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by

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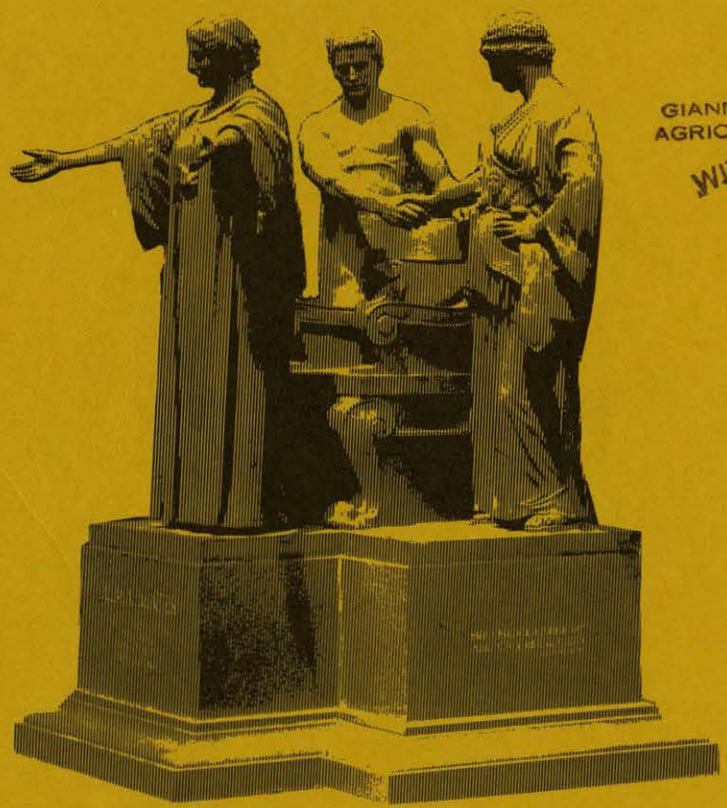



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ABSTRACT

The Nepal trade balance deteriorated sharply after 1974. Conventional wisdom attributed the decline to a stagnant agricultural sector. A monetary model which endogenizes the real exchange rate is developed to explain changes in the balance of payments. Foreign aid inflows are found to be the principal source of the worsening trade deficit. Since agricultural goods are primarily tradable, a consequence of the declining real exchange rate is a deteriorating terms of trade for agriculture.

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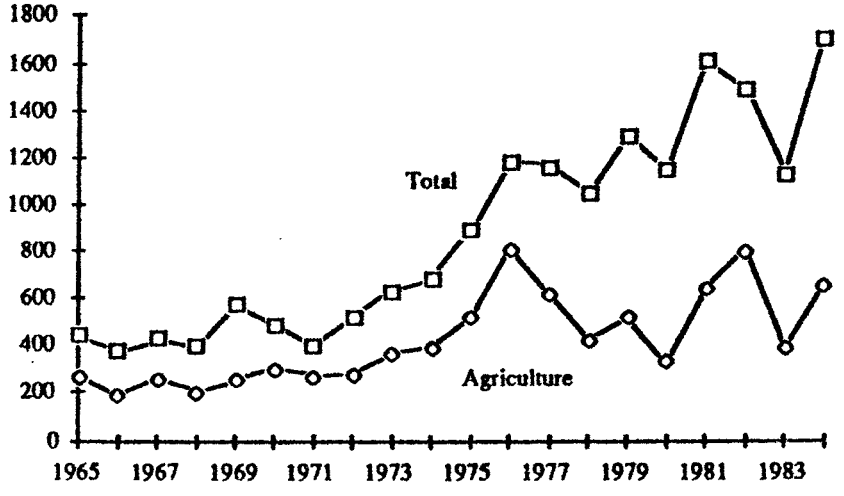
## Explaining the Nepalese Trade Deficit: Foreign Aid or Stagnant Agriculture

In most LDCs agriculture is home to a substantial part of the economy's resources - it employs a large part of the labor, capital, and land resources of the economy - and often is a major source of export earnings. If a large trade deficit arises, it is reasonable to look to the performance of the agricultural sector for an explanation.

The Nepalese trade deficit worsened dramatically beginning in 1974 (Nepal Rastra Bank), growing from 478 million rupees in 1974 (3.7 percent of GDP) to more than 6 billion rupees in 1986 (12.5 percent of GDP). In the early 1980s, foreign exchange reserves declined dramatically, from $176 million in December 1980 to $82.4 million in September 1986 (IMF, International Financial Statistics), and external debt rose from $204.3 million in 1981 to $626 .4 million in 1986 (Asian Development Bank (ADB), 1987).

