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Commodity Booms and Government Expenditure Responses

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Abstract

This paper develops a model incorporating asymmetric government expenditure behavior in response to a windfall revenue gain occasioned by a transitory commodity boom. The model is used to illustrate the transitional dynamics of a stylized economy during the boom period and the nature of the macroeconomic disequilibria which emerge in the post-boom period. Country case studies of Sri Lanka, Malaysia, and Kenya support the model's predictions and the protracted nature of adjustment following the waning of the boom.

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	<u>Page</u>
Summary	iii
I. Introduction	1
II. The Model	2
1. External sector	3
2. Nontraded goods sector	5
3. Monetary sector	6
4. Fiscal sector	7
III. Effects of a Commodity Boom	8
1. Steady-state equilibrium in pre-boom period	8
2. System response to a boom in the primary	9
IV. Country Experiences	15
1. Sri Lanka	15
2. Malaysia	20
3. Kenya	24
V. Conclusion and Policy Implications	27
Text Tables	
1. Sri Lanka: Export Unit Values	16
2. Sri Lanka: Fiscal Finances	18
3. Malaysia: Export Unit Values	21
4. Malaysia: Fiscal Finances	22
5. Kenya: Export Unit Values	25
6. Kenya: Fiscal Finances	26
Charts	
1. External Balance	10a
2. External and Internal Balance	10a
3. System Response to a Commodity Boom, $\gamma = 0$	10b
4. Internal and External Balance: Post-boom Policy Conflict	12a
5. Internal and External Balance: Effects of Fiscal Adjustment	12a
6. Revenue Windfall Spent on Nontraded Goods	14a
References	30

Summary

In a number of developing countries, short-lived booms in export commodity prices with attendant fiscal revenue gains have led to an expansion of expenditures in a manner inconsistent with the underlying revenue positions. As a result, at the end of the boom period, these countries have been faced with larger internal and external imbalances than they would have experienced otherwise. Subsequent adjustment has been achieved only slowly, through a drawn-out process of fiscal retrenchment.

This paper analyzes this phenomenon by developing a model in which expenditure levels are rigid downward. The model illustrates the transitional dynamics of a stylized economy during the boom period and the nature of the macroeconomic disequilibria that emerge during the post-boom period.

An analysis of experiences of commodity boom cycles in Sri Lanka, Malaysia, and Kenya is found to be consistent with the model's predictions. In these cases, the restoration of macroeconomic equilibria required a progressive fiscal retrenchment in the aftermath of the boom. However, the nature of the adjustment was found not to be uniform, reflecting in part the types of expenditures engendered by the boom (capital versus current) and the relative difficulties in reducing these.

A policy lesson that emerges from the paper is that it is more appropriate to stabilize expenditures in the face of fluctuating revenues than to maintain a constant fiscal balance. This policy would also lead to build-ups of international reserve during boom periods.



1. Introduction

Short-lived booms in export commodity prices with attendant revenue gains have prompted many developing economies to expand expenditures in a manner inconsistent with their underlying revenue positions. As a result, at the end of the boom period, these countries have been faced with larger internal (monetary and price stability) and external (trade) imbalances than they would have experienced otherwise. The subsequent adjustment, however, has generally been achieved only slowly, through a drawn-out period of fiscal retrenchment.

There are various plausible explanations for the emergence or widening of these imbalances. First, the observed behavior might be explained by the *short time horizon within which many governments operate*: a government may seek to extend its tenure or to enhance its image by expending the revenue windfall on the population or the bureaucracy. Second, some governments may have genuinely believed the commodity boom to be of a permanent nature, leading them to expand current expenditures, or even to embark on more rapid and ambitious government-financed development programs. 1/ Once initiated, however, such expenditures, particularly those related to capital projects, can be difficult to terminate in midcourse--for political as well as technological and economic reasons. A third explanation might be that in some countries, institutions do not exist whereby demands for publicly provided goods and services can be deflected in periods of budgetary surplus. Further, formal or informal interest groups, including the civil service, may intensify their lobbying efforts to secure programs or projects of benefit to themselves during periods of rising revenue. 2/ Lastly, a ministry of finance may lack the necessary control mechanisms to restrain higher expenditures by spending agencies when revenues are growing. The purpose of this paper, however, is not to analyze why governments behave in this way; 3/ rather, it is to present a model in which such behavior plays a pivotal role, and to draw out the implications on the internal and external balances of a small open economy. A secondary purpose is to use the model for analyzing

1/ For a broader description of the policy reactions of various countries to different types of exogenous shocks including export commodity price booms, see Tanzi (1986), who categorizes countries into three broad groups: (1) those that viewed rising public revenues as a temporary windfall, and used the proceeds to pay off foreign debt or to accumulate foreign assets, (2) those that expanded their levels of public investment, and (3) those that increased current expenditures, by raising the size of current transfers, expanding public employment, etc.

2/ See Niskanen (1971) on bureaucratic failure.

3/ While dealing with the question of the growth of government, Larkey et al. (1981) presents an overview of alternative theories of government behavior.

such episodes in selected countries in order to draw some general lessons.

Keeping these objectives in view, this paper presents a simple stylized model of the impact of a primary commodity boom/bust cycle on the external and internal balances of a small open primary-commodity exporting economy. The model is neoclassical, and distinguishes among a nontradable good, a tradable good, and a primary export good which is subject to a transitory exogenous price boom. Reflecting the dependence of many small open economies' fiscal systems on taxation of primary exports, a boom in the price of the primary export good generates not only an increase in foreign exchange earnings, but also a large revenue windfall to the government. The model contends that the government adjusts its expenditure level upward more rapidly during the boom period, with its attendant revenue windfall, than downward in the post-boom period, as revenues return to normal levels. This particular assumption is supported by Chu (1987), who observed that for eighteen countries in the early 1970s an increase in expenditures greater than the increase in revenues occasioned by the onset of the world commodity cycle occurred, and that these expenditures declined only slowly after the waning of the cycle. A similar pattern is corroborated by three country case studies (Sri Lanka, Malaysia, and Kenya) included in this paper.

The outline of the paper is as follows. Part II lays out the basic framework of the model. Part III analyzes the steady-state equilibrium prior to a commodity boom, the response of the stylized economy to the commodity boom, and the nature of the macroeconomic disequilibria which emerge in the post-boom period. Part IV reviews the experiences and policy responses of Sri Lanka, Malaysia, and Kenya in the course of the commodity price cycle each has faced in recent years. Finally, Part V concludes with policy implications and lessons.

II. The Model

The model developed below represents a synthesis of the stylized two-good model used by Rodríguez (1978) to analyze devaluation-inflation spirals and of the model used by Harberger (1983) to assess the impact of a permanent commodity boom on the real exchange rate (commonly referred to as the Dutch disease phenomenon). In particular, the convention used in Harberger of decomposing the traded goods sector into an "enclave" traditional (primary) export good subject to a price shock and other traded goods is integrated into Rodríguez's model, which, unlike Harberger's paper, introduces a fiscal sector and the possibility of deficit financing. Beyond this integration, the model is extended in three important aspects. First, a link between fiscal receipts and the

primary export good is introduced. ^{1/} Second, the model allows for the incremental revenues generated as a result of a commodity boom to be spent on either nontraded goods or traded goods. ^{2/} Finally, and most importantly, government expenditure behavior reflects the asymmetry noted earlier, resulting in a ratcheting up of expenditure during the boom period, which is brought down only slowly in the post-boom period.

The economy analyzed produces three composite goods--a nontraded good, a nonprimary traded good, and a primary export good. The economy is small and open, and takes its traded goods' prices as given and fixed. However, the primary export commodity is subject to an exogenous price boom. Furthermore, the primary export commodity has a life of its own. Thus, its output and its use of the economy's resources are fixed by past plantings (in the case of agricultural products such as coffee, cocoa, palm oil, rubber, etc.) or by past discoveries (in the case of mineral products such as oil, bauxite, etc.). The economy exports the entire production of the primary export good, and thus demands (and consumes) only the nontraded and traded goods.

The building blocks of the model are as follows:

1. External sector

a. Traded goods

Traded goods other than the primary commodity are treated as a composite commodity. For simplicity, the foreign currency price of the composite good is set equal to one, so that the domestic price is equal to the fixed nominal exchange rate. Supply of the traded good depends on the price of the traded good relative to the nontraded good, while demand for the traded good depends on the nominal prices of the traded and nontraded goods, nominal money balances, and the proportion of nominal government expenditures spent on the traded good (assumed to be parametric). Demand for traded good is homogeneous of degree one in its arguments. Thus, supply and demand for the traded good are specified as follows:

$$T^S = T^S (E/P_H) = T^S(e) \quad (1)$$

$$T^d = T^d (E, P_H, M; BG) = T^d (e, m; \beta g) \quad (2)$$

^{1/} Chu (1987), utilizing Rodríguez's two-good framework, links fiscal revenue to export supply and import demand. In this paper, the revenue linkage is with the traditional export good only, and the concern is with changes in fiscal revenue generated by an exogenous price boom of the primary export good.

