MACROECONOMIC CONSTRAINTS AND MEDIUM-TERM GROWTH IN KENYA: A THREE-GAP ANALYSIS

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CONSORTIUM POUR LA RECHERCHE ECONOMIQUE EN AFRIQUE

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Macroeconomic constraints and medium-term growth in Kenya: a three-gap analysis

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Abbreviations

BOP   Balance of payments
DCP   Domestic credit to the private sector
ICOR   Incremental capital-output ratio
ISI   `   Import substitution industrialization
KMEPMODL Macroeconomic policy model for Kenya
CGE   Computable general equilibrium model of the Kenyan economy

I Introduction

Since the early 1970s, the growth performance of Sub-Sahara Africa has been poor. The per capita growth rate, for example, declined from 1.7% in 1965-73 to 0.6% in 1973-80 and to -3.1% in 1980-89, although this varied considerably across countries. One major cause of this disappointing performance has been the large macroeconomic imbalances which have characterized these countries. To reduce these financing gaps, many countries have implemented structural adjustment and contractionary stabilization programs which have had, in some cases, a negative impact on economic growth by squeezing investment. There is therefore a need to identify and implement macro policies compatible with better economic growth performance, at least in the medium term (Khan and Villanueva, 1991).

In 1986, the Kenyan Government published a sessional paper, *Economic Management for Renewed Economic Growth*. This paper argued that if Kenyans were to enjoy an improvement in their living standards, it was imperative that economic growth become the primary concern of economic policy and that the rapid growth rates experienced in the 1960s be restored and sustained. This was to be brought about by the implementation of appropriate policies, particularly those that alleviate saving, fiscal, and foreign exchange constraints. The sessional paper therefore explicitly identified large resource gaps as important constraints on economic growth.

Since independence in the early 1960s, the country has been able to maintain a high level of investment, much of it financed from domestic savings. The savings-investment gap has, however, expanded over time – from about 3.2% of GNP in 1965-69 to 6% in the 1980s – thus the country has come to rely increasingly on external resources to finance its capital formation. A cutback in the availability of net foreign capital inflows is therefore likely to have a negative effect on economic growth, while the high dependence of external capital inflows results in large outflows of investible resources in the form of debt repayments.

A major cause of the widening savings–investment gap has been the large budget deficits incurred by the public sector. The overall budget deficit increased from 4.9% of GDP in 1969-73 to 9.4% in 1979-83 and was about 5.0% in 1989-

90. The sessional paper, therefore, advocated a reduction of the fiscal deficit to 'control inflation, restrain public indebtedness, increase Government savings and avoid crowding out private investors who need access to domestic credit' (*ibid.*, pp. 18-19). The persistence of large budget deficits was attributed to excessive expansion of ministry expenditures, mainly in the recurrent account, and an inelastic tax system. The paper therefore called for tax reform to increase the tax revenue/GDP ratio and a restriction of government expenditure to reduce the budget deficit to about 2.5% of GDP by the year 2000.

The sessional paper similarly argued that the foreign exchange gap has widened as the 'demand for imports to fuel growth ... outstrips the growth of export revenues and the supply of foreign capital' (*ibid.*, p. 20) thus limiting the rate at which the economy can grow. Kenya, like many non-oil less developed countries (LDCs), requires increasing amounts of imports which it cannot produce itself, such as capital goods, certain intermediate goods and many raw materials, especially oil. The import substitution industrialization (ISI) strategy that the country has pursued in the past has not reduced the demand for imports and may have exacerbated it by changing the composition of imports towards the more essential types. To pay for these imports a country must increase export earnings and seek more foreign capital. In the 1970s, for example, the index of real commodity imports declined from 132 to 96 compared to the increase in the real GDP index from 87 to 133. This was partly caused by a decline in real commodity exports whose index declined from 98 to 90, although this was partially compensated by an increase in net non-factor service exports such as tourism and transportation whose index rose from 83 to 142. The share of commodity imports financed by foreign savings increased from 13% to 29% in this period.

The story was not much different in the 1980s. The shortage of foreign exchange has therefore become a major problem, with the economy increasingly dependent on external funds to finance imports. The sessional paper therefore advocated a more aggressive export promotion drive, as well as efficient import-substitution in agriculture and industry. It set a target exports growth rate of 5% per annum, which was well beyond the country's past export performance.

This paper uses a simple analytical framework to study whether it is savings, the budget or the foreign exchange gap which is the binding constraint on capacity growth in Kenya and how these gaps have evolved in the 1970s and 80s. When all the three gaps have increased over time it is not obvious which one would be binding. In a two-gap study of Sudan for example, El-Shibly and Thirlwall (1981) found that the foreign exchange and savings gaps were roughly of equal magnitude, so that policies to increase domestic savings were as important as policies to augment foreign exchange. This paper therefore analyzes the extent to which the availability of foreign exchange (and the associated import compression) has

evolved to become the binding resource constraint to economic growth controlled for capacity utilization as hypothesized by the Kenyan Government's 1986 sessional paper. We also examine whether policies in the 1989/93 development plan help bridge the binding gap.

The three-gap framework applied in the study extends the traditional two-gap model mainly associated with Chenery (1967) by distinguishing the fiscal constraint as another potentially important impediment to economic growth independent from the savings constraint (Bacha, 1990). The analysis draws heavily on the methodological framework by Taylor (1989; 1990).

One component of this methodology especially links the growth problem to shortages of intermediate imports with the adverse impact of this on capacity utilization, investment and economic growth (Rattso, 1989). Gap analysis of course assumes that the incremental capital-output ratio (ICOR) and other behavioral parameters are fixed at least in the medium-term and that there is limited substitution between domestic and foreign resources.

Section II in this paper presents a brief background analysis of the Kenyan economy and macroeconomic policies in the 1970s and 80s. Section III presents the methodological framework, while Section IV parameterizes and presents a growth programming analysis of the three gaps and their evolution. Section V undertakes some counterfactual growth programming incorporating changes and government forecasted scenarios in the course of the stabilization and structural adjustment of the economy. The paper is concluded in Section VI.

II The Kenyan economy and macroeconomic policies in the 1970s and 80s

Kenya is a primary producing country with population of 24 million and an average GDP per capita of about US$370 in 1990. The agricultural sector contributed an average 25.1% and the manufacturing sector an average 11.0% to GDP in 1984-88 (most of this in the processing of agricultural products). The economic structure has not changed a lot since independence. A decline in the share of the agricultural sector (from 39.3% of GDP in 1964-68) and a relatively constant manufacturing sector (9.8% of GDP in 1964-68) has been compensated by an increased role of the service sector in the economy.