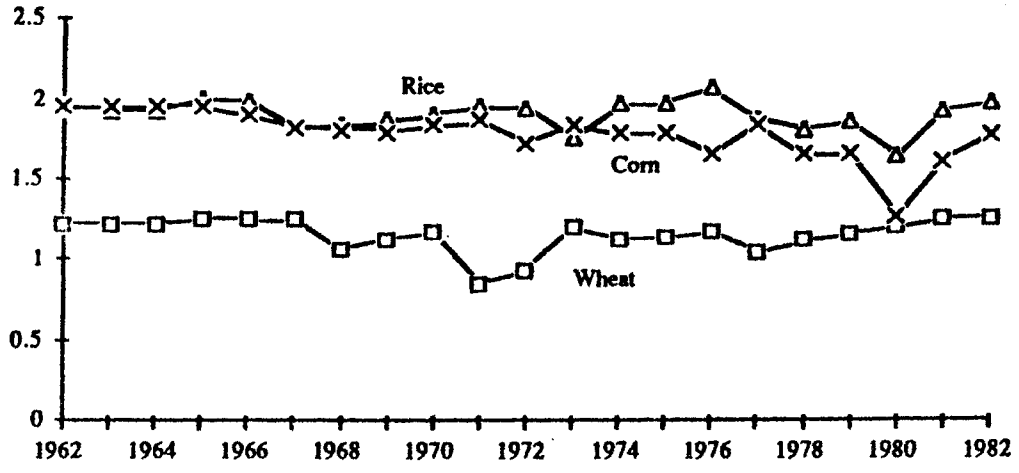
Of the potential causes of trade deficits - overvalued exchange rates, excess aggregate demand and slow growth in aggregate production (Kahn) - inadequate growth in aggregate production due to poor performance of the agricultural sector is an obvious suspect. Agriculture is the largest sector in the Nepalese economy. In 1986, 90 percent of the labor force was employed in agriculture and agriculture accounted for 60 percent of GDP (ADB, 1988). These figures had changed little from 1965 when they stood at 94 and 65 percent. (World Bank, 1986). Agricultural products traditionally made up the bulk of exports (Figure 1), and the agricultural trade balance has become negative in recent years (Nepal Rastra Bank). Between 1957 and 1979, agricultural imports were greater than exports only two times. However, of the five years between 1980 and 1984, agricultural trade was in deficit four years. Agricultural imports grew steadily between 1957 and 1984, but agricultural exports peaked in 1976 and have been quite volatile since then. Agricultural exports declined from 61 percent of total exports in 1965 to 39 percent in 1984.

Figure 1: Nepalese Exports: 1965-84
(million rupees)




To support the presumption that stagnant agricultural production is the primary source of the growing trade deficit, evidence of stagnant agricultural productivity can be cited (Svejnar and Thorbecke, Yadav). Grain production dominates agricultural output (ADB, 1982). In 1982, the combined areas of rice, maize, wheat, barley and millet accounted for more than 90 percent of Nepal's total crop area. Of the grains, rice is by far the most widely grown, accounting for over 50 percent of the total crop area, while its nearest competitors, maize and wheat, lag far behind at 19 and 16 percent, respectively. From 1965 to 1982, the total area under cultivation increased from 1.9 million hectares to 2.5 million hectares, a 31 percent increase. However, yields of the three most important crops - rice, corn and wheat - were stagnant (Figure 2). This fact is especially remarkable in a part of the world where rice and wheat yields have shown dramatic increases from Green Revolution technology. Unlike other parts of South Asia, use of fertilizer and modern seeds is extremely low. Per hectare fertilizer consumption rates in 1983 were less than one-fourth of those in Bangladesh and Pakistan (World Bank, 1986) and the portion of total rice area under modern varieties in 1982 was only 26 percent (Svejnar and Thorbecke).

Figure 2: Nepalese Rice and Corn Yields, 1962-82
(mt/ha)




Source: Svejnar and Thorbecke

Little research has been done to examine the linkages between agricultural performance and the trade balance for Nepal, and in fact, this issue has been seldom addressed in the literature. Rather than address the issue directly, we use a simple macroeconomic model that provides insights into the sources and effects of excess aggregate demand on the trade balance. We develop an open-economy monetary model in which the trade balance is the only endogenous element in the balance of payments (see, for example, Frenkel and Johnson, 1976 and IMF 1977 for similar models). This model allows us to identify the relative importance of domestic and external determinants of the trade balance. Furthermore, because the real exchange rate (the ratio of the prices of traded to nontraded goods) is made endogenous, the model allows examination of the links from macroeconomic developments to sectoral incentives.[1] Since most tradable goods are agricultural goods, changes in the real exchange rate are essentially equivalent to changes in the agricultural terms of trade. Our main conclusion is that the trade deficit is first and foremost a

1. This definition of the real exchange rate is used by most economists working in this area. See Edwards and Ng (1985) for a review of alternative definitions.

result of excess aggregate demand. In fact, macroeconomic developments reduced the incentives for agricultural production and transferred resources out of agriculture although we are unable to specify the magnitude of that effect.

Macroeconomic Determinants of the Trade Balance

Many elements of macro models used in analyzing developed countries (DCs) are not appropriate for LDCs. At least three stylized differences exist - in exchange rate determination, in diversity and marketability of financial assets, and in share of agriculture in GDP and trade. While most DC exchange rates are floating and exchange rate instability is a major issue, most LDC exchange rates are fixed with respect to the major trading partner. Hence, short and medium term adjustment to macroeconomic disequilibrium takes place not in exchange rates but in foreign exchange reserves. When access to these reserves is administered, an unofficial exchange market develops. Macroeconomic equilibrium is equivalent to balance of payments equilibrium and to long run stability in foreign exchange reserves. Low foreign exchange reserves is the signal which brings the IMF and its unpalatable adjustment programs. For these reasons, maintaining external balance is an especially important political as well as economic concern. In addition, the range of assets available, especially in the poorest LDCs such as Nepal, is limited, and asset markets typically are not well developed. Often domestic currency and physical goods are the only asset choices. Formal interest rates are administered and access to formal domestic credit is rationed. A secondary bond market seldom exists, and the central bank is often the only buyer of government debt. Capital flows into the country are often determined by factors other than interest rate differentials. Foreign investment in LDCs is based on long run profit expectations and ability to repatriate profits, loan repayments are contractual and fixed, and foreign assistance is determined by donor agencies (Hemphill). Remittances from overseas workers are determined by growth abroad. Given these stylized characteristics of LDC exchange rates and asset markets, most elements of the capital account of the balance of payments are exogenous, and a concern with maintaining external balance becomes a concern with the trade balance as the principal endogenous

item. Finally, for most LDCs, agricultural output dominates the economy. Since agricultural prices respond quickly to changes in market conditions, aggregate price flexibility in LDCs is likely to be greater than in DCs. The small country assumption is applicable to all traded goods in LDCs and most goods, especially agricultural goods, are tradable. Hence, macro policies which change the real exchange rate have a direct effect on agriculture.