^{2/} In Rodríguez, all deficit financing is spent on traded goods, whereas in Chu (1987) all additional government expenditure is assumed to be for nontraded goods.

where

$T^s (\cdot)$	=	supply of the traded good,
$T^d (\cdot)$	=	demand for the traded good,
E	=	nominal exchange rate defined as units of domestic currency per unit of foreign currency,
P_H	=	nominal price of the nontraded good,
$e = E/P_H$	=	the price of the traded good relative to the nontraded good,
M	=	nominal money balances,
$m = M/P_H$	=	the real stock of money balances,
β	=	proportion of government expenditures spent on traded goods,
G	=	nominal government expenditures,
g	=	volume of government expenditures,

and where

$$\partial T^s / \partial e > 0, \quad \partial T^d / \partial e < 0, \quad \partial T^d / \partial m > 0, \quad \text{and } 0 \leq \beta \leq 1.$$

b. Booming primary export good

National output of the booming commodity, measured in foreign currency terms, is denoted:

$$Z = P_B B \tag{3}$$

where

Z	=	foreign currency value of the national output of the primary commodity,
P_B	=	the world price of the commodity,
B	=	the volume of exports of the commodity.

As noted earlier, B is fixed by past plantings or past discoveries, and it is assumed that all output is exported. ^{1/} The disturbance to be analyzed is a change ΔZ resulting from an increase in the world price (ΔP_B), where Δ refers to the difference operator.

c. Trade balance and international reserves

In the absence of capital flows, changes in the stock of international reserves held by the Central Bank are determined by the trade balance:

^{1/} The production assumptions, coupled with the fact that no output is consumed domestically, implies that the cross-price elasticities of demand with respect to traded and nontraded goods are both zero and that the own-price elasticity of supply is also zero. While this latter assumption is a simplifying one, it is not unrealistic, since such elasticities tend to be small, especially in the short term.

$$\Delta IR = TB = T^S(e) + Z_0 - T^d(e, m; \beta g) \quad (4)$$

where IR = the stock of international reserves held by the Central Bank

TB = the trade balance,

and the time subscript 0 on Z indicates the pre-boom value of the primary commodity export.

From equation (4), it is easy to see that a real depreciation of the exchange rate improves the trade balance. ^{1/} On the other hand, a higher stock of real cash balances causes a deterioration in the trade balance. Setting $\Delta IR = 0$ and for the given value of foreign exchange earnings Z_0 , combinations of the real exchange rate and real money balances for which external balance is achieved can be found. This schedule is positively sloped in (e,m)-space. Intuitively, a decline in the real exchange rate e (i.e., an appreciation) results in a smaller traded goods supply (as producers shift to relatively more remunerative nontraded goods production) and a larger traded goods demand (as consumers shift toward relatively less expensive traded goods). Given Z_0 , an excess demand for foreign exchange exists. To dampen this demand, a decline in real cash balances m is necessary. Thus, the schedule along which $\Delta IR = 0$ (i.e., the external balance schedule) is positively sloped in (e,m)-space.

2. Nontraded goods sector

The economy produces and consumes a composite nontraded good. Output of this good depends on the relative price between the traded and nontraded good, while demand depends on the nominal prices of traded and nontraded goods, nominal money balances, and the proportion of nominal government expenditure spent on nontraded goods (assumed to be parametric). Demand for the nontraded good is also homogenous of degree one in its arguments. Market equilibrium in the nontraded good is continuous and effected via movements in the nominal price of home goods, such that at all times:

$$N^d(e, m; (1 - \beta) g) = N^S(e) \quad (5)$$

^{1/} Formally, $\partial TB / \partial e = \partial T^S / \partial e - \partial T^d / \partial e$, which can be signed as positive.

where

$$\begin{aligned} N^d(\cdot) &= \text{demand for the nontraded good,} \\ N^S(\cdot) &= \text{supply of the nontraded good,} \end{aligned}$$

and where

$$\partial N^d / \partial e > 0, \quad \partial N^d / \partial m > 0, \quad \text{and} \quad \partial N^S / \partial e < 0.$$

Given the assumption that the market for the nontraded good clears at all times, there exists a schedule, denoted NN , in (e,m) -space along which the excess demand for the nontraded good is zero. This schedule is negatively sloped. ^{1/} The economics behind this is simple. An increase in e results in an increased demand for the nontraded good since traded goods have become more expensive and, at the same time, in a decreased supply of nontraded goods as producers shift to the more remunerative production of traded goods. To dampen the excess demand for nontraded goods and to bring the market for nontraded goods back into equilibrium, a decline in real cash balances (effected via a higher price of the nontraded good) is necessary. Thus, the NN schedule is negatively sloped in (e,m) -space. The inverse relationship between e and m can be expressed as a reduced form:

$$m = n(e) \text{ with } n'(e) < 0. \quad (6)$$

3. Monetary sector

Two sources of monetary expansion are considered. First, when the trade balance is not in equilibrium (that is, when ΔIR does not equal zero), the change in the net foreign asset position of the central bank occasioned by the accumulation ($\Delta IR > 0$) or decumulation ($\Delta IR < 0$) of reserves affects the money supply. Second, the flow of credit to the government affects the money supply. Thus, the stock of money behaves according to:

$$\Delta M = E \Delta IR + \Delta D \quad (7)$$

where ΔD = the flow of credit to the government. Setting $\Delta M = 0$ defines a schedule along which the stock of money in the economy is neither increasing nor decreasing, and hence the price level is stable. As can be seen from equation (7), this internal balance schedule is directly related to the fiscal position of the government. In addition, so long as $\Delta D = 0$, the internal balance schedule and the external balance schedule are identical.

^{1/} Using equation (5),
 $\frac{de}{dm} = \frac{\partial N^d / \partial m}{\partial N^S / \partial e - \partial N^d / \partial e}$. This expression is negatively signed.

4. Fiscal sector

a. Fiscal revenue linkage

It is assumed that a proportion of any foreign exchange windfall from a transitory commodity boom is captured by the government: 1/

$$\Delta R = \gamma E \Delta Z \quad (8)$$

where R = government revenues in domestic currency terms,

γ = the proportion of the foreign exchange windfall captured directly by the government, with $0 \leq \gamma \leq 1$. 2/

The parameter γ is likely to be equal to 1, in cases where the government, through a marketing board or parastatal, fixes the domestic procurement price of the traditional export good, and does not pass on to producers changes in world prices, or if an explicit export tax is imposed to capture the full windfall. It will be less than 1 if part of the increase in price is passed on to the producers, or if the export tax captures only part of the windfall.

b. Government expenditure policy response

On the expenditure side, the government is assumed to have a target or desired level of expenditures that varies with its revenue position. Actual expenditures, however, are posited to adjust only partially to revenue changes. In order to reflect the asymmetric behavior of the government, the adjustment parameter is assumed to be greater during a revenue boom than during a nonboom period. Thus, expenditures are assumed to behave according to:

$$G_t^* = \lambda + \sigma R_t \quad (9)$$

$$\Delta G = \eta (G_t^* - G_{t-1}) \quad (10)$$

$$\eta = \eta' + \eta'' \text{ DUM} \quad (11)$$

1/ It is not necessary to assume these revenues are generated solely by export taxes. As Tanzi (1987) has pointed out, the revenue impact of variations in the value of exports may be captured via export duties, the corporate income tax, the personal income tax, or other channels. In addition, besides the first-round effect on tax revenues, commodity booms may generate expansion in the level of economic activity within a country, thus resulting in second-round tax revenue effects.

2/ If indirect revenues were also considered, γ could exceed 1--as might be the case, for example, if the boom-led expansion in economic activity caused revenues from other tax sources to increase.

where

- G^* = the desired or targeted level of government expenditure,
 G = actual government expenditure,
 η = partial adjustment parameter,
 λ, η', η'' = constants with η' and $\eta'' > 0$,
DUM = a dummy variable (1 during a fiscal boom period and 0 during a nonboom period). 1/

Assuming that $\sigma = 1$ 2/ and combining equations (9), (10), and (11) yields:

$$\Delta G = \lambda \eta' + \lambda \eta'' \text{ DUM} + (\eta' + \eta'' \text{ DUM})(R_t - G_{t-1}) . \quad (12)$$

The first two terms of the right-hand side of equation (12) represent the trend in government expenditures. Given the assumptions contained in equations (9), (10), and (11), and assuming that $\lambda \geq 0$ 3/, equation (12) suggests that the government raises the trend level of expenditures during a boom period. Equation (12) further indicates that government expenditure policy responds to the fiscal imbalance, as measured by the difference between current period revenue and last period's expenditure level. The strength of this response (or speed of adjustment) depends in part on whether or not the current period is characterized by a revenue windfall. This term indicates that if the fiscal imbalance, as measured by $R_t - G_{t-1}$ is positive (negative), then the government will respond by raising (cutting) expenditures by $(\eta' + \eta'')$ of the imbalance during a boom period and by η' of the imbalance during a nonboom period.