The economy is also very open and the commodity trade ratio (imports plus exports as a proportion of GDP) comprised an average 43% in 1984-88, from 46.4% in 1964-68. Coffee, tea and sisal are the dominant commodity exports. Tourism and petroleum products are also important sources of foreign exchange,[1] even though the latter's contribution to foreign exchange earnings is small, with the country exporting imported petroleum products after processing. Other manufactures contribute very little to export earnings, with manufactured exports comprising about 10% of total exports.

The openness of the economy and the heavy reliance on a few primary products implies that the country is highly vulnerable to exogenous shocks that influence its earnings in the international markets. Some studies therefore have found a close correlation between terms of trade and the real growth of the economy (Vandemoortele, 1985).

In the first decade of independence (1964-73), the country performed very well, with the real GDP registering an average annual growth rate of 6.5%,[2] the agricultural sector an average rate of 4.2% and the manufacturing sector an average rate of 8.2%. This rapid growth rate was mainly a product of land reform, in which land was subdivided from large to small holdings which were cultivated more intensively; extension of the area under the cultivation of high value cash crops; and industrialization based on the import-substitution strategy[3] Another important source of growth was the ability of the economy to sustain high levels

of saving and investment. Since 1965, gross investment has comprised more than 19% of GNP, with much of this financed from domestic savings.

The ISI strategy pursued in the first decade of independence had a drastic impact on the structure of imports. The share of consumer imports declined from an average 25% of total imports in 1964-68 to about 16% in 1974-88, while the share of intermediate and capital imports rose from 75% of total imports in 1964-68 to about 84% in 1974-88. This has made the demand for imports relatively inelastic, making the economy vulnerable to unexpected reductions in the supply of foreign exchange.

Other macroeconomic indicators during 1964-73 also indicated a healthy economy. For example, the country experienced a low average rate of inflation of only 3.4%, the external reserves exceeded the legally stipulated four-months worth of imports, the current account deficit was modest and was more than compensated by net long-term capital inflows, hence the basic balance was positive.

Since then, the economy has not performed as well, registering a lower average real growth rate of only 4%, a higher average inflation rate of 11% and a worsened external account in 1974-90. Foreign exchange reserves have been less than the stipulated four months' worth of imports in much of the period, while the current account deficit has been large and could not be compensated by long-term net capital inflows.

Deterioration in economic performance can be traced to various adverse exogenous developments, inappropriate fiscal and monetary policies, especially in the early and late 1970s, and domestic structural factors, especially the failure to expand and to diversify exports. Exogenous developments include the oil crises of 1973-74 and 1979-80 and the consequent world recession; increased protectionism in developed countries; high external interest rates and a decline in concessionary capital inflows; the droughts of 1974-75, 1979-80 and 1983-84 which adversely affected agricultural production and led to massive food imports; the breakdown of the East African Community in 1977 which significantly eroded the market for Kenya's non-traditional exports; and a military coup attempt in 1982 which adversely affected investment and caused some capital flight. By the end of the 1970s, economic observers were generally agreed that Kenya needed to institute major structural policy changes to stabilize the economy and to restore a reasonable rate of economic growth in the changed domestic and increasingly hostile international environments.

Overall the country has experienced a serious decline in the terms of trade (TOT), with the TOT index declining from 114 in 1974-78 to 76 in 1989-90. One consequence of this decline has been severe import compression, particularly in the first half of the 1980s. The situation improved somewhat in the second half of the 1980s, mainly due to an increase in net external capital inflows in return for

the successful adoption of adjustment policies financed mainly by the international financial institutions (IFIs) and due to a temporary decline in oil prices and an improvement in coffee prices in the mid-1980s. These deteriorated later, however, with oil prices increasing by 77% and coffee prices declining by 37% between 1986 and 1990.

As explained above, Kenya did not experience a major balance of payments (BOP) problem in the 1960s and therefore did not seek high conditionality loans from IFIs. The country experienced its first major external payments problem in 1971 when there was a drastic rundown of reserves following an experiment in expansionary fiscal policies followed by the Organization of Petroleum Exporting Countries (OPEC) oil crisis of 1973-74. The Government reacted to these crises by tightening the trade regime and seeking external finances whose general policy conditionalities were spelt out in official documents such as the *1974-78 Development Plan* and the *1975 Sessional Paper No. 4 on Economic Prospects and Policies*.[4] Since then the country has used direct controls to ration foreign exchange earnings.

These and subsequent documents contained comprehensive policies to restructure the economy with a view to making it efficient, competitive and adaptable to shocks to enhance its growth potential. Economic growth was to be enhanced mainly by the liberalization of the economy to make it more market-oriented and by increasing the productivity of the public sector.

The International Monetary Fund (IMF) programmes adopted in the early 1970s were abandoned when the country experienced an improvement in the BOP resulting from a large increase in the prices of coffee and tea in 1975-77 caused by a frost in Brazil that drastically reduced its coffee harvest. As a consequence of the boom, the price of coffee quadrupled and tea more than doubled, leading to a six-fold increase in coffee exports and a three-fold increase in tea exports. The proceeds of this boom were not sterilized and were fully passed on to the farmers. The resulting expansion in aggregate demand (which coincided with the second oil crisis of 1979-80) produced a serious balance-of-payments crisis beginning in 1978, during which a restrictive trade policy was used to try to contain the situation. The external account problems again forced the country to seek loans from IFIs whose general conditionalities were published in the *1979-83 Development Plan* and in the *1980* (and *1982*) *Sessional Paper No. 4 on Economic Prospects and Policies*.

These structural adjustment policies (SAPs) were continued and incorporated in subsequent five-year development plans published in 1984 and 1989 and in other official documents, particularly the *1986 Sessional Paper on Economic Management for Renewed Growth*. Even though the IMF programmes negotiated in 1979-82 all collapsed because the stipulated credit ceilings were exceeded, the

Government was able to successfully implement later programmes and has had programmes with the IMF since then, except in 1986-87. The 1980s are therefore a period when the country attempted fairly sustained stabilization, structural adjustment and economic liberalization efforts.

In this process, Kenya received large external capital inflows for the financing of imports and as a consequence incurred a large external debt burden. The ratio of external debt to exports increased from 38.2% in 1974 to 162.9% in 1987. The external debt service charges, which were 3.0% of export earnings in 1974, now (1993) comprise about a third of export earnings. External debt servicing has become one of the most critical issues that must be addressed if the growth of the economy is to be stimulated and sustained.