In our model, equilibrium in the money market is reached by changes in the trade balance and money balances of the public. The monetary base is determined by two items, the amount of domestic credit and foreign exchange reserves held by the central bank (see Lal for a more detailed discussion of these relationships).

$$\dot{H} = \dot{D} + \dot{F} \qquad (1)$$

H = monetary base or "high-powered" money

D = domestic credit held by central bank

F = foreign assets held by central bank (gold, foreign exchange, SDRs, denominated in Nepalese Rupees)

$\dot{}$ = the change in a stock variable over time

Increases in $\dot{D}$ arise primarily from the budget deficit[2]. All domestic debt held by the central bank (and therefore with an effect on the money supply) is assumed to be government debt. It is assumed that all foreign exchange transactions occur with the central bank so that ($\dot{F}$) is equal to the sum of the current and capital accounts. Changes in foreign assets can be separated into the trade surplus (T) and exogenous items ($\dot{F}^*$ - net foreign loans, foreign investment, and grants and remittances less revaluation of foreign asset stocks to reflect exchange rate and other changes in their rupee value).

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2. Off-budget financing of public sector firms might also have been important in Nepal, but that has proven difficult to document.

$$\dot{F} = \dot{F}^* + T \qquad (2)$$

T = trade surplus
$F^*$ = exogenous changes in foreign assets held by the monetary authorities

Equation (2) can then be substituted into (1).

$$\dot{H} = \dot{D} + \dot{F}^* + T \qquad (3)$$

The money supply is equal to the money base times the money multiplier.

$$\dot{M} = m(\dot{D} + \dot{F}^* + T) \qquad (4)$$

M = money supply
m = money multiplier

Demand for money is assumed to take the form of a simple version of the Cambridge equation.

$$L = cPY \qquad (5)$$

L = demand for money
c = ratio of money demanded to nominal income
P = aggregate price level
Y = real income

Changes in money demand are given by:

$$\dot{L} = cP\dot{Y} + c\dot{P}Y \qquad (6)$$

In developed economies, macroeconomic models assume and empirical evidence supports the idea that with well-functioning capital markets, demand for money (as one element in a portfolio of financial assets) is not only a function of prices and income but of the interest rate as well (eg. Laidler). However, in Nepal few interest bearing assets exist as an alternative to money holding, and informal credit arrangements are likely to dominate the credit market. It is doubtful that formal interest rates have much influence on the demand for money and information on informal rates is unavailable.

Equilibrium in the money market requires that the change in money demand must equal the change in money supply.

$$\dot{L} = \dot{M} \qquad (7)$$

Substituting from equation (4) for $\dot{M}$ and solving for the trade balance yields equation (8).

$$T = 1/m(\dot{L}) - \dot{D} - \dot{F}^* \qquad (8)$$

A trade deficit arises when an increase in the money supply caused either by a budget deficit ($\dot{D}$) or an increase in exogenous inflow of foreign funds ($\dot{F}^*$) is not fully absorbed by an increase in demand for money ($\dot{L}$).

The demand for money is a function of both the level of real income and the price level. While real income and prices are assumed exogenous, the change in the price level is not. The aggregate price level is a weighted average of the prices of traded and nontraded goods, where traded goods are those commodities whose domestic prices are determined by border prices and can be changed only through tariffs or changes in the exchange rate (Corden, 1981).

$$\dot{P} = (1-n)\dot{P}_T + n\,\dot{P}_N \qquad (9)$$

$P_T$ = price of traded goods ( $P_T = XP_B$, where X is the exchange rate and $P_B$ is the border price)
$P_N$ = price of nontraded goods
n = expenditure share on nontraded goods

The price of nontraded goods should change with an exogenous change in the domestic or foreign holdings of the Central Bank, and the price of tradable goods and we assume a linear relationship.[3]

$$\dot{P}_N = a + d\dot{D} + f\dot{F}^* + t\dot{P}_T \qquad (10)$$

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3. In equation 10, we expect d to be larger than f. Exogenous changes in foreign exchange reserves are primarily the result of foreign assistance. Since much aid is tied to expenditure on foreign (i.e. tradable) goods, it should have less impact on the price of nontradables.

Incorporating the tradable and nontradable price indices into the money demand function yields equation (11):

$$\dot{L} = cn(\dot{P}_N Y + P_N \dot{Y}) + c(1 - n)(\dot{P}_T Y + P_T \dot{Y}) \qquad (11)$$

The complete model consists of a system of simultaneous equations (10), (11), (8).

$$\dot{P}_N = a + d\dot{D} + f\dot{F}^* + \dot{P}_T \qquad (10)$$

$$\dot{L} = cn(\dot{P}_N Y + P_N \dot{Y}) + c(1 - n)(\dot{P}_T Y + P_T \dot{Y}) \qquad (11)$$

$$T = 1/m(\dot{L}) - \dot{D} - \dot{F}^* \qquad (8)$$

It is useful to trace through the impact of a change in the asset holdings of the monetary authorities, caused for example, by a new infusion of foreign aid. An increase in foreign exchange holdings causes an increase in base money and through the money multiplier, an increase in the money supply. The increase in money supply must either be absorbed in increased money balances or exchanged with the monetary authorities for foreign exchange to purchase imports. The increase in aggregate demand caused by the foreign aid pushes up the nontraded goods price relative to the traded goods price (which is determined by the world price of traded goods times the exchange rate, both of which are exogenous). Part of the increase in the money supply is absorbed in increased money balances held by the public ($\dot{L}$). The remainder translates into a trade deficit. The new equilibrium in the money market is caused by some combination of an increase in money balances and a reduction in foreign exchange reserves.