III. Effects of a Commodity Boom

1. Steady-state equilibrium in pre-boom period

Assuming that $R_0 = G_0$ (i.e., that the government's fiscal position is initially balanced), the steady-state values for the real exchange rate and real money balances can be found. By substituting equation (6) into equation (4) and setting $\Delta IR = 0$, the real exchange rate for which

1/ The dummy is defined with respect to the fiscal outcome. Thus, if none of the foreign exchange windfall is captured through the tax system (i.e., $\gamma = 0$), then $\text{DUM} = 0$.

2/ Thus λ can be interpreted as the targeted or desired government surplus or deficit (see equation (9)).

3/ If $\lambda = 0$ then the government targets a balanced budget; if $\lambda > 0$, then the government targets a deficit; and, if $\lambda < 0$, then the government targets a surplus.

external balance is achieved can be found. For the given value of foreign exchange earnings Z_0 , this real exchange rate is denoted \bar{e}_0 . Obviously $n(\bar{e}_0)$ is the level of real money balances \bar{m}_0 for which nontraded goods equilibrium is simultaneously established.

The long-run equilibrium achieved at \bar{e}_0 and \bar{m}_0 is characterized by both internal and external balance. At \bar{e}_0 , the trade balance is in equilibrium. This implies that the nominal stock of money is unchanging, since $\Delta IR = 0$ and $\Delta D = 0$ (since the budget is balanced). With the nominal stock of money constant, P_H cannot change. With P_H (as well as E and M) fixed, neither \bar{e}_0 nor \bar{m}_0 can change. Thus, the nontraded goods market is clearing and the internal price level is stable (i.e., P_H is fixed). On the external side, the excess of traded goods demand over traded goods supply ($T^d - T^s$) is exactly matched by revenues (Z_0) from the traditional export commodity (Figure 1).

Figure 2 characterizes this steady-state equilibrium. Along NN , defined by $m = n(e)$, the nontraded goods market is in equilibrium. Above NN , real money balances are too high and the real exchange (relatively) too depreciated, so that an excess demand for nontraded goods exists. Below NN , there is an excess supply of nontraded goods. The trade balance line (external balance), along which $\Delta IR = 0$, coincides (in the absence of credit to the government) with a monetary equilibrium line (internal balance), along which $\Delta M = 0$. To the right of this line, the real exchange rate is relatively too depreciated, resulting in a trade balance surplus ($\Delta IR > 0$), and hence an increasing nominal money stock, as the inflow of international reserves is monetized. To the left of this line, a trade balance deficit results from an overvalued real exchange rate; thus reserves are declining ($\Delta IR < 0$), resulting in contractionary pressures on the money supply. At point A , the real exchange rate and the level of real cash balances are such that both internal and external balances are achieved.

2. System response to a boom in the primary commodity export price

This section examines the response of the stylized economy to a boom in the primary commodity export price. For simplicity, only two periods are explicitly considered: the boom period ($t = 1$) and the post-boom period ($t = 2$). Three alternative cases are considered. In the first case, it is assumed that the government's fiscal system does not capture any of the windfall ($\gamma = 0$). In the second and third cases, it is assumed that the fiscal system captures the entire windfall ($\gamma = 1$). ^{1/} Furthermore, in the second case, it is assumed that the revenue windfall accruing to the government is spent entirely on traded goods. This case is meant to illustrate the dynamics of an economy which, in response to a transitory commodity boom, expands its capital budget. In the third case, it is assumed that the windfall is spent

^{1/} If only a portion of the windfall is captured, then $0 < \gamma < 1$. This case is not considered.

entirely on nontraded goods. This case is meant to capture the dynamics of an economy which, in response to a transitory commodity boom, increases current expenditures, such as wages or transfers. 1/

a. No revenue windfall ($\gamma = 0$)

Figure 3 illustrates the response of the system to a commodity price boom occurring at $t = 1$ that results in a new (higher) level of foreign exchange earnings from the traditional export good ($Z_1 = Z_0 + \Delta Z_0 = Z_0 + \Delta P_B B_0 > Z_0$), assuming that $\gamma = 0$ (i.e., that the government does not capture any of the windfall in its revenues). Since earnings from the traditional export good have risen, the real exchange rate for which external balance is achieved is now lower (i.e., has appreciated) and is denoted \bar{e}_1 . Intuitively, the reason for this is straightforward: with higher foreign exchange earnings from the traditional export good, the excess of traded goods demanded over traded goods supplied can be increased and financed by the increased foreign exchange earnings occasioned by the rise in the price of the traditional export good (Figure 1). 2/ This increase in the excess demand for traded goods is brought about by a decline (appreciation) of the equilibrium real exchange rate (Figure 3). Thus, the new external balance schedule lies to the left of the old one. Assuming that $\lambda = 0$ 3/, the new monetary equilibrium schedule (internal balance) also lies to the left of the old one and is again coincidental with the (new) external balance schedule. 4/

The dynamics of the transition to the new steady state occur as follows: upon the price boom, the old equilibrium point A lies to the right of the new external and internal balance schedules. Thus, at A, a trade balance surplus exists ($\Delta IR > 0$), and hence the nominal stock of money is increasing ($\Delta M > 0$). As the nominal stock of money increases, the price of nontraded goods rises. Together with a fixed nominal exchange rate, this implies that the real exchange rate is appreciating. In addition, real balances are increasing, since the proportionate increase in the nominal stock of money is greater than the proportionate increase in P_H . Thus, the economy moves from A along the \bar{NN} schedule, and comes to rest eventually at point A'. At point A', $\bar{e}_1 < \bar{e}_0$ and $\bar{m}_1 > \bar{m}_0$; trade is again balanced; the nominal money stock is again fixed; and the nontraded goods market is in equilibrium.

1/ It is certainly true that capital expenditures have a nontraded goods component, and that current expenditures have a traded goods component. Cases II and III as posited are thus meant only to be illustrative.

2/ At the new equilibrium real exchange rate, $\Delta (T^d - T^s) = \Delta Z_0$.

3/ That is, in setting its expenditure policy, the government desires or targets a balanced budget.

4/ Because the price boom has not affected government revenues, and hence expenditures, the budget remains in balance, and therefore credit to the government remains at zero ($\Delta D = 0$). At the same time, at \bar{e}_1 , $\Delta IR = 0$; thus, internal balance ($\Delta M = 0$) is also achieved at \bar{e}_1 .