To encourage competition in the domestic industry and to create an enabling economic environment for the operation of market forces, price controls have been gradually lifted – particularly for non-essential consumer and producer commodities. This has been accompanied by the easing of non-price restrictions in the grain market, especially monopoly buying and distribution for such crops as maize. In the private sector, monopolistic practices are to be curtailed – a Monopolies and Restrictive Practices Act was passed by Parliament in 1990.

To make the industrial sector more competitive, the protection accorded the sector has been lessened through a reduction in import tariffs and by a systematic dismantling of quantitative restrictions on imports. The Foreign Investment Protection Act has recently been amended to encourage foreign investors, while action has been taken to cut the red tape in the investment approval procedure. The Investment Promotion Centre was established in 1986 to serve as a one-stop centre to assist potential investors through its Green Channel facility.

A number of incentives have been provided to exporters, especially of non-traditional products. These include an export compensation (subsidy) scheme for manufactured exports, in existence since 1974; manufacturing under bond; and export processing zones. A crawling-peg exchange rate policy has been in existence since the early 1980s. A large potential exists for increasing the exports of such non-traditional items as horticulture which improve the viability of the Kenyan balance of payments.

Other sectoral structural adjustment policies cover agriculture and the financial sector. Agricultural adjustment programmes mainly involve raising producer prices to induce farmers to increase output especially of foodstuffs. The producer prices are usually reviewed every year, just before the planting season, to ensure timely input supplies and the provision of adequate agricultural credit. In the financial sector, the central bank's supervisory role over commercial banks and non-bank financial intermediaries has been strengthened and policies to promote saving and investment adopted. In the money and capital markets, measures such as the

creation of discount markets and the strengthening of the stock exchange will improve the supply of long-term credit and equity.

The structural adjustment programmes also cover public investment. New procedures and institutional mechanisms have been initiated, mostly through a budget rationalization programme started in 1986. The objective is to contain the growth in government expenditure and to reduce the budget deficit. Through this programme, the Government would identify high-priority projects for additional funding and speedier implementation; postpone or cancel low priority projects; and ensure that recurrent resources are available in the future to operate and maintain completed priority projects and generally to improve the utilization of completed facilities. New projects will be funded only if they pass stringent tests of high productivity and cost effectiveness.

The budget deficit was to be reduced through an increase in government tax revenue and appropriations-in-aid. Tax revenue was to be increased via improvement of tax administration and gradual reform of the tax structure. Non-tax revenue was to be boosted by the policy of 'cost-sharing', the charging of some fees for the services provided by the public sector, most notably in education and health. Since 1986, the Kenyan Government has undertaken a Tax Modernization Programme that has somewhat broadened the government revenue base and increased the elasticity of the tax system. This has entailed changes in tax rates, tax bands and coverage of taxation, as well as the revamping of the major collection departments, especially through computerization of routine tasks and tax revenue data. Through the programme, tax departments have been strengthened by staff training and technical assistance. This has facilitated administration through an improvement in procedures and organization. These fiscal reforms have encompassed other broader policy objectives, such as an improvement in the rural–urban balance and have helped local producers to become more competitive domestically and internationally.

Monetary policy in Kenya aims at containing inflation while ensuring adequate credit supply consistent with a viable BOP situation. The principal monetary aggregate in the pursuit of this policy is M_2 – currency outside banks plus commercial bank deposits. The growth in M_2, for example, decreased from 21.4% in 1974-88 to 9.6% in 1979-83 and to 12.5% in 1984-88. The Government is trying to curtail its borrowing from the domestic banking system – which has comprised about 1.5% of GDP since the mid-1970s – in an effort to pre-empt the financial crowding-out of the private sector.

In order to encourage the mobilization of savings, discourage unproductive investments and to contribute towards financial stability, it is official policy to keep interest rates positive in real terms. Given a fairly high rate of inflation, this necessitates the maintenance of equally high nominal interest rates. As a

consequence, the real deposit rates, which were less than -7.0% in the 1970s, have been increased to -0.8% in 1981-85 and to 2.3% in 1986-90. Interest rates were fully freed from administrative controls in July 1991. Interest rate liberalization has been accompanied by a restructuring of the institutional framework within which commercial banks and non-bank financial institutions operate. The investment climate is being made more attractive, particularly for foreign investors, who provide about a third of the investment finance.

III Methodological framework

Following the Government's own growth programming, average ICOR (which of course shifts from year to year) is used to estimate the amount of investment required to achieve a given rate of economic growth in the medium-term. While the investment rate in Kenya has stayed fairly high, the average rate of economic growth has faltered. To allow for changes in capacity utilization, let Q be potential output in year t – the highest value of actual output (X) which can reasonably be produced within the existing capacity. If g stands for the potential growth of Q, then economic growth in the medium-term can be assumed to be roughly proportional to the gross investment ratio, i (= I/Q), or

(1) $$g = ki$$

Investment comprises gross fixed capital formation and inventory investment. Inventory investment is influenced by factors such as demand, import licencing policies and practices, credit constraints, inflationary expectations and the growth in GDP. Adjustment policies effects are assumed to counteract one another to leave inventory investment and ICOR fairly stable (Kenya, 1989).

Total investment is decomposed into private investment, i_p, and public investment, i_g, both normalized by Q. It is assumed that one of the important determinants of private investment is the capacity utilization in the economy. Investors will not undertake much capital formation in a depressed economy, with investment expected to rise with the degree of capacity utilization. Many investors also rely on self-finance. With many investment projects lumpy or indivisible, investors have first to accumulate savings and then invest. An increase in output and capacity utilization increases profits and hence the funds available for investment, producing a feedback accelerator influence of economic growth on investment (Lavy and Pedroni, 1990).

Another likely important determinant is the crowd-in effect of public investment on private investment because of complementarities and other external effects. A

significant proportion of government investment is in infrastructure, public utilities and basic industries which raise the profitability of private investment. This may dominate the public investment financial crowding-out effect on private investment which occurs when the government borrows heavily from the banking system, thereby limiting the amount of loanable funds available to the private sector as found by various studies, for example cited in Ndulu (1990). Another important determinant of private investment therefore is the availability of domestic credit to the private sector (dcp).

In formal terms and assuming a linear behavioral relationship, then:

$$i_p = \alpha_0 + \alpha_1 u + \alpha_2 i_g + \alpha_3 dcp$$

where u stands for capacity utilization.

