage in the labor-exporting developing country will reduce the national output. But its price effect is ambiguous.

The model implies that the purchasing parity theory (PPP) does not, in fact, hold in the labor-exporting developing economy. It is so for a number of reasons, such as, i) the existence of a sizable nontraded sector, ii) tariff and quantitative restrictions, iii) subsidies, etc. The current work may be extended by subjecting it to empirical inquires. Output and price equations can be estimated in levels or in long-forms by employing time series or cross-sectional data in terms of exchange rate, foreign and domestic nominal wages, foreign price, foreign GNP and the migrant workers' consumption expenditures in host countries. The model is capable of explaining output and price behavior in a large number of labor-exporting developing countries of Asia and Africa, in particular.

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