Figure 1
External Balance

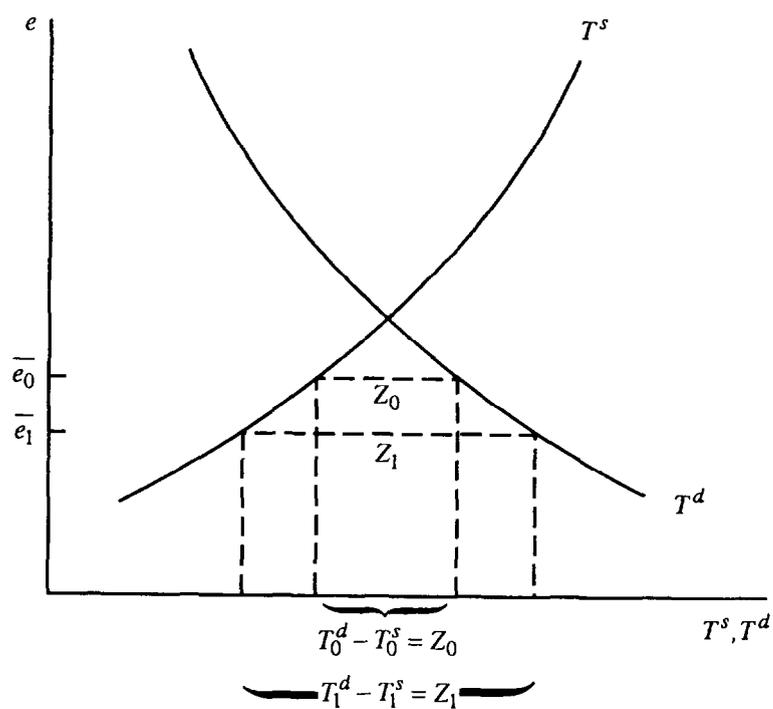




Figure 2
External and Internal Balance

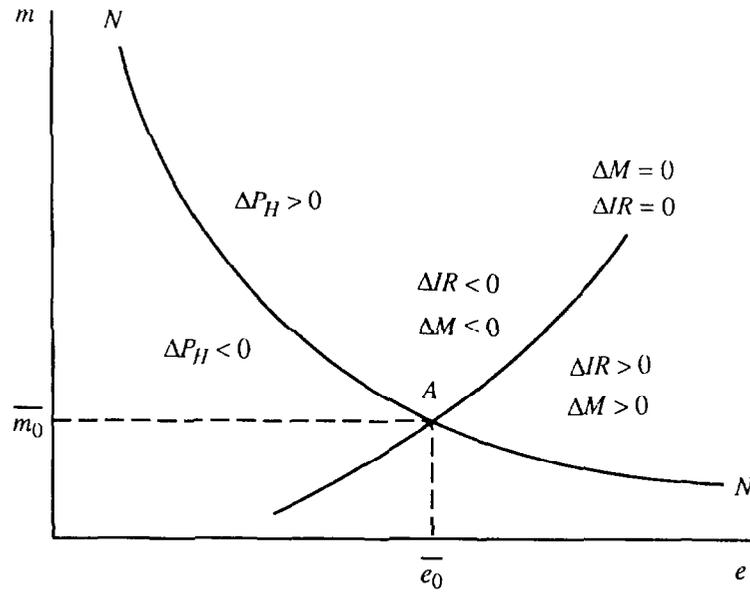
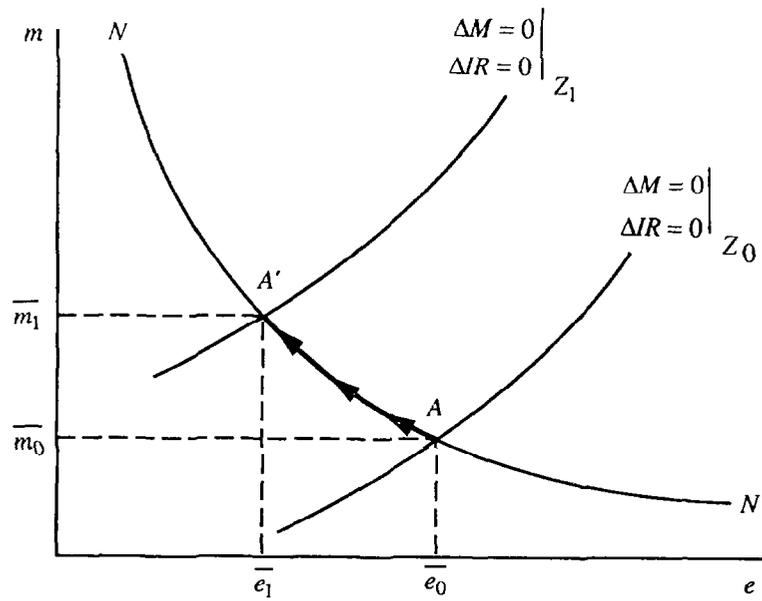


Figure 3
System Response to a Commodity Boom, $\gamma = 0$





At $t = 2$, when the boom subsides, a reverse process ensues. When foreign exchange receipts fall back to the level prevailing at $t = 0$, then the real exchange rate for which external balance is achieved is again e_0 ; the equilibrium level of real money balances is also the same as at $t = 0$, that is, m_0 . In essence, when the boom wanes at $t = 2$, the economy retraces its path back to the initial equilibrium.

b. Windfall spent on traded goods

Figures 4 and 5 illustrate the policy trade-off which can occur when the government responds to a commodity boom with an expenditure program intensive in its use of traded goods, but is then faced with a sudden decline in its revenue position when the boom wanes. Before the boom occurs ($t = 0$), the economy is operating at a point like A in Figure 2, where the nontraded goods market and the traded goods market are in equilibrium and where both internal (monetary and price stability) and external balance (trade balance) are achieved. It is assumed that $G_0 = R_0$.

Following the primary commodity export price boom occurring at $t = 1$, government revenues and, hence, expenditures rise. Assuming that $\lambda = 0$ and $\eta = 1$, ^{1/} that any incremental government revenue (expenditure) is spent on traded goods, and that $\gamma = 1$ (thus, the entire foreign exchange windfall which ends up in government coffers as tax revenue is recycled into purchases of traded goods), then the real exchange rate for which external balance is achieved remains unchanged. In such an instance, the external balance schedule is defined by:

$$\Delta IR = T^S(e) + Z_1 - T^d(e, n(e); \beta g + \Delta g) \quad (13)$$

where Δg is the incremental value of government purchases of traded goods, by assumption equal to ΔZ . Since the increased supply of foreign exchange resulting from the commodity boom ΔZ is absorbed by the expansion of government spending on traded goods (Δg), an excess supply of foreign exchange does not emerge. As a result, the equilibrium real exchange rate and hence the location of external balance schedule remains unchanged. In addition, since fiscal balance is also maintained, the internal balance schedule remains coincident with the

^{1/} It is assumed that $\lambda = 0$ and $\eta = 1$ in order to simplify the exposition which follows. Under these assumptions, expenditure growth will equal revenue growth and the budget will remain balanced. With $\lambda = 0$ and $\eta > 1$ ($\eta < 1$), expenditure growth will be greater than (less than) revenue growth, and the budget will move into deficit (surplus). More generally, using equations (8), (9), (10), and (11), it can be shown that $R_1 - G_1 = (1 - \eta)(R_1 - G_0) - \lambda \eta$.

external balance schedule. As a result, the small open economy remains at point A (Figure 2) while the boom is occurring. 1/

At $t = 2$, when the boom subsides, the internal and external balance schedules will diverge from one another. If foreign exchange receipts fall back to the level prevailing at $t = 0$ (i.e., $Z_2 = Z_0 < Z_1$) then the loss in fiscal revenues will result in a reduced level of expenditures; however, because of the asymmetry assumption, revenues fall by more than expenditures can be cut. As a result, a fiscal deficit emerges. 2/ The size of this deficit will depend on the value of the adjustment parameter η' . The closer η' is to 0, the larger will be the deficit. The closer η' is to 1, the smaller will be the deficit. 3/ Other things equal, η' will be closer to zero the more committed a government is to a development or capital program; the greater the political resistance to expenditure cuts; the greater the economic costs of cutting programs in midcourse; the longer the gestation period of new programs or projects initiated during the boom period; the more inflexible the expenditure structure, etc.

When foreign exchange receipts and hence fiscal receipts fall back to their initial levels, the government cannot fully cut back its expenditures on traded goods, a new (more depreciated) real exchange rate is required to maintain external balance. The new external balance schedule is to the right of the old one (Figure 4); at this higher real exchange rate e_1^* an increased (private) supply of traded goods plus a reduced (private) demand for traded goods allows the import requirements of the government to be met and trade balance equilibrium to be achieved.

The internal balance schedule, however, does not move, because price stability ($\Delta M = 0$) requires the same real exchange rate. When the commodity boom wanes, at the old equilibrium real exchange rate e_0 , the trade balance is in deficit by an amount equal to the new level of (incremental) government import demand g_2^* . This places a deflationary pressure on the money supply which is exactly offset by the

1/ In the previous case, the incipient trade balance surplus led to a rise in the nominal stock of money. As the nominal stock of money rose, so did the demand for traded goods (thus reducing the trade surplus) and the nontraded price level (thus causing an appreciation of the real exchange rate and a reduction in real money balances). This process continued until a new equilibrium was reached at a point like A' in Figure 3. In this case, however, the monetary consequences of the primary export commodity boom are in essence "sterilized" by the purchase of traded goods. The same result could be achieved by an accumulation of foreign assets or a reduction of public foreign debt, an option not considered in this paper.

2/ Using equations (8), (9), (10), and (11), the fiscal position that emerges at $t = 2$ is $R_2 - G_2 = (1 - \eta')(R_0 - C_1)$, which can be signed as negative (i.e., a deficit).

3/ This is true for subsequent years also.