It is postulated that u in turn increases with the availability of raw materials and other intermediate imports (normalised by Q and denoted by n). The ISI strategy that the country pursued in the past, of indiscriminately providing high protection to domestic industries from foreign competition and maintaining an overvalued currency, made intermediate imports crucial for capacity utilization. There is limited substitutability of imported and domestic inputs and neither the agricultural sector nor the industrial sector can significantly increase output in the short to medium-term without adequate supplies of intermediate imports such as fuel, fertilizers and raw materials, which are financed from exports and net capital inflows. Formally:

(2) $u = u_0 + u_1 n$

where u_0 captures the autonomous influences (e.g liberalization of consumer imports and changes in the weather) on capacity utilization in both the agricultural and industrial sectors.

The relationship between private investment, intermediate imports, public investment, and private sector credit all as proportions of Q, can then be written as:

(3) $i_p = i_0 + i_1 n + i_2 i_g + i_3 dcp$

From Equations (1) and (3), an equation relating i_g to g, dcp and n is therefore derived as follows:

(4)
$$i_g = \frac{1}{k(1+i_2)}g - \frac{i_3}{(1+i_2)}dcp - \frac{i_1}{(1+i_2)}n - \frac{i_0}{(1+i_2)}$$

There are three sources of savings to finance investment, viz. the private sector (S_p), public sector (S_g), and the external sector (S_f). This accounting identity must necessarily hold *ex post* (after normalization):

(5)
$$i_p + i_s = s_g + s_p + s_f$$

Government savings are equal to recurrent revenues from taxes, appropriations-in-aid and parastatal profits (T) plus foreign grants (T^*) minus consumption expenditures on final goods and services (GOV), domestic subsidies and transfers (W), debt service charges on domestic borrowing (R), and on foreign borrowing (R^*). Formally after normalization with Q:

$$s_g = t + t^* - gov - w - r - r^*$$

It is postulated that in the medium term the domestic budget surplus (t-*gov-w-r*) is a positive function of domestic income and capacity utilization, with t increasing faster than the government's domestic recurrent expenditures (*gov+w+r*). The public sector savings function may therefore be written as:

(6)
$$s_g = \delta_0 + \delta_1 u + t^* - r^*$$

Saving by the private sector is also postulated to be a positive function of capacity utilization. Studies generally find changes in real income (and hence capacity utilization) an important determinant of private savings while net inflows of capital have a significant negative influence, even though this may be tautological because private savings are measured by the difference between total savings and foreign savings. The real interest rate is usually a non-significant determinant. Hence:

(7)
$$s_p = \pi_0 + \pi_1 u = \pi_2 s_f$$

Foreign savings on the other hand are equal to the sum of intermediate (N) imports; capital (M^k) imports; and competitive (M) imports of goods and non-factor services plus the net factor income payments abroad (J^*) minus exports (E) of

goods and non-factor services. After normalization by Q, the foreign savings equation can be written as:

(8)
$$\bar{s}_f = \bar{n} + \bar{m}^k + \bar{m} + \bar{j}* = \bar{e}$$

where the bar denotes that the variable is postulated to be either exogenous or policy-determined, so that capital imports are residually determined.

Policy-makers obviously have limited control over the availability of foreign savings. Intermediate and final imports on the other hand are rationed by the state through quantitative restrictions and are a function of foreign-exchange availability; the state has little influence on external debt charges especially interest rate obligations on past loans; while exports which are mainly of the primary-type are mainly influenced by domestic weather conditions and the state of demand in the external markets.[5]

The fiscal gap is then linked to the public sector borrowing requirements, PSBR, expressed as a proportion of Q. This is equal to the PSBR/actual output ratio, p, multiplied by the capacity utilization rate with PSBR targets usually set against the actual rather than potential output. Formally:

$$PSBR \, / \, Q = PSBR \, / \, X \times X \, / \, Q = pu = i_g - s_g$$

so that

(9)
$$pu = i_g - \delta_0 - \delta_1 u - t* + r*$$

Substituting the expressions for u and i_g from Equations (2) and (4), respectively, into Equation (9) and solving for g gives the fiscal gap as:

(10)
$$g_g = k\left[(1 + i_2)\left((\delta_1 + p)\, u_0 + \delta_0 + t* - r*\right) + i_0 + i_3 dcp\right]$$
$$+ k\left[(1 + i_2)(p + \delta_1)\, u_1 + i_1\right]n$$

Growth is limited by the availability of intermediate imports according to the coefficient $+k\left[(1 + i_2)(p + \delta_1)\, u_1 + i_1\right]$ A shortage of intermediate imports hampers economic growth directly by reducing private investment and indirectly by reducing capacity utilization and hence government savings, PSBR and the public investment crowd-in effect on private investment. The economic growth function shifts directly with changes in autonomous private investment and private sector

credit and indirectly through the influence of net external grants, autonomous public savings and capacity utilization on the public investment crowd-in effect.

To derive the savings gap, substitute the expressions for $i(i_p + i_g)$, u, s_g and s_p from Equations (1), (2), (6) and (7), respectively, into identity Equation (5) which yields the following relationship:

(11)
$$g_s = k\left[(\delta_1 + \pi_1)\,u_0 + \pi_0 + \delta_0 + (1 - \pi_2)s_j + t*-r*\right]$$
$$+k\left[(\delta_1 + \pi_1)u_1\right]n$$

Growth is limited by the availability of intermediate imports according to the coefficient $k\left[(\delta_1 + \pi_1)u_1\right]$. Shortages of intermediate imports hamper economic growth by reducing capacity utilization and hence private and public savings. The economic growth function shifts directly with net foreign savings and autonomous changes in private and public savings and indirectly through the influence of autonomous changes in capacity utilization on savings.

It is postulated that there is limited substitution between capital goods imports and domestically produced capital goods. A small low-income economy is unlikely to have much capacity for the production of capital goods at international prices, hence a large proportion of investment will depend on the availability of foreign exchange for their importation. To derive the foreign exchange gap, let imports of capital goods be a constant proportion (v) of the total investment, hence $M^k = vi$. Then the foreign savings Equation (8) becomes:

$$s_f = n + vi + m + j*-e$$

From the basic growth Equation (1), $i = g / k$. Hence

$$s_f = n + \frac{v}{k}g + m + j*-e$$

so that

(12)
$$g_f = \frac{k}{v}\left(s_f + e - j*-m\right) - \frac{kn}{v}$$

Growth is limited by intermediate imports according to the coefficient $-k / v$. There is a negative relationship between intermediate imports and growth because of the trade-off between intermediate imports and capital imports. Given final imports, increasing capital imports to expand the economy's productive base occurs

at the expense of increasing intermediate imports to raise the capacity utilization of the economy's existing productive base. The growth function shifts upwards with net foreign savings and exports and it shifts downwards with final imports and net factor payments.