The model implicitly assumes that adequate stocks of foreign exchange reserves are available to meet the draw down caused by a trade deficit.[4] If the increase in money supply is caused by an exogenous increase in foreign capital inflows, this assumption is reasonable. In fact, a foreign exchange inflow results in a net increase in foreign exchange reserves if part of the increased money supply is held in the form of increased nominal balances. However, if the

4. Another implicit assumption (widely used in monetary models) is that changes in real output or its distribution between traded and nontraded goods are exogenous.

domestic asset holdings of the central bank are increased, a net draw down on foreign exchange reserves will result. If insufficient foreign exchange reserves are available to meet the trade deficit, the authorities have two options - devalue or limit foreign exchange purchases. Both options raise the price of traded goods, increase money demand and restore equilibrium.

Determinants of the Nepal Trade Balance

To estimate the model for Nepal, it was first necessary to create tradable and nontradable goods price indices. Eleven common elements of the consumer price indices of Nepal and India were correlated[5]. Indian prices rather than world prices were chosen because Nepal shares a 500 mile open border with the much larger Indian economy. A significant positive correlation between the Nepal and Indian prices of specific commodities was assumed to identify a tradable good, and Nepal and Indian prices of grains, pulses, vegetables, and spices were found to be positively correlated. The nontraded index is based on prices of fuel, cloth, sugar and milk, the only commodities for which complete time series data were available. The price indices were calculated by weighting each commodity by its share in the Kathmandu price index.[6] The estimating Equations 10', 11', and 8' include an error term .[7] Equation 11' differs from Equation 11 in that two extra terms - $cn \dot{P}_N \dot{Y}$ and $c(1-n) \dot{P}_T \dot{Y}$ - have been added to account for the fact that we are using first differences over a year.

$$\dot{P}_N = a + d\dot{D} + f\dot{F}^* + t\dot{P}_T + e_1 \qquad (10')$$

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5. The Nepalese price index used was based on Terai prices, the region bordering India which is the source of most of the Nepal GDP.

6. The weights of the commodities in the two indices make up about three fourths of the total weights in the Kathmandu CPI. Data on the remaining one fourth of the components are not available, and it is assumed that they are divided between tradable and nontradable goods in the same proportion as the comodities for which information is available.

7. Note that the source of the error term ine Equation 8', $e_3$, is problematic. It certainly consists, at least in part, of the error from the demand for money, $e_2$. Thus, correlation between L and $e_3$ must be accounted for in the estimation of the system consisting of Equations 10', 11', and 8'. This was done using iterative three stage least squares.

$$\dot{L} = cn(\dot{P}_N Y + P_N \dot{Y} + \dot{P}_N \dot{Y}) + c(1 - n)(\dot{P}_T Y + P_T \dot{Y} + \dot{P}_T \dot{Y}) + e_2 \qquad (11')$$

$$T = 1/m(\dot{L}) + g\dot{D} + h\dot{F}^* + e_3 \qquad (8')$$

The model was estimated using the iterative three stage least squares technique, both with the g and h coefficients unconstrained and constrained as implied by Equation 8 (Table 1). The results differed little and the following discussion refers only to the unconstrained results.[8] In general, the signs of the coefficients are as predicted, the values do not differ significantly (at the five percent level) from the hypothesized values, and the adjusted $R^2$s are high (Table 1). Two parameters of the model, the money multiplier (m) and the share of nontraded goods in expenditure (n), can also be determined outside the model, and hence provide a check on the consistency of the model. The average value of m between 1963 and 1986 was 1.4, and varied only slightly over this period. The coefficient of $\dot{L}$ in Equation 8' is 1/m and its estimated value of 0.823 implies a value for m of 1.22 which does not differ significantly from 1.4. The grains, which make up the lion's share of the tradable goods index, contribute roughly 35 percent to Nepal GNP. Hence, the expenditure share of nontradables (n) should not be significantly greater than 0.65, and must be between 0 and 1. The estimated value of n of 0.727 meets these criteria.[9]

With the model results, we can now assess the relative importance of the two exogenous variables - $\dot{D}$ and $\dot{F}^*$ - in determining the trade balance[10]. From the reduced form,

$$\frac{dT}{d\dot{D}} = \frac{cnd(\dot{Y} + Y)}{m} + g \qquad (12)$$

$$\frac{dT}{d\dot{F}^*} = \frac{cnf(\dot{Y} + Y)}{m} + h \qquad (13)$$

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8. All estimated equations included an intercept, whether or not the theory specified one. This approach provides a further check on the appropriateness of the model.

9. From Equation 11' the ratio of the coefficient of PNCOMP to that of PTCOMP is equal to n/(1-n), implying the value of n given in the text.

10. A third exogenous variable over which the government has control is the nominal exchange rate. During the period under examination, changes in the nominal exchange rate were minor.