Figure 4
Internal and External Balance: Post-boom Policy Conflict

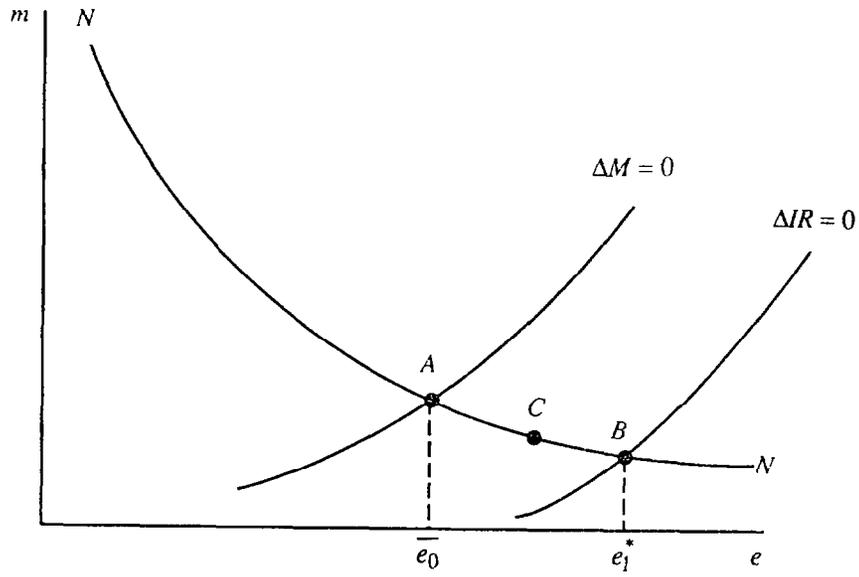
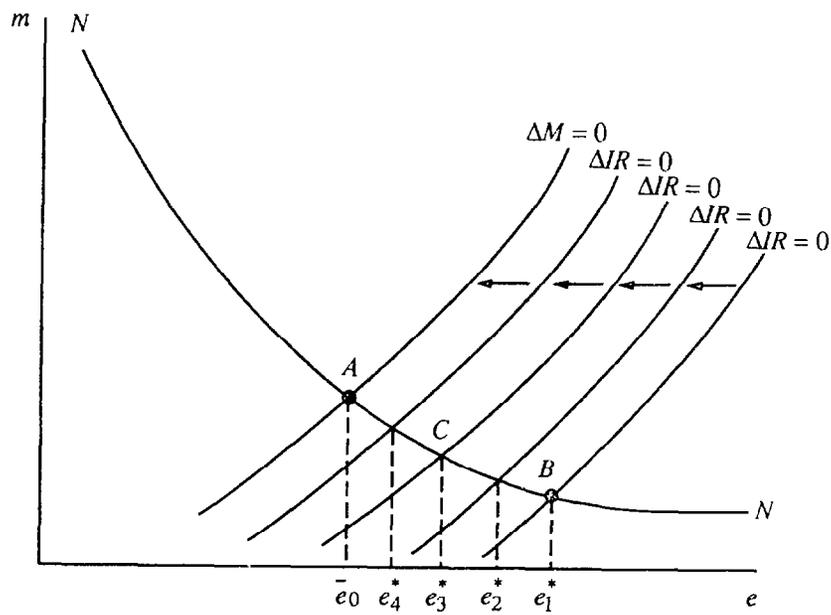


Figure 5
Internal and External Balance: Effects of Fiscal Adjustment



flow of credit to the government to finance its fiscal deficit. In other words, at \bar{e}_0 , the monetization of the fiscal deficit increases the money stock at the same rate that the drawdown of international reserves due to the trade balance deficit reduces the money stock. As such, at e_0 , the money stock and hence prices are stable.

Figure 4 thus illustrates the dilemma faced by policymakers. Given that an immediate fiscal correction may be difficult, a trade-off between internal and external balances exists. At point A, prices are stable, but the trade balance is in deficit. At point B, trade is balanced, but at the expense of inflation.

So long as the government successfully works to reduce its fiscal deficit to zero by cutting expenditure in each time period, the internal and external balance schedules will eventually coincide ^{1/} (Figure 5). However, the exact policy choice to attain these balances would depend on, among other things, the central bank's reserve position in the aftermath of the boom. When the boom wanes, the authorities may have a large enough reserve position to stay at a point like A in Figure 4, where price stability prevails but a trade balance deficit results in a rundown in reserves. For this to be feasible, the central bank's reserve position must be large enough to finance a sequence of (diminishing) trade balance deficits.

On the other hand, the central bank's reserve position may be inadequate to sustain the series of trade balance deficits. In this case, it may choose to devalue in order to move to a point like B in Figure 4. As a result, the government maintains trade balance equilibrium, but at the expense of inflation, with the rate of price acceleration depending on the size of the fiscal deficit. Each successive period, as the fiscal deficit contracts, the government can choose to maintain external balance by changing its exchange rate, for example, from e_1^* to e_2^* and then to e_3^* , etc. in Figure 5. Or, given the cut in its fiscal deficit, the government may choose to maintain the real exchange rate, despite the leftward shift of the external balance schedule, in order to rebuild its reserve position.

Of course, the government may choose to operate on neither the internal nor the external balance schedule. By operating at a point like C in Figure 4, the government can choose a real exchange rate which yields both inflation (though less than if the government were to maintain external balance at point B) and a trade balance deficit (though smaller than if the government were to maintain internal balance at point A). Such a choice might be opted for if reserves were just

^{1/} Each reduction of the fiscal deficit results in a leftward movement of the external balance schedule and in a new real exchange rate for which external balance is achieved. The internal balance schedule remains stationary throughout the process. The speed with which the two schedules will eventually coincide will depend on the value of η' .

high enough to spread the cut in government expenditures over a period of time, so as to balance the costs of inflation with the costs of a real devaluation, or if expectations existed that the commodity price bust might reverse itself.

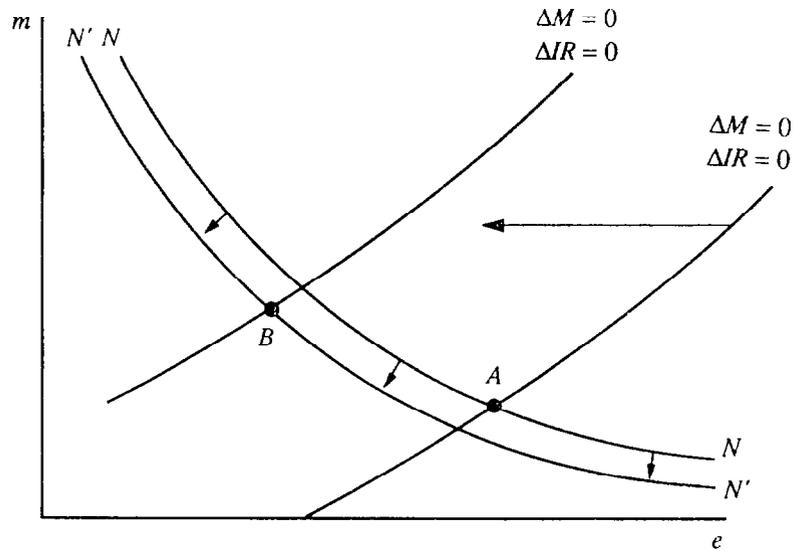
c. Windfall spent on nontraded goods

Figure 6 considers the case when the government responds to a commodity boom with an expenditure program intensive in its use of nontraded goods. Under the same assumptions as in the previous case (i.e., $G_0 = R_0$, $\lambda = 0$, $\eta = 1$, and $\gamma = 1$), a primary commodity export boom at $t = 1$ results in a leftward shift of the external balance schedule; that is, since foreign exchange earnings from the primary export commodities have risen, the real exchange rate for which external balance is achieved is now lower, that is, has appreciated. Compared to the previous case, the exchange rate appreciates because the windfall foreign exchange is not absorbed (or "sterilized") by government purchases of traded goods. The internal balance schedule also shifts leftward, and remains coincident with the external balance schedule, reflecting the fact that because $\eta = 1$ the budget remains in balance (since $\eta = 1$, then $\Delta D = 0$) during $t = 1$. The revenue windfall captured by the government and the government's utilization of this windfall on programs or projects intensive in their use of nontraded goods results, however, in an inward movement of the NN schedule. Because of the increased demand for nontraded goods, the price of nontraded goods must rise, resulting in this inward movement. Thus, a new equilibrium is established at a point like B in Figure 6 at time $t = 1$.

When the boom subsides at $t = 2$, the external balance schedule returns to its initial position, but the internal balance schedule will be located to the left of the external balance schedule. As in the previous case, the loss in fiscal revenue results in a reduced level of expenditure; but, because of the asymmetry assumption, revenues fall by more than expenditures can be cut. As a result, a fiscal deficit emerges. The internal balance schedule is thus located at an exchange rate at which the monetization of the fiscal deficit increases the money stock at the same rate that the drawdown of international reserves due to exchange rate overvaluation would decrease the money stock, so that $\Delta M = 0$. The cut in government expenditures and the subsequent reduction in overall demand for nontraded goods result in an outward shift of the NN schedule.