IV Parameterization and the evolution of the three gaps

The behavioral parameters were derived by regression analysis from equations fitted to 1967-90 Kenyan data by OLS, except for the output/capital ratio whose average historical value in the previous decade was estimated by the Government (Kenya, 1986, p.16): 'it has required nearly six units of new capital to produce one unit of output'. To each equation was added time trend variables $(t,\ t^2,\ and\ t^3)$ to capture the influence of omitted determinants. The derived parameter estimates are:

Growth:	$k = 0.167$
Capacity utilization:	$u_0 = 0.790;\ u_1 = 0.308$
Private investment:	$i_0 = 0.015;\ i_1 = 0.350;\ i_2 = -0.430;\ i_3 = 1.007$
Private savings:	$\pi_0 = -0.013;\ \pi_1 = 0.224;\ \pi_2 = 0.443$
Public savings:	$\delta_0 = -0.053;\ \delta_1 = 0.071$

These parameters to a large extent conform with *a priori* expectations[6]. Table 1 below gives the mean values of some of the variables in the analysis expressed, unless indicated otherwise, as a proportion of potential output, Q. To derive potential output and hence the capacity utilization of the economy, real GDP was regressed on the time trend and the maximum residual value added to the predicted real income.

Table 1 is fairly consistent with some of the points raised in Section II, and they show the following:

- The net foreign savings ratio increased to a peak in 1979-83, declined in 1984-88 and slightly increased in 1989-90. Net foreign savings were estimated by the deficit on the current account of the balance of payments.

Table 1 Mean values of variables expressed as a proportion of potential output, Q

	1969-73	1974-78	1979-83	1984-88	1989-90
Foreignsavingsratio,sf	0.017	0.031	0.059	0.023	0.030
Intermediateimportsratio,n	0.147	0.208	0.188	0.141	0.139
Finalimportsratio,m	0.055	0.049	0.050	0.037	0.046
Capitalimportsratio,v	0.278	0.309	0.269	0.288	0.319
Externalgrantsratio,t^*	0.002	0.005	0.006	0.014	0.028
Debtserviceratio[1],r^*	0.009	0.009	0.022	0.034	0.037
Factorpaymentsratio,j^*	0.023	0.038	0.032	0.033	0.052
Exportsratio,e	0.234	0.296	0.240	0.216	0.224
PSBR/outputratio,p	0.052	0.066	0.093	0.075	0.078
Privateinvestmentratio,ip	0.122	0.140	0.149	0.154	0.165
Publicinvestmentratio,ig	0.060	0.081	0.080	0.055	0.050
Privatesavingsratio,sp	0.149	0.167	0.174	0.204	0.193
Publicsavingsratio,sg	0.016	0.022	-0.005	-0.018	-0.008
Capacityutilizationrate,u	0.843	0.911	0.911	0.895	0.937
Growthinreal,Q	0.062	0.020	0.019	0.042	0.055
Privatesectorcredit,dcp	0.138	0.169	0.194	0.172	0.170

[1]This underestimates the actual debt service ratio because it excludes debt payments to the IMF.

- The intermediate imports ratio increased to a peak in 1974-78 and declined thereafter. Similarly, the final imports ratio declined consistently from 5.5% in 1969-73 to 3.7% in 1984-88. It increased to 4.6% in 1989-90. The economy undoubtedly experienced some import compression in the 1980s.
- The capital imports/total investment ratio was fairly stable at 27-32%.
- The foreign grants ratio increased throughout but was offset by a general increase in both the net factor payments and the debt service ratios.
- The exports ratio increased to a peak of 29.6% in 1974-78 and then declined to 21.6% in 1984-88. It slightly increased in 1989-90 to 22.4%. This partially explains the import compression that occurred in this period.
- The PSBR ratio increased to a peak in 1979-83 and declined thereafter as a result of the implementation of the budget rationalization policies which, however, led to a reduction in the public investment ratio. In contrast, the private investment ratio increased throughout. PSBR was measured by annualized budget deficits.
- The private savings ratio indicates a strong upward trend although it declined slightly in 1989-90. In contrast, the government savings ratio showed a strong downward trend after 1974-78 and was negative throughout. National savings therefore were almost all generated by the private sector, with the

public sector generally a net dis-saver. Private savings were measured by the gap between gross investment and government savings plus net foreign savings inflow, and government savings by the gap between current revenues (net of external grants) and the government's current expenditures as given in the budget accounts.

- Capacity utilization consistently increased from 84.3% in 1969-73 to 93.7% in 1989-90 and was therefore high throughout. The economy experienced a capacity growth of 1.9-6.2% with the lowest rate experienced in 1979-83 and the highest in 1969-73. Private sector credit was fairly stable and varied between 17% and 19.4%.

Inserting the above benchmark parameters and the average sub-period values for the other variables into Equations (10), (11) and (12) gives the following relationships between growth of potential output and normalized intermediate imports which are utilized for a retrospective evaluation of the evolution of the three gaps:

<table>
<tr><td>1969-73</td><td>1974-78</td></tr>
</table>

$$g_g = 0.0290 + 0.0621n \qquad\qquad g_g = 0.0355 + 0.0625n$$
$$g_s = 0.0303 + 0.0152n \qquad\qquad g_s = 0.0342 + 0.0152n$$
$$g_f = 0.1039 - 0.6007n \qquad\qquad g_f = 0.1297 - 0.5405n$$

<table>
<tr><td>1979-83</td><td>1984-88</td></tr>
</table>

$$g_g = 0.0406 + 0.6326n \qquad\qquad g_g = 0.0352 + 0.0627n$$
$$g_s = 0.0389 + 0.0152n \qquad\qquad g_s = 0.0296 + 0.0152n$$
$$g_f = 0.1347 - 0.6208n \qquad\qquad g_f = 0.0980 - 0.5799n$$

<table>
<tr><td>1989-90</td></tr>
</table>

$$g_g = 0.0361 + 0.0628n$$
$$g_s = 0.0331 + 0.1517n$$
$$g_f = 0.0817 - 0.5235n$$

Following Taylor (1989), we examine the interactions between the three growth equations, two at a time. The equilibrium levels of normalised intermediate imports (n) and capacity economic growth (g) – where the various growth lines intersect – are the following:

1969-73 1974-78

$n_{gs} = 0.0290 \quad g_{gs} = 0.0308 \qquad n_{gs} = -0.0279 \quad g_{gs} = 0.0338$
$n_{gf} = 0.1131 \quad g_{gf} = 0.0360 \qquad n_{gf} = 0.1562 \quad g_{gf} = 0.0453$
$n_{sf} = 0.1195 \quad g_{sf} = 0.0321 \qquad n_{sf} = 0.1719 \quad g_{sf} = 0.0368$

          1979-83   1984-88

$n_{gs} = -0.0347 \quad g_{gs} = 0.0384 \qquad n_{gs} = -0.1173 \quad g_{gs} = 0.0278$
$n_{gf} = 0.1376 \quad g_{gf} = 0.0493 \qquad n_{gf} = 0.0977 \quad g_{gf} = 0.0413$
$n_{sf} = 0.1506 \quad g_{sf} = 0.0412 \qquad n_{sf} = 0.1150 \quad g_{sf} = 0.0313$

          1989-90

$n_{gs} = -0.0627 \quad g_{gs} = 0.0322$
$n_{gf} = 0.0777 \quad g_{gf} = 0.0410$
$n_{sf} = 0.0901 \quad g_{sf} = 0.0345$

where *gs* denotes the intersection point of fiscal and savings gap equations; *gf*, fiscal and foreign exchange gap equations and *sf*, savings and foreign exchange gap equations.

From these figures, it can be seen that the savings gap was binding on the growth of potential output *vis-à-vis* the foreign exchange and fiscal gaps for the following intermediate import ratios, with the foreign exchange gap binding for intermediate import ratios above the range and the fiscal gap binding for ratios below:

	Equilibrium n, %	Actual n, %
1969-73	2.90 – 11.95	14.7
1974-78	-2.79 – 17.19	20.8
1979-83	-3.47 – 15.06	18.8
1984-88	-11.73 – 11.50	14.1
1989-90	-6.27 – 9.01	13.9

When the equilibrium values are compared with the actual n, foreign exchange was clearly the binding constraint on the growth of capacity output in Kenya[7]. With the threshold equilibrium values of n generally declining over time, it is apparent that the impact of external shocks and the adjustment policies pursued

since the early 1970s was to increase the importance of the savings gap *vis-à-vis* the fiscal gap and the importance of the foreign exchange gap *vis-à-vis* the saving gap as constraints on potential growth in Kenya.

The economy would be in macro balance in a given time period if the three gap equations intersected at one (n,g) point which can be brought about by a downward shift of the fiscal gap equation; an upward shift of the savings gap equation and/or a leftward shift of the foreign exchange gap equation. The size of the gap triangles (the area enclosed by the three equations when drawn on the same diagram) can therefore be used to measure the degree of macro imbalances in a given period in the economy.

Figure 1a shows that macroeconomic imbalances worsened between 1969-73 and 1974-83 while Figure 1b shows that they worsened between 1979-83 and 1984-88 but slightly improved in 1989-90 as the implementation of stabilization and structural adjustment policies was accelerated. The results also seem to show that in the 1970s macroeconomic imbalances were positively correlated with potential economic growth. Reduction of macroeconomic imbalances is an important component of the structural adjustment policies advocated by the IMF and the World Bank. This result is therefore consistent with a finding by Khan (1988) that these policies have a negative impact on real income. In Kenya, however, this is reversed in the 1980s and there is some negative correlation between the size of macroeconomic imbalances and capacity growth. Policies that therefore reduce these imbalances would be good for economic growth.

To evaluate the sensitivity of these results for 1989-90 to changes in parameters, non-significant coefficients (the crowd-in effect and autonomous private investment and savings) were set at zero; k at 0.437 from Kenya (1987) because the parameter value used earlier probably overestimated the true ICOR; while the debt service ratio was increased to a more realistic level of $r* = 0.07$.

The derived growth equations are the following:

$$g_g = 0.0978 + 0.1730n$$
$$g_s = 0.0924 + 0.0397n$$
$$g_f = 0.2137 - 1.3699n$$

From these equations, the savings gap is binding on the growth of potential output for intermediate import ratios of −3.5% to 8.6%; the foreign exchange gap for ratios above the range and the fiscal gap for ratios below[8]. This is consistent with the earlier results that, for plausible values of n, the foreign exchange gap is binding on the growth of potential output, hence the model is apparently quite robust.

Figure 1a   Evolution of gap triangles, 1969-73 to 1979-83

Evolution of gap triangles, 1969 - 73 to 1979 - 83
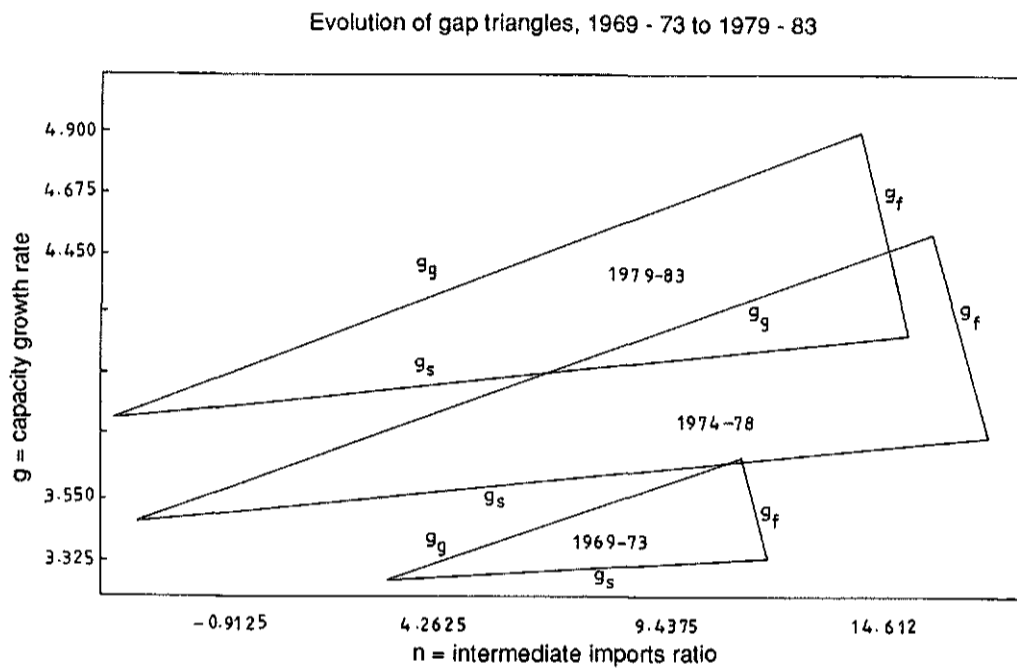
Figure 1b   Evolution of gap triangles, 1979-83 to 1989-90