TABLE 1: Iterative 3SLS OF Nepal's Money Market

| | Unrestricted Equations | | | Restricted Equations | | |
|---|---|---|---|---|---|---|
| Variables | $\dot{P}_N$ | $\dot{L}$ | T | $\dot{P}_N$ | $\dot{L}$ | T |
| $\dot{D}$ | 0.1679<br>(0.0603) | - | -1.0713<br>(0.0528) | 0.1126<br>(0.0462) | - | -1.0000<br>(NA) |
| $\dot{F}^*$ | 0.0399<br>(0.0155) | - | -0.9888<br>(0.0260) | 0.0524<br>(0.0127) | - | -1.0000<br>(NA) |
| $\dot{P}_T$ | -0.0498<br>(0.0910) | - | - | -0.0653<br>(0.0890) | - | - |
| PNCOMP[1] | - | 0.0494<br>(0.0075) | - | - | 0.0482<br>(0.0067) | - |
| PTCOMP[2] | - | 0.0186<br>(0.0076) | - | - | 0.0207<br>(0.0071) | - |
| $\dot{L}$ | - | - | 0.8230<br>(0.1597) | - | - | 0.7983<br>(0.0449) |
| CONST | 0.0448<br>(0.0249) | -0.0084<br>(0.0573) | -0.0226<br>(0.0207) | 0.0398<br>(0.0248) | -0.0094<br>(0.0562) | -0.0150<br>(0.0201) |
| $R^2$ | .732 | .679 | .999 | .718 | .681 | .999 |
| DW | 2.329 | 1.965 | 2.546 | 2.580 | 1.956 | 2.873 |
| SYSTEM $R^2$ = .9996 | | | | SYSTEM $R^2$ = 0.9995 | | |

Sources: See Data appendix.

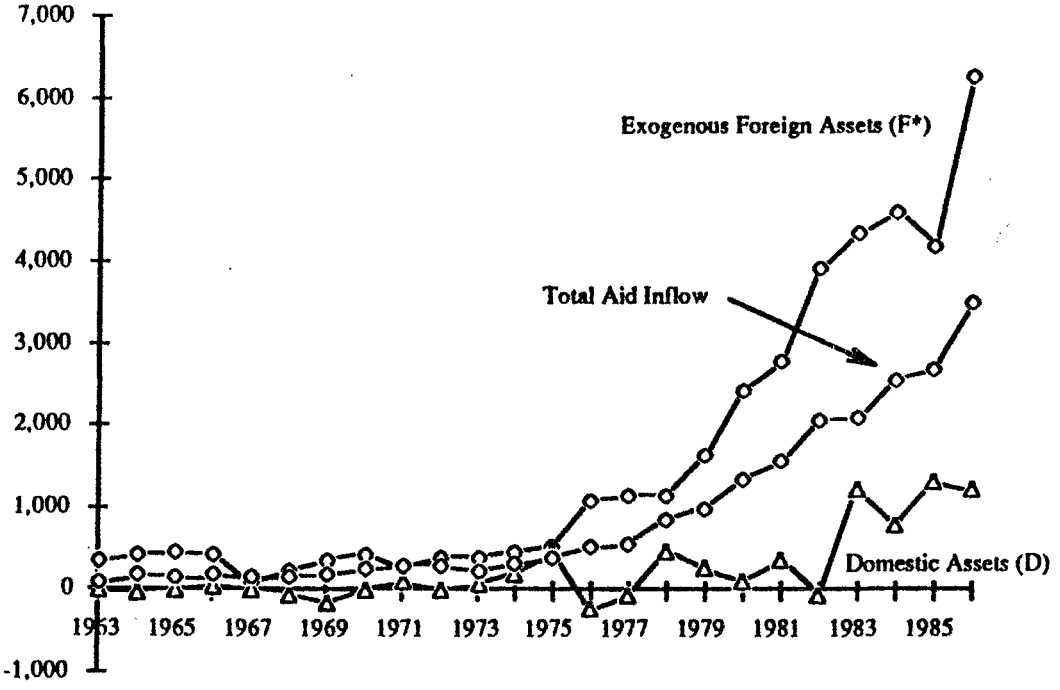
Notes:
1. PNCOMP = $(\dot{P}_N Y + P_N \dot{Y} + \dot{P}_N \dot{Y})$
2. PTCOMP = $(\dot{P}_T Y + P_T \dot{Y} + \dot{P}_T \dot{Y})$

The direct effects on T of unit changes in $\dot{D}$ and $\dot{F}^*$ (g and h from the unconstrained equations) are -1.07 and -0.99 respectively. The total effects differ somewhat, because of the indirect effects through changes in $\dot{P}_N$ and money balances. For 1986, Y was 29.4 billion rupees, $\dot{Y}$ was 1.15 billion rupees. For that year, the values of the total derivatives of T with respect to $\dot{D}$ and $\dot{F}^*$ are

-0.86 and -0.94 respectively. Interestingly, while the direct effect on T of $\dot{F}^*$ is less than $\dot{D}$ (g is greater than h in absolute terms), the total effect is as expected because $\dot{D}$ has a greater effect on $\dot{P}_N$ than does $\dot{F}^*$.[11]

Exogenous foreign inflows ($\dot{F}^*$) increased dramatically after 1973, as foreign aid inflows increased rapidly (possibly due to the start of Asian Development Bank lending to Nepal) (Figure 3a). On the other hand, domestic assets held by the central bank (D) increased more slowly than foreign inflows until after 1982 when domestic asset holding growth increased markedly.