Because of the divergence of the internal and external balance schedules, government policymakers will again be faced with a trade-off between price stability and trade balance. However, so long as the government gradually reduces its expenditures on nontraded goods and hence the fiscal deficit, the internal and external balance schedules will eventually coincide, and the NN schedule will return to its pre-boom position. In this case, however, the cuts in the fiscal deficit result in a rightward movement of the internal balance schedule until it

Figure 6
Revenue Windfall Spent on Nontraded Goods



coincides with the external balance schedule (as opposed to the leftward movement of the external balance schedule in the previous case). Eventually, the pre-boom equilibrium will be restored.

IV. Country Experiences

The foregoing analysis suggests that a period characterized by policy trade-offs is likely to occur following a transitory commodity boom if a government raises expenditures in a manner inconsistent with its long-term revenue position. In the post-boom period, a government is thus faced with important macroeconomic choices related to the fiscal policy stance, the domestic financing of the fiscal deficit, the level and composition of expenditures, the external balance, the management of international reserves, and exchange rate management.

In this section, the commodity boom/bust cycles encountered in Sri Lanka (1977-78, 1984), Malaysia (1980-1982), and Kenya (1975-1977) are used to illustrate the revenue impact of the boom periods and the subsequent expenditure response, both in terms of the level and the composition of expenditures (capital versus current). The impact of the commodity boom collapse on revenues, the subsequent phase of fiscal adjustment, the use of other macroeconomic policy instruments, and the behavior of other macroeconomic aggregates are also discussed. Finally, the policy trade-offs during the disequilibrium phases are highlighted.

1. Sri Lanka

Sri Lanka's export structure is heavily biased toward agricultural primary products. Tea, rubber, and coconuts have accounted for the bulk of export earnings, exceeding one-half of the total in some years. Tea exports have dominated; in recent years, tea has generated over two fifths of total export earnings. This export structure, coupled with a fiscal system that is heavily dependent on export-related revenues, has made the Sri Lankan economy highly vulnerable to exogenous developments in the international commodity markets.

Between the mid-1970s and mid-1980s, the Sri Lankan economy has experienced two major commodity boom/bust episodes. The first episode began with a generalized boom in primary commodity prices during the 1977-1980 period. It started with an increase in export prices of tea in 1977, followed by a surge in prices of rubber in 1978-79 (Table 1). By 1980, coconut product prices had also increased sharply from the 1978 level. The second episode covers the sharp increases in prices of all three agricultural exports during 1983/84. In both cases, the transitory upswing in fiscal revenues led to rapid increases in government expenditures, but in the second case, expenditures were more flexible downward. ^{1/}

^{1/} In terms of the parameters of the model, η' was greater in the second episode than in the first. Furthermore, β appears to have been higher in the first episode than in the second.

Table 1. Sri Lanka: Export Unit Values
(1981 = 100)

	Tea	Rubber	Coconut Products
1976	31	30	...
1977	57	31	...
1978	97	67	65
1979	89	89	90
1980	95	97	104
1981	100	100	100
1982	99	81	80
1983	147	101	101
1984	218	119	171
1985	167	97	127
1986	123	108	89

Source: Review of the Economy, Central Bank of Sri Lanka.

a. Episode 1

The high level of international prices for agricultural exports during 1977-78, coupled with an adjustment of export duties in 1977 to capture the windfall gains, caused export duty revenues to surge to 10.3 percent of GDP in 1978 from 2.0 percent a year before (Table 2). 1/ Reflecting higher export duty rates as well as the impact of the trade liberalization of 1977 on customs duties and expansionary policies partly engendered by the boom, total revenues rose by 9.2 percentage points to 26.4 percent of GDP in 1978. 2/ In line with the easing of the commodity boom, export duty revenues returned to the pre-boom level in 1982 with a concomitant reduction in total revenues. 3/

A pronounced expenditure response followed the revenue increase. In 1978, total expenditure and net lending soared, rising by 17.1 percentage points to 40.3 percent; by 1982, this figure reached 42.4 percent, even as revenue performance had begun to slacken. The bulk of the increase was concentrated in current spending which rose by 10.5 percent of GDP in 1978 to 28.0 percent, spread almost equally between goods and services (in the form of higher wages and salaries) and current transfers and subsidies (by way of increased fertilizer and petroleum subsidies). Capital expenditures also increased, partly influenced by the new policies initiated in late 1977 to support ambitious development plans. Thus, the undertaking of new projects was facilitated by the increased availability of foreign aid and the fiscal windfall from the commodity boom. As a result, capital outlays rose, by 5.5 percent of GDP in 1978 to 11.0 percent, and continued to rise, reaching 16.6 percent of GDP by 1980. Within capital spending, a large proportion of the increase was traceable to capital transfers which tripled in relation to GDP to 6.1 percent in 1978. 4/

Because the expenditure response of the government, particularly pertaining to current expenditures, outpaced the revenue windfall, the central government budgetary deficit rose by 8.0 percent of GDP in 1978

1/ The unification of the exchange rate in late 1977 and the depreciation of the rupee also contributed to the revenue increase.

2/ As noted earlier, revenues in such instances are not generated solely by export duties, but also through the corporate income tax, personal income tax, etc., as well as through second-round effects of higher economic activity on tax revenues. It is virtually impossible to quantify the revenue impacts, both first- and second-round, of the commodity boom on these other taxes. However, in Sri Lanka, the bulk of the revenue increase appears to have been captured by export duties.

3/ Export duty revenues were also affected by a reduction in duty rates.

4/ The bulk of capital transfers are made to public agencies involved in infrastructural projects, such as irrigation, road construction, housing, water, and sewerage.

Table 2. Sri Lanka: Fiscal Finances

(In percent of GDP)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total Revenue	17.7	17.2	26.4	23.2	20.2	17.4	16.3	19.2	22.2	22.3	20.8
Export taxes	1.6	2.0	10.3	8.3	5.8	4.4	2.7	2.8	4.2	1.8	0.9
Total Expenditure and net lending	27.3	23.2	40.3	37.9	42.4	33.0	33.8	32.6	31.1	34.0	33.0
Of which:											
Current Expenditure	18.7	17.5	28.0	23.4	24.7	17.2	18.5	18.1	16.0	20.1	18.9
Capital Expenditure	8.1	5.5	11.0	13.7	16.6	13.2	15.6	13.1	13.0	13.3	13.0
Overall deficit (before grants)	-9.6	-6.0	-13.9	-14.7	-22.2	-15.6	-17.5	-13.4	-8.9	-11.7	-12.2
Domestic financing	6.4	2.5	4.7	7.5	13.8	6.8	9.3	5.6	2.6	5.1	5.1
Of which:											
Banking system	1.8	3.7	—	-1.4	...	1.7
External financing	3.2	3.5	9.2	7.2	8.4	8.8	8.2	7.8	6.3	6.6	7.1
<u>Memorandum items:</u>											
External current account, excluding grants (in percent of GDP)	-1.8	2.0	-4.5	-11.0	-19.7	-13.7	-14.9	-12.3	-3.3	-10.0	-9.3
Nominal exchange rate change (depreciation -)	-20.0	-6.0	-75.3	—	-5.8	-16.4	-8.3	-13.0	-8.1	-7.1	-2.9
Average inflation rate	1.4	1.1	12.2	10.8	26.0	18.0	10.8	14.0	16.6	1.5	8.0

Source: Government Finance Statistics and International Financial Statistics.

to 13.9 percent, and then further to 22.2 percent in 1980. ^{1/} Although dependence on domestic financing of the deficit remained low until 1978 in view of available foreign financing, reliance on domestic sources reached a record level of 13.8 percent of GDP in 1980. The resulting inflation of 26.0 percent offset a part of the 1977 exchange rate devaluation and caused the external current account to worsen to 19.7 percent of GDP in 1980 from 4.5 percent in 1978.