Evolution of gap triangles, 1979 - 83 to 1989 - 90
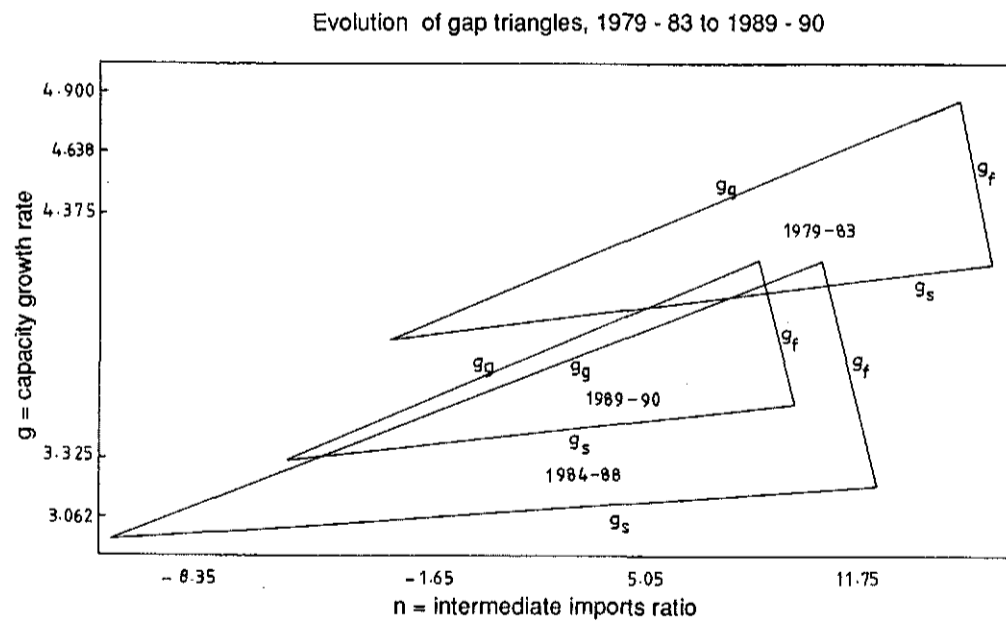
V Closing the gaps: the 1989-93 Development Plan

Sessional Paper Number 1 of 1986 contained economic growth targets for the period between 1984–2000. The policies in the paper were to be achieved in phases starting with the *1984-88 Development Plan* which, however, incorporated adjustments to accommodate the 1984 drought. The following data present targeted *vis-à-vis* actual economic performance in 1984-88 as well as growth projections for 1998-2000 contained in the paper.

	1984-88 target	1984-88 actual	1988-2000 target
Growth in:			
GDP at factor cost	4.8	5.3	5.6
Population	3.8	3.6	3.7
GDP per capita	1.0	1.7	1.8

The data show that actual performance was well on target in 1984-88, implying economic growth targets for 1988-2000 were achievable in the absence of major external shocks.

The *1989-93 Development Plan* covered policy areas such as employment generation and improved management of human and financial resources, regional balance and the environment. Attention was to be paid to the time-phasing of economic policies in order to achieve 'logical, sequential pattern' development. The plan targeted real GDP to expand at 5.4% per annum and, given a population expansion of 3.8% per annum, income per capita was expected to increase at 1.6% per annum. The assumption was that ICOR would remain stable or increase slightly. Gross investment was targeted to increase at 11.2% with inventory investment a stable component.

The model above is utilized to trace counterfactual shifts across equilibria from changes in PSBR, external grants, net factor payments, credit to the private

sector, net foreign savings, exports, debt payments, imports, and imported capital goods investment ratio. This was postulated in Kenya's Sixth Development Plan to evaluate the adequacy/consistency of the macroeconomic projections (and policies) contained therein to alleviate macro constraints to economic growth.

Kenya of course utilizes macro-models to analyze economic relationships and to make projections included in the government economic blueprints. The two models currently in use are the Macro Economic Policy Model for Kenya (KMEPMODL) which is used for short and medium-term modelling and the Computable General Equilibrium Model of the Kenyan Economy (CGE) which is used for long-term modelling and is based on the general equilibrium assumption that markets in the long-run equilibrate in response to changes in relative prices.

KMEPMODL, which is the one relevant to this paper, incorporates major definitional and behavioral linkages connecting various relationships, where the coefficients of the behavioral relationships are derived from historical data mainly starting from 1972/73. In projections, policy and forecasted exogenous variables are inputed to track endogenous variables. These projections are then utilized to appraise economic prospects; to evaluate alternative policy proposals; and to identify desired scenarios in documents such as the development plan and the annual/ forward budget. Among blocks in the structure of the model are identities and behavioral relationships on sectoral and aggregate GDP; investment, consumption and use of resources; balance of payments; government finances; money, credit and prices; and sectoral and aggregate employment. The model consists of more than 200 equations of which about 50 are behavioral or institutional while the remainder are identities.

Assuming full capacity utilization (where actual output equals potential output) the *1989-93 Development Plan* postulated the changes portrayed in Table 2 resulting from stabilization and structural adjustment of the economy during the plan period.

Benchmark coefficients (incorporating changes in the previous section) and these actual and projected variables (Table 2) are inserted in our model above to derive the following gap equations:

Actuals (1988)	Projections/ targets (1993)
$g_g = 0.1299 + 0.1686n$	$g_g = 0.1040 + 0.1667n$
$g_s = 0.1337 + 0.0397n$	$g_s = 0.0887 + 0.0397n$
$g_f = 0.2932 - 1.3699n$	$g_f = 0.1875 - 1.1293n$

Table 2 Changes resulting from stabilization and structural adjustment, 1989-93

	Actuals 1988	Projections / targets 1993
Foreign savings ratio, s_f	0.072	0.020
Capital imports ratio, v	0.319	0.387
Final imports ratio[1], m	0.049	0.049
External grants ratio, t^*	0.064	0.027
Debt service ratio, r^*	0.039	0.030
Factor payments ratio[1], j^*	0.055	0.055
Exports ratio, e	0.246	0.250
PSBR /output ratio, p	0.045	0.031
Private sector credit, dcp	0.235	0.215

[1] These were not reported and their 1989/90 values above are assumed to remain constant.

From the derived relationships between growth of potential output and normalized intermediate imports[9], it can be seen that for a plausible intermediate imports ratio (more than 11.3% in 1988 and 8.4% in 1993) the foreign exchange gap is binding on the growth of potential output.