Figure 3a: Changes in Domestic and Exogenous Foreign Assets, 1963-86 (million rupees)




Until the early 1980s, exogenous foreign capital inflows were much larger than additions to domestic debt and thus by far the most important contributor to the trade deficit (Figure 3a). After

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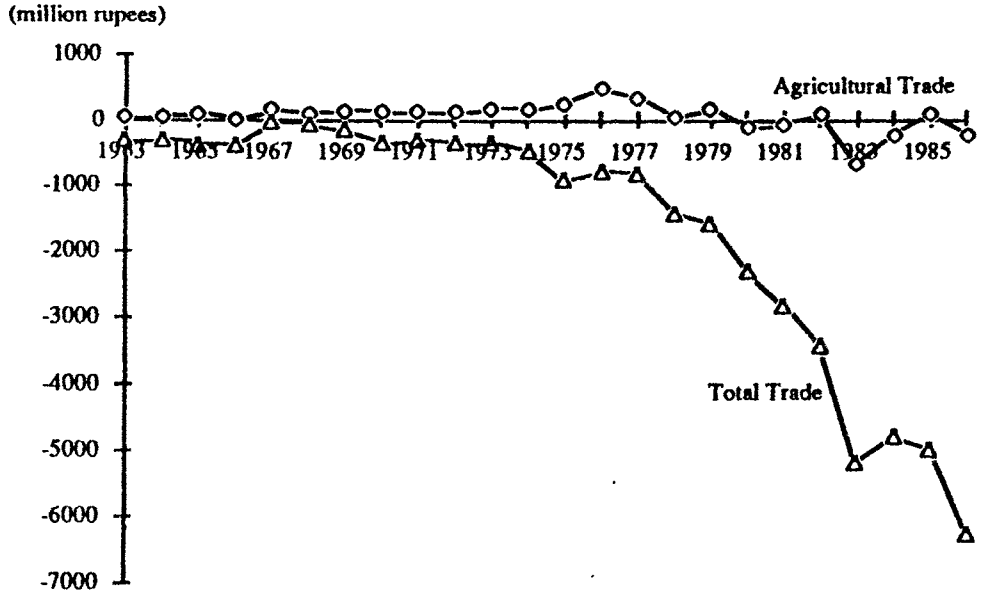
11. Since $\dot{F}^*$ is primarily foreign aid used to purchase imports we might expect both the direct effect and indirect effect on T to be greater than with $\dot{D}$.

1982, however, growth in monetary authority holdings of domestic assets accelerated. Changes in domestic asset holdings also contribute to the trade deficit, but unlike foreign aid, reduce foreign exchange reserves. In late 1985, the IMF had to step in to provide balance of payments support.

Throughout the period ending in 1986, the agricultural trade balance was small (Figure 3b). Although it did show a small negative trend. The dramatic decline in the overall trade balance was due almost entirely to a decline in the nonagricultural trade balance.

Figure 3b: The Nepalese Trade "Surplus", 1953-1986:
Agriculture and Total

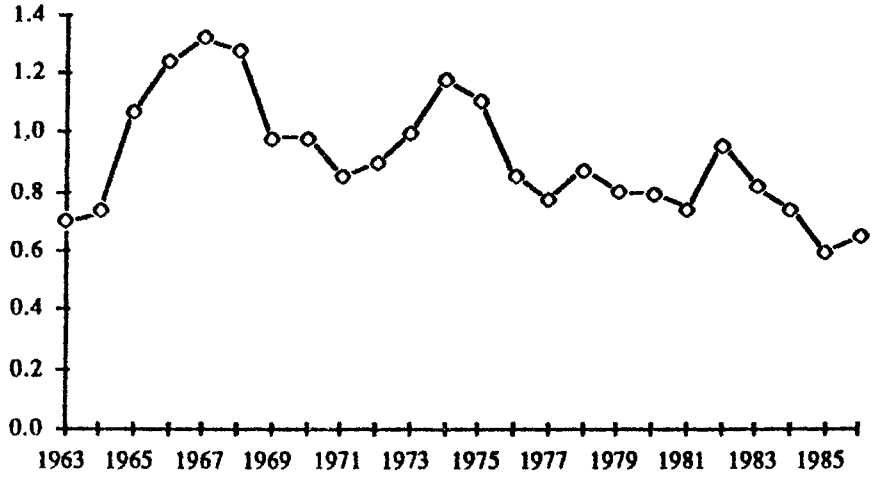



Effects on Agriculture in Nepal

The link from the macroeconomic developments to agriculture is via changes in the agriculture/nonagriculture terms of trade. Grain production uses 90 percent of the crop area, and grains and pulses together contribute over 60 percent of agricultural value added (Asian Development Bank, 1982). These two agricultural commodity categories were found to be traded goods (positive and significant correlation between Nepal and Indian prices of these commodities) and there are undoubtedly other agricultural products that are traded but for which we do not have

adequate data to test. The net effect is that factors affecting tradable goods are much the same as those affecting agricultural goods. Hence, changes in the real exchange rate (the ratio of the price of tradable goods to nontradable goods) caused by macroeconomic factors directly affect the incentives for agricultural production. Because the tradables price is exogenous, changes in the aggregate demand alter only nontradable goods prices and therefore the relative profitability of domestic production of tradable and nontradable goods. The nominal price of tradable goods (which is determined in India and therefore exogenous) increased 162 percent between 1973 and 1986, but nontradables prices increased 305 percent during the same period. The real exchange rate has declined secularly since 1967, and between 1973 and 1986 it fell from 100 to 65 (Figure 4). The rapid growth in the money supply, brought on first by the expansion in exogenous foreign asset holdings of the monetary authorities, and in the early 1980s by the growth in domestic debt, was responsible for the decline.