By 1981, a process of fiscal adjustment to restore macro-balances had begun, via the containment of current expenditures. Expenditures on goods and services, current transfers, and subsidies fell to levels prevailing during the pre-boom period. The fiscal deficit declined to 17.5 percent of GDP in 1982, with a substantial reduction in domestic borrowing by the government. However, unlike current spending, capital expenditures did not contract in the post-boom period and remained at twice the level of the pre-boom period, reflecting the continued availability of foreign funding for capital projects. Thus, the investment projects initiated in 1977/78 and facilitated partly by the revenue gains from commodity price increases could not be phased out with the ending of the commodity boom, leading to a long-term shift in favor of development expenditures. Nonetheless, the improvement of fiscal balances during 1982 contributed to the strengthening of the external current account and to lowering the rate of inflation.

b. Episode 2

Once again in 1984, there was an all-around increase in international prices of the three main agricultural commodities exported by Sri Lanka (Table 1). As a result, export duty revenues rose to 4.2 percent of GDP in 1984 from 2.8 percent in the preceding year; all of the export duty increase came from tea exports. The boom-led expansion in economic activity also increased revenues from other direct and indirect taxes. Consequently, total revenues rose by 3.0 percentage points in 1984 to 22.2 percent of GDP. Both the external and the internal balances improved; the external current account deficit fell to 3.3 percent of GDP from 12.3 percent a year before, and the overall fiscal deficit declined by 4.4 percentage points of GDP to 9.0 percent. A large net repayment by the government was made to the banking system, and inflation also eased.

The effect on expenditure was felt in the following year (1985), when total expenditures and net lending increased by 2.9 percentage points of GDP. Current expenditure rose by 4.0 percentage points of GDP as outlays on goods and services more than doubled with a near quadrupling of expenditures on defense and security, and the granting of a substantial increase in wages and salaries to the civil service. On this occasion, capital expenditure did not grow and exhibited relative

^{1/} As noted above, the increase in the deficit reflected in part an expansion of capital expenditure driven by an increased availability of foreign financing.

stability. As the commodity boom began to wane in 1985, export duties declined substantially; however, this revenue loss was offset by higher taxation of imports (including raising of the turnover tax). With the growth of expenditures, the overall deficit widened to 11.7 percent of GDP.

In 1986, total revenues declined by 1.5 percent of GDP, as export duties on tea dropped by 0.9 percent of GDP following a 26 percent decline in tea prices. However, the cut in total expenditures and net lending, by 1.0 percent of GDP, suggests that the expenditure program initiated in response to the temporary revenue gain was relatively flexible. Thus, in this instance, the structure of expenditures did not undergo any long-lasting change. By 1986, the overall fiscal and external current account deficits stood at 12.2 percent and 9.3 percent of GDP, respectively, lower than or in the range of the levels prevailing in 1983.

Two broad conclusions emerge from the Sri Lankan experience. First, current expenditures exhibited much greater variation in response to exogenous movements in export prices. Second, capital expenditures were rigid downward in the short run, attaining a higher level during the first episode--a shift that was sustained even after the boom had subsided.

2. Malaysia

Exports of rubber, tin, logs and timber, crude oil, and palm oil constituted three fifths of total Malaysian foreign earnings in the early 1980s. Among the primary commodities, production and export of crude oil has been significant, forming around one fourth of both total export earnings and fiscal receipts. Thus, Malaysian export receipts and fiscal revenues have depended heavily on external demand and international price movements of primary commodities.

Following the sharp increase in world prices of petroleum in 1980 (Table 3), the contribution of petroleum taxes to revenue increased by about 3.0 percent of GDP in 1980 (Table 4). Total revenues increased by 4.0 percentage points to 26.4 percent of GDP. ^{1/} With continuing increases in prices, petroleum revenue peaked at 9.3 percent of GDP in 1982. Total expenditures and net lending rose by even more, increasing by 6.7 percentage points to 32.3 percent of GDP in 1980, and peaked at 42.7 percent of GDP in 1982--an increase of about 17 percentage points of GDP from the 1979 level.

The initial impact of the oil price increase on current expenditures was limited. These rose by 1.0 percent of GDP to 19.2 percent in 1980. In 1981 and 1982 this changed--as current spending increased to

^{1/} In Malaysia, oil revenues are collected in the form of income taxes, export taxes (imposed for the first time in 1980), royalties, and dividends.

Table 3. Malaysia: Export Unit Values

(1985 = 100)

	1979	1980	1981	1982	1983	1984
Sawn logs	127.6	122.4	110.2	124.1	106.2	117.3
Palm oil	106.0	94.0	92.2	79.4	82.8	124.3
Petroleum	67.7	115.1	131.4	123.8	106.6	102.0

Source: International Finance Statistics.

Table 4. Malaysia: Fiscal Finances
(In percent of GDP)

	1979	1980	1981	1982	1983	1984
Total revenue	22.5	26.4	27.5	26.6	26.6	25.8
Petroleum revenue	2.2	5.3	8.7	9.3	7.4	8.3
Total expenditure and net lending	25.6	32.3	42.4	42.7	36.3	32.3
Of which:						
Current expenditure	18.0	19.2	23.8	25.5	23.1	22.1
Development expenditure	4.5	9.9	15.4	11.2	8.2	5.4
Overall deficit, excluding grants	-3.1	-5.9	-14.9	-16.2	-9.7	-6.6
Domestic financing	1.6	5.4	10.7	8.3	3.2	2.6
Of which: Banking system	-0.5	2.0	1.0	...	2.8	...
Foreign financing	1.4	0.6	4.2	7.8	6.5	4.0
<u>Memorandum items</u>						
External current account (As percent of GDP)	4.3	-1.3	-10.0	-13.5	-11.7	-5.0
Real effective exchange rate percentage change (depreciation -)	2.6	-3.7	0.4	6.3	4.8	3.9
Average annual inflation rate	3.6	6.7	9.7	5.8	3.7	3.5

Source: Government Finance Statistics and International Financial Statistics.

23.8 and 25.5 percent of GDP, respectively. The bulk of the expansion was attributable to a surge in outlays on goods and services, partly reflecting the 1982 wage award for government employees; the remaining increase was to accommodate higher subsidies and current transfers.

The revenue surge had a greater impact on capital (development) spending. 1/ Consistent with the authorities' desire to accelerate implementation of the final year of the Third Malaysian Plan and the first year of the Fourth Plan, capital spending more than doubled to 9.9 percent of GDP in 1980, rising further to 15.4 percent in 1981. Almost all of the increase in capital expenditures took the form of higher capital transfers.

On account of higher spending, the overall fiscal deficit widened from 3.1 percent of GDP in 1979 to 5.9 percent in 1980, reaching a high of 16.2 percent in 1982. A large part of the fiscal deficits were financed domestically during 1980-82. Despite increasing reliance on foreign financing, the inflation rate almost reached double digits in 1981. The external current account also deteriorated sharply from a surplus of 4.3 percent of GDP in 1979 to a deficit of 13.5 percent in 1982, and the real effective exchange rate appreciated--more than offsetting the initial depreciation of 1980.

By 1982, both the overall fiscal and the external current account deficits had become unsustainable. This prompted the authorities to scale down total expenditure and net lending by around 6 percent of GDP in 1983; the relatively larger burden of fiscal adjustment fell on development expenditure. In the current component of the spending, both outlays on goods and services and subsidies and transfers were affected. The process of fiscal retrenchment continued in 1984, supported by further cuts in capital expenditures of 2.8 percent of GDP. This brought the overall fiscal deficit in 1984 down to 6.6 percent of GDP, close to the average level prevailing during 1975-78, with a concomitant favorable impact on the inflation rate. The external current account deficit also fell from a high of 13.5 percent of GDP in 1982 to 5.0 percent in 1984.

In the case of Malaysia, the decline in revenues after the fall in commodity (petroleum) prices was not as sharp as in Sri Lanka, principally because volume increases in petroleum exports partially nullified the impact of falling prices. However, the Malaysian case shows that the oil price boom actually resulted in an expenditure increase that was disproportionately larger than the initial stimulus to revenues. 2/ Since the emerging external and internal balances were not sustainable, the authorities resorted to pruning both current and capital expenditures. In the aftermath of the boom, development expenditures in relation to GDP returned to their pre-boom levels, whereas current

1/ Indicating that the parameter β was relatively high in this case.

2/ In terms of the model, this indicates a value for the parameter η ($= \eta' + \eta''$) in excess of unity.

expenditures remained above pre-boom levels, resulting in a change in the structure of expenditures.

3. Kenya

Coffee and tea occupy a prominent position in Kenya's exports; in the late 1970s, the contribution of these commodities to total export earnings ranged between one third to three fifths. A generalized commodity boom in the late 1970s also affected Kenya's budget and external current account.