Figure 2 shows that the policies represented by the parameter/variable shifts in the 1989-93 Plan were not adequate to reduce macroeconomic imbalances, or indeed to lead the economy along a large imbalances/low growth path. This is because the Plan envisaged substantial reductions in the country's dependency on foreign savings and external grants and increased dependence on imported capital goods without a commensurate rise in exports and/or a reduction in the debt burden to take up the slack. The target for the reduction in the budget deficit from 4.5% to 3.3% of GDP was also ambitious so that the increase in macroeconomic imbalances, if the plan targets were achieved, is underestimated.

This analysis, of course, assumes that the Plan is fully implemented and the targets achieved. This is unlikely, and current indications are that many of these targets are not achievable. This is not exclusive to the 1989-93 Develop*ment Plan*. Killick (1981), for example, analyzed the extent to which the *1979-83 Development Plan* contained realistic macroeconomic projections and targets given the historical trend and concluded that they were generally overestimated and therefore not realizable. If the country's anticipated reduction in external savings and grants is exaggerated and exports underestimated, then the rise in macroeconomic imbalances and their impact on growth would be less.

Figure 2   Evolution of gap triangles, 1988-93

Evolution of gap triangles, 1988 - 93
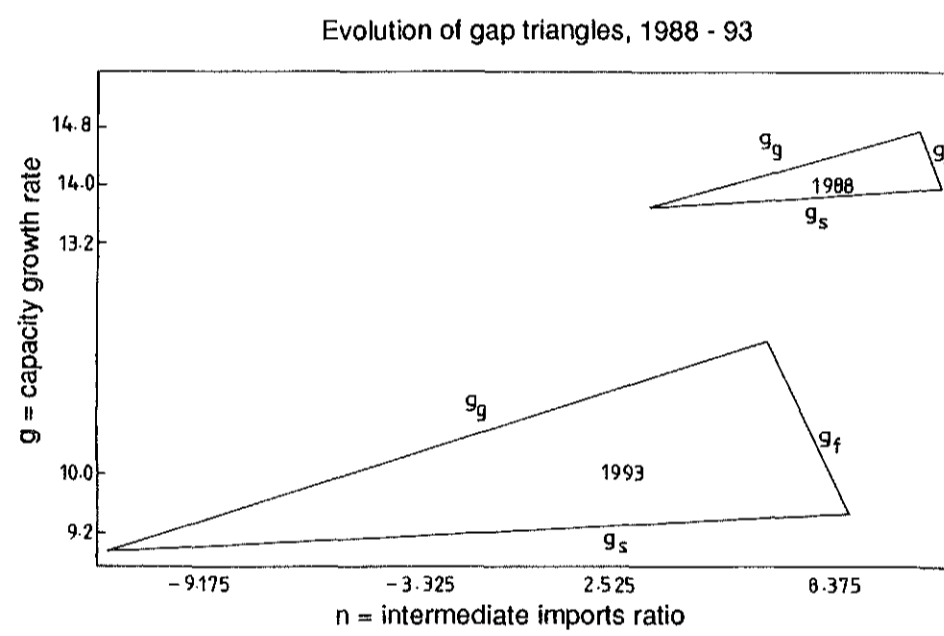
VI Conclusions

This paper has used a simple analytical framework to study whether it is the saving, fiscal or foreign exchange gap which is the binding constraint on capacity growth in Kenya and how these gaps have evolved since the early 1970s. The three-gap framework applied in the study extends the traditional two-gap model by distinguishing the fiscal constraint as another potential, important, independent impediment to economic growth. We find that, for plausible intermediate import ratios, foreign exchange is the binding resource constraint to potential growth in Kenya. Thus, its increased availability through exports promotion and more concessionary capital inflows and the associated reduction of import compression would alleviate the saving, fiscal, and external gaps that undermine good macroeconomic performance. Some sensitivity analysis finds this conclusion quite robust while policies and the forecasted outcomes in the 1989-93 Development Plan are found to be inadequate or inconsistent with a reduction in macroeconomic imbalances in the country. Indeed, they may exacerbate these imbalances.

Notes

1. In 1990 the country had 0.8 million recorded visitors and tourism has, since 1987, overtaken coffee to become the country's main foreign exchange earner.

2. This rapid growth rate was, however, offset by a high population growth rate of more than 3% per annum.

3. This was nevertheless a period when the economy was growing very rapidly and high protection of the industrial sector was not necessary, with import licencing covering only about 70 commodities.

4. The IMF agreements reached in this period are discussed in detail by Killick (1984).

5. Attempts to make exports an endogenous function of the real exchange rate and hence amenable to policy, were unsuccessful as the coefficient, consistent with other studies on Kenya, was highly non-significant ($t = 0.11$). Ng'eno (1988), Mwamamzingo (1988) and Lesiit (1990) could not find a significant relationship between total, non-oil or manufactured exports and the real exchange rate. Hence it does not play a role in helping close the gaps by improving the trade balance, easing the foreign exchange constraint and making room for sustainable GDP growth.

6. Capacity utilization however was only significantly correlated with the intermediate imports ratio at the 20% level ($t = 1.143$) undoubtedly because of the narrow range within which the two variables have changed. Substitution possibilities between domestic and foreign intermediaries may also explain this weak relationship. Non-significant coefficients were the crowd-in effect ($t = 0.579$) and exogenous private investment ($t = 0.370$) and savings ($t = 0.163$). Other coefficients were significant at least at the 5%

level. The equations were controlled for serial correlation by the Cochrane-Orcutt method.

7. In more disaggregated periodization, it is possible that the binding constraint during the beverage exports boom of 1976-77 was the absorptive capacity rather than a shortage of foreign exchange. This episode was, however, short-lived.

8. The equilibrium values of n and g are:

$n_{gs} = 0.4118$ $g_{gs} = 0.0907$
$n_{gf} = 0.0751$ $g_{gf} = 0.1108$
$n_{sf} = 0.0861$ $g_{sf} = 0.0958$

9. The equilibrium values of n and g are:

1988		1993	
$n_{gs} = 0.0294$	$g_{gs} = 0.1349$	$n_{gs} = 0.1211$	$g_{gs} = 0.0839$
$n_{gf} = 0.1061$	$g_{gf} = 0.1478$	$n_{gf} = 0.0643$	$g_{gf} = 0.1148$
$n_{sf} = 0.1131$	$g_{sf} = 0.1382$	$n_{sf} = 0.0845$	$g_{sf} = 0.0920$

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ISBN 9966-900-01-2