Figure 4: The Real Exchange Rate, 1963-1986
(1973=100)

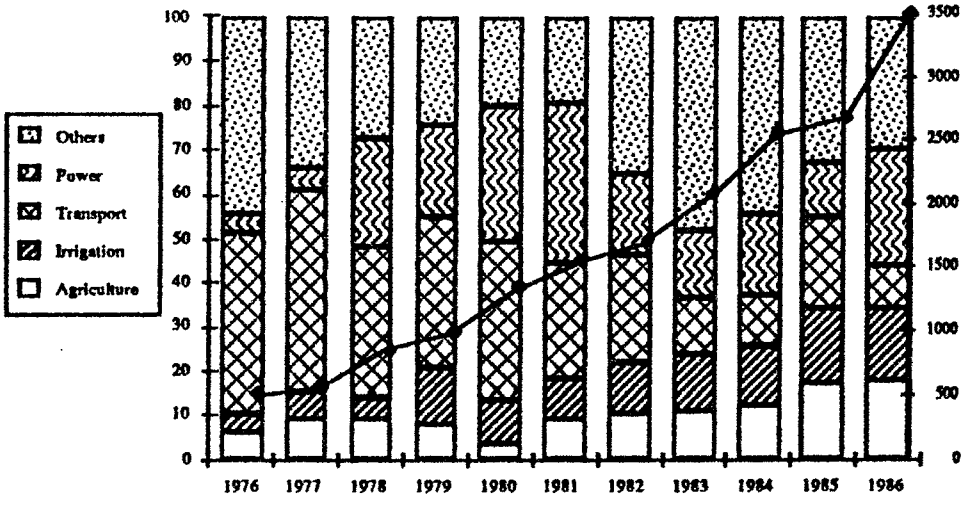


The decline in the real exchange rate results in a transfer of resources out of the agricultural sector (through the terms of trade effect), and a reduction in incentives to agricultural production. We are, however, unable to quantify the magnitude of that effect.

The Role of Foreign Assistance

Foreign aid plays two roles in determining the trade deficit - monetary and structural. Foreign aid is an inflow of foreign assets, usually designated to be spent on foreign-produced goods for a particular project. The resulting imports contribute to the negative trade balance. At the same time, foreign aid is given to add to the productive resources of the economy and to make the existing resources more productive. If successful, additional output is generated, a part of which can be exported to improve the trade balance. Total foreign aid disbursements grew from 505.6 million rupees in 1976 to almost 3.5 billion rupees in 1986 (ADB, 1988). Surprisingly, the share that went directly to support agriculture and irrigation started at only 10 percent and increased only to about 35 percent (Figure 5). Of course other foreign aid expenditures such as on the transport infrastructure would contribute to the productivity of agriculture as well as to the rest of the economy.

Figure 5: Total foreign aid and its distribution among sectors.




Source: ADB, 1988

Left Axis: Aid Disbursements by Sector, % of total.
Right Axis: Total Aid Disbursements, Million rupees.

We do not have the data to demonstrate the effects of foreign aid on agriculture with any degree of confidence. However, two bits of evidence suggest that aid did not make substantial contributions to agricultural productivity. Svejnar and Thorbecke, in their study on macroeconomic policies and agricultural performance, were unable to find any statistically significant effect of foreign aid on agricultural GDP. "For instance, while irrigation and roads [funded by foreign aid] have a significant positive effect on the (estimated) gross income terms of trade, their positive effect on the (estimated) agricultural surplus is statistically less convincing and their effects on agricultural GDP and the terms of trade indicators are totally insignificant" (p148, 149). Second, in linear regressions explaining GDP and agricultural GDP with foreign aid disbursements, the price level, and a trend, foreign aid (lagged three periods) has negative coefficients in both sets of regressions but is statistically significant only in explaining agricultural GDP (Table 2). While little weight should be attached to these ad-hoc regressions alone, they provide additional support for the conclusion that the positive effects of foreign aid on agricultural performance in Nepal, if any, are hard to demonstrate.

Table 2: Regressions of GDP and Agricultural GDP on Aid, the Price Level, and Time

| AID | P | TIME | CONST | $R^2$ | DW |
|---|---|---|---|---|---|
| 1) Real GDP | | | | | |
| -4.404 | 2,774 | 321.13 | 13,829 | 0.98 | 1.76 |
| (3.565) | ( 856.3) | (64.92) | (518.12) | | |
| 2) Real Agricultural GDP | | | | | |
| -7.580 | 2,824 | 9.793 | 10,174 | 0.90 | 1.95 |
| (3.165) | (760.4) | (57.65) | (460) | | |

Notes:
Aid - the total foreign assistance, lagged three periods.
P - the sum of the tradable and nontradable goods prices indices, weighted by the share of agriculture and nonagriculture in GDP.
Source: See Data Appendix

## Conclusions

Aggregate demand growth, caused by a rapid increase in foreign aid, was the principal determinant of the Nepalese trade deficit until the mid-1980s, when deficit spending became more important. Agriculture's share in the trade deficit growth was small relative to foreign aid and domestic asset growth. Agriculture's role in the trade deficit was in not "keeping up" productivity growth of tradable goods. A partial explanation for this poor performance was that excess demand lowered the real exchange rate which in Nepal is practically identical to the agricultural terms of trade, reducing the profitability of agricultural production. There is little evidence to suggest that foreign aid inflows contributed to agricultural productivity.