In the wake of the Brazilian frost in 1975, the average export price of Kenyan coffee quadrupled during 1975-77 (Table 5). The coffee price increase was accompanied by a rise in tea prices, which increased by over 100 percent, though mostly in 1977. Supported by large volume increases, the value of Kenyan exports of coffee and tea peaked in 1977; their share in total exports rose to three-fifths. Most of the boom's impact on budgetary revenues was indirect, through the effect of higher export earnings on income, and of the latter, on imports. The direct effect on revenue was less significant--although in 1977/78 an export tax on coffee and tea was introduced to capture a part of the price increase gains. Against this background, total revenue increased by about 5 percentage points of GDP to 23.4 percent in 1977/78 (Table 6). Most of the incremental revenue stemmed from import duties (about 2.0 percent of GDP). 1/ The newly instituted export tax generated 0.4 percent of GDP, and revenue from taxes on income and profits rose by nearly 1.0 percent of GDP. Reflecting in part the income effects of the export boom, collections from taxes on goods and services also increased.

Large revenue increases in 1977 gave impetus to increases in current spending which included outlays on establishing Kenyan corporations to provide economic services following the breakup of the East African Community (EAC), and on defense. 2/ This raised total expenditures and net lending in 1977/78 by about 5 percent of GDP to 28.1 percent--by almost 3 percentage points of GDP in the recurrent component. Capital expenditures, on the other hand, rose modestly by only 0.6 percent of GDP. Despite a large jump in expenditures, the overall budget deficit, excluding grants, in 1977/78 remained at the level of the preceding year of about 5.0 percent of GDP because of

1/ A part of the increase in 1977/78 import duties was attributable to inclusion of certain import duties that were previously assigned to East African Community (EAC) before its breakup to finance regional activities.

2/ In this case, it is difficult to establish the relative magnitude of β . On the one hand, current outlays used to establish corporations likely had a low traded-goods component. On the other hand, current defense expenditures may have had a high traded-goods component.

Table 5. Kenya: Export Unit Values

(1985 = 100)

	1975	1976	1977	1978	1979	1980	1981	1982
Coffee	23.6	54.4	98.3	66.3	63.8	62.3	56.3	66.3
Tea	28.6	35.2	67.2	48.9	43.9	43.0	53.1	57.9

Source: International Financial Statistics.

Table 6. Kenya: Fiscal Finances

(in percent of GDP)

	1976/77	1977/78	1978/79	1979/80
Total Revenue	18.6	23.4	22.7	24.1
Import duties	3.2	5.3	4.7	4.2
Export duties	--	0.4	0.2	0.3
Taxes on income and profits	6.5	7.3	7.0	7.0
Total Expenditure and net lending	23.3	28.1	30.3	29.8
Of which:				
Current expenditure	16.7	19.5	21.7	21.3
Capital expenditure	5.2	5.8	5.9	6.4
Overall Deficit, excluding grants	-4.7	-4.6	-7.6	-5.7
Domestic Financing	2.6	3.0	4.4	2.3
Foreign Financing	2.1	1.6	3.2	3.4
<u>Memorandum items</u>				
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
External current account, excluding grants (As percent of GDP)	-4.6	-0.8	-13.8	-9.5
Nominal exchange rate change (depreciation -)	-13.9	1.1	6.6	3.3
Average annual inflation rate	11.3	14.8	16.9	8.1

Source: Government Finance Statistics, IMF.

a strong revenue performance. The deficit in the external current account fell to less than 1 percent of GDP in 1977. ^{1/}

The favorable external developments, however, turned around in 1978, as export prices of both coffee and tea declined; the price fall continued into 1979. By 1980, the share of coffee and tea in total exports had fallen to one third, though it was higher than the level prevailing in 1975. The fall in commodity prices lowered total revenue by around 1 percent of GDP in 1978/79; the decline was concentrated in export and import duties, and taxes on income and profits.

Discretionary tax measures, totaling 0.7 percent of GDP, included in the 1978/79 budget, failed to offset the revenue decline arising from the waning of the commodity boom. Expenditures, on the other hand, continued to increase, rising to 30.3 percent of GDP, with all of the increase concentrated in the current component. Rising domestic demand caused the external current account to worsen to 13.8 percent of GDP in 1978. The domestic financing of the fiscal deficit also shot up to over 4 percent of GDP, causing an acceleration of inflation in 1978 to 16.9 percent. The internal and external positions improved in 1979/80 when total expenditure in relation to GDP was contained at the previous year's level, and revenues increased with the implementation of large discretionary tax measures amounting to 1.4 percent of GDP. Despite this fiscal adjustment, recurrent outlays as a ratio of GDP in 1979/80 had reached a level higher than in 1976/77.

In the Kenyan case, revenues did not contract following the easing of the commodity boom; rather, they were sustained at the higher level by the implementation of discretionary revenue measures which yielded more than 2 percent of GDP over the two-year period. The bulk of the increased spending was in the recurrent component. ^{2/} Furthermore, these increases showed relative irreversibility after the price boom subsided, with a long-term impact on Kenya's expenditure structure.

IV. Conclusion and Policy Implications

Building on an assumption of asymmetric government expenditure behavior in response to a windfall revenue gain occasioned by a transitory commodity boom, the model developed in the paper illustrates the transitional dynamics of a stylized economy during a boom period and the nature of the macroeconomic disequilibria which emerge in the post-boom period. The disequilibrium phase is characterized by a macro-economic policy trade-off between internal (monetary and price stability) and external (trade) balance. While the restoration of macro-equilibrium fundamentally requires a progressive reduction of the fiscal deficit, government policy makers can choose among many

^{1/} The fiscal year runs from July to June, while the balance of payments data covers a calendar year.

^{2/} This conclusion is consistent with a study conducted by Bevan, Collier and Gunning (1989).

alternative paths (and speeds) back to equilibrium. This choice depends on the types of expenditures engendered by the boom in the first place, how quickly these expenditures can be reduced, the level of international reserves when the boom wanes, and the political and economic costs of inflation and devaluation, among others.

The three country cases discussed in the paper support the basic assumption underlying the model; expenditures indeed move in response to a short-term improvement in the terms of trade. The ensuing expenditure increase is followed by a worsening of both the fiscal deficit and the external current account, accompanied by a high rate of inflation, when the boom wanes. The restoration of the macroeconomic equilibrium takes some years because of the downward rigidity of expenditures.

Other policy implications can also be drawn from the country studies. The nature of the expenditure increases, following the commodity price rise, is not uniform across countries. In Malaysia and Sri Lanka, the price increases led to an expansion in both recurrent and capital expenditures. In Kenya, on the other hand, the expenditure increase was almost wholly confined to recurrent spending. However, a country's preference for certain types of expenditure is not permanent, as indicated by the Sri Lankan case. In the first episode, the expenditure increase was both in the recurrent and capital components, while in the second instance, only recurrent spending was affected.

Fiscal adjustment in the aftermath of the boom is also not uniform. In Malaysia, the macro-adjustment entailed cutting capital expenditures to their pre-boom level. By contrast, in Sri Lanka, capital spending maintained its higher level even in the post-boom period. The differences in adjustment paths adopted are reflected in the emerging structure of expenditures in the post-boom period; after the first episode in Sri Lanka, there was a pronounced shift toward capital expenditures, whereas in Malaysia and Kenya, it was recurrent expenditures that reached higher levels.

The longer-term fiscal impact of a "permanent" increase in expenditures depends on its type. Implementation of new capital projects creates demand in the future for operations and maintenance expenditures. Capital expenditures on the creation of infrastructure facilities enhance the productivity of the private sector, thereby broadening the tax base. Higher outlays on wages and salaries--when resulting from additional employment--may be more difficult to reverse in the future than an increase in wage rates. Similarly, the granting of new or higher subsidies in the wake of a stronger revenue position becomes difficult to sustain once revenues return to their long-run path.

While the paper does not deal with policies that should be followed in such circumstances, some observations on appropriate policies can be made. In general, countries affected by short-term fluctuations in commodity prices tend to have weak reserve positions. Building up of

foreign exchange reserves to counter any downward movement in commodity prices would thus appear to be a prudent policy. ^{1/} Such an approach would be consistent with a policy of stabilizing expenditures in the face of fluctuating revenue. ^{2/} Under this policy rule, variations in revenues are reflected in movements in the fiscal balance. The alternative option of maintaining the fiscal balance at a constant level in anticipation of expenditure adjustment may not be possible because of the observed asymmetry and the impact that certain types of expenditure have on prospective expenditures. The policy of stabilizing expenditure may, however, not be easy to implement for reasons discussed in the beginning of the paper. Further, as noted earlier, expenditure control mechanisms may be weak and hence may be unable to deflect pressure from different ministries to increase spending at the time when the revenue position is strong. Thus, a tightening of the expenditure control and monitoring mechanism may be a crucial precondition in the short run for restraining expenditure increases in a country experiencing a sudden rise in the prices of its export commodities.

^{1/} A similar view is taken by Cuddington (1988) in his study of 11 countries that experienced commodity booms in the 1970s and 1980s.

^{2/} See Chu (1988).

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