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## Data Appendix

| Year | Trade Balance | | GDP | | Money | Currency |
|---|---|---|---|---|---|---|
| | Total | Agriculture | Total | Agriculture | Supply | in circulation |
| 1957 | -74 | 14 | NA | NA | 92 | 84 |
| 1958 | -85 | -12 | 3,435 | NA | 101 | 90 |
| 1959 | -105 | 14 | 3,855 | NA | 116 | 96 |
| 1960 | -156 | 9 | 3,873 | NA | 174 | 120 |
| 1961 | -188 | 74 | 4,053 | NA | 205 | 152 |
| 1962 | -179 | 64 | 4,374 | NA | 244 | 165 |
| 1963 | -327 | 27 | 4,616 | NA | 265 | 178 |
| 1964 | -313 | 55 | 5,023 | NA | 366 | 258 |
| 1965 | -378 | 91 | 5,602 | 3,654 | 446 | 316 |
| 1966 | -407 | -1 | 6,907 | 4,794 | 522 | 367 |
| 1967 | -55 | 147 | 6,415 | 4,292 | 568 | 391 |
| 1968 | -85 | 101 | 7,173 | 4,883 | 619 | 484 |
| 1969 | -176 | 137 | 7,985 | 5,357 | 700 | 509 |
| 1970 | -365 | 123 | 8,768 | 5,922 | 763 | 569 |
| 1971 | -298 | 121 | 8,938 | 6,034 | 793 | 612 |
| 1972 | -368 | 110 | 10,369 | 7,106 | 858 | 643 |
| 1973 | -352 | 174 | 9,969 | 6,578 | 1,016 | 740 |
| 1974 | -478 | 153 | 12,808 | 8,851 | 1,281 | 927 |
| 1975 | -925 | 251 | 16,571 | 11,435 | 1,338 | 971 |
| 1976 | -796 | 469 | 17,394 | 11,495 | 1,453 | 1,024 |
| 1977 | -843 | 339 | 17,280 | 10,389 | 1,853 | 1,256 |
| 1978 | -1,423 | 24 | 19,732 | 11,616 | 2,061 | 1,427 |
| 1979 | -1,588 | 169 | 22,215 | 13,365 | 2,505 | 1,712 |
| 1980 | -2,330 | -135 | 23,351 | 13,520 | 2,830 | 1,909 |
| 1981 | -2,820 | -77 | 27,307 | 15,679 | 3,208 | 2,214 |
| 1982 | -3,439 | 79 | 30,265 | 17,903 | 3,612 | 2,618 |
| 1983 | -5,182 | -670 | 33,621 | 19,282 | 4,349 | 2,963 |
| 1984 | -4,810 | -222 | 38,184 | 22,317 | 4,932 | 3,554 |
| 1985 | -5,002 | 69 | 41,738 | 24,641 | 5,480 | 4,036 |
| 1986 | -6,263 | -222 | 50,124 | 29,973 | 7,029 | 5,235 |

Sources: See notes at end of table.

## Data Appendix, continued

| Year | Assets of Monetary Authorities | | Aid | Price Index of | |
|---|---|---|---|---|---|
| | Foreign | Domestic | Disbursements | Tradables | Nontradables |
| 1957 | 65 | 19 | 27 | NA | NA |
| 1958 | 77 | 13 | 58 | NA | NA |
| 1959 | 108 | -12 | 35 | NA | NA |
| 1960 | 148 | -28 | 125 | NA | NA |
| 1961 | 192 | -40 | 125 | NA | NA |
| 1962 | 223 | -58 | 183 | 44.9 | 53.1 |
| 1963 | 243 | -65 | 88 | 44.8 | 63.9 |
| 1964 | 359 | -100 | 177 | 51.1 | 69.5 |
| 1965 | 417 | -101 | 147 | 72.7 | 67.7 |
| 1966 | 430 | -63 | 179 | 88.5 | 71.5 |
| 1967 | 454 | -63 | 146 | 81.0 | 61.5 |
| 1968 | 605 | -121 | 158 | 100.8 | 78.8 |
| 1969 | 788 | -279 | 186 | 82.3 | 83.7 |
| 1970 | 850 | -281 | 251 | 84.3 | 85.7 |
| 1971 | 814 | -202 | 303 | 80.2 | 94.1 |
| 1972 | 838 | -195 | 281 | 84.4 | 94.0 |
| 1973 | 874 | -133 | 228 | 100.0 | 100.0 |
| 1974 | 861 | 66 | 311 | 129.1 | 109.9 |
| 1975 | 467 | 504 | 387 | 150.3 | 135.5 |
| 1976 | 756 | 269 | 506 | 124.4 | 144.8 |
| 1977 | 1,052 | 205 | 557 | 120.6 | 155.6 |
| 1978 | 769 | 658 | 858 | 137.9 | 157.6 |
| 1979 | 805 | 907 | 989 | 140.7 | 176.1 |
| 1980 | 896 | 1,013 | 1,341 | 153.6 | 193.8 |
| 1981 | 843 | 1,371 | 1,562 | 167.9 | 226.4 |
| 1982 | 1,306 | 1,311 | 2,059 | 233.3 | 243.9 |
| 1983 | 457 | 2,507 | 2,076 | 241.1 | 295.9 |
| 1984 | 255 | 3,299 | 2,547 | 238.6 | 322.3 |
| 1985 | -552 | 4,587 | 2,676 | 221.1 | 370.9 |
| 1986 | -541 | 5,775 | 3,492 | 262.2 | 405.4 |

Year - Nepalese fiscal year ending in Gregorian year indicated.

The following items are from the Nepal Rastra Bank, Quarterly Economic Bulletin Vol. XXI, Nos. 3 and 4, 1987. All are in million rupees.

Ag. Trade Balance (sum of trade of food and live animals, tobacco and beverages, and animal and vegetable oils and fats)
Trade Balance
Money Supply
Currency in Circulation
Net Foreign and Domestic Assets of Monetary Authorities.
Agricultural GDP
Nominal GDP - International Monetary Fund, International Financial Statistics.
Note: Series break in total GDP and ag. GDP with 1975 first year in new series.

Aid Disbursements - Svejnar and Thorbecke for 1957-1980; ADB, 1988 for 1981-86.
Price indices - The indices for the tradable and nontradable goods prices are constructed from prices for Terai urban consumers and are taken from various issues of the Nepal Rastra Bank, Quarterly Economic Bulletin. The weights are from the Kathmandu urban consumers index because no weights were given for the Terai series. The Indian prices used to determine whether a good was tradable or not were taken from the Bulletin of the Reserve Bank of India.