A Consistency Framework
for Macroeconomic Analysis

William Easterly

Illustrating with data for Colombia and Zimbabwe, Easterly
presents a consistency framework useful for checking projec-
tions or constructing macroeconomic models, reconciling sepa-
rate accounts for the government, monetary system, nonfinan-
cial private sector, balance of payments, and national accounts.

Consistency is a hobgoblin (to borrow a phrase from Emerson) that macroeconomists cannot avoid. Macroeconomic consistency is the requirement that budget constraints be observed. Budget constraints do not uniquely determine a particular economic outcome, but they do allow analysts to rule out many outcomes when they have some notion of "reasonable" behavior. Often this is enough to evaluate whether a particular adjustment scenario is feasible. What seems at first to be a reasonable projection may be revealed as highly unlikely when analyzed in a full consistency framework.

Even where a fully specified behavioral model is desired, the consistency relations are invaluable in defining the structure of the model. The consistency framework is not itself a model, which can be used to do projections. It is a generic check on any projection done by an explicit or implicit behavioral model.

Easterly's consistency framework for macroeconomic analysis includes five accounts, in current prices: government, monetary system nonfinancial private sector, balance of payments and national accounts. Easterly presents these as individual accounts, then integrates them through a matrix of income, expenditures, savings, and accumulated assets and liabilities.

Examples of estimation of the framework are presented for Colombia and Zimbabwe.

This paper is a product of the Macroeconomic Adjustment and Growth Division, Country Economics Department. Copies are available free from the World Bank, 1818 H Street NW,Washington DC 20433. Please contact Raquel Luz, room N11-057, extension 61760 (39 pages with tables).

A Consistency Framework for Macroeconomic Analysis

by
William Easterly

Table of Contents

Introduction: why do we need consistency?

Is consistency "the hobgoblin of little minds," as Emerson once said? Since consistency is often tedious to enforce, it is important to remember for what purpose it is required in macroeconomics. Consistency is simply the requirement that budget constraints be observed for all participants in the economy.

Budget constraints appear at the economy-wide level in the form of four familiar macroeconomic identities. The <u>national accounts</u> identity tells us that total income from domestic production (value added) equals total expenditure on domestic production (total consumption, total investment, and net exports). This can be rearranged to give the identity that total saving (including foreign saving) must equal total investment. The <u>fiscal</u> identity equates the excess of public sector expenditure over income with total public sector borrowing and money creation. The <u>balance of payments</u> identity similarly equates the excess of foreign exchange expenditure over earnings with foreign borrowing and reserve changes. The <u>monetary</u> identity tells us that the increase in the money supply corresponds to the increase in domestic credit and foreign reserves. These identities imply as a residual the private sector budget constraint, but this is seldom included explicitly in macroeconomic analysis.

A basic consistency framework should require that all of these identities -- as well as the private sector budget constraint[1] -- be simultaneously satisfied. If one or more of the identities is left out of an

---

1   The private sector budget constraint would be analogous to the other identities -- that private income minus expenditure equal private net financial asset accumulation.

economic projection, the implicit values for the components of the missing
identity may take unrealistic values. Since the private sector is often the
residual, there may be unrealistic projections for private saving or money
demand. Even if all the identities are included, they may be satisfied in an
inconsistent way. For example, one estimate of government foreign borrowing
might be used for the balance of payments while a different one might be used
for the fiscal accounts.

However, a consistency framework is not in itself a model, such as
could be used to do projections. It is a generic check on any projection done
by an explicit or implicit behavioral model. It also could be used as the
foundation for construction of a macroeconomic model.

A hypothetical example of consistency problems

A hypothetical example may help illustrate the consistency problems
that are likely to arise when a complete framework is not used. Suppose that
an economic report projects an increase in growth in country X from its
present (1988) anemic rate of 2.4 percent to 4.8 percent by the year 2000. To
support this increase in growth, the rate of investment is projected to double
from 12 percent of GNP to 24 percent of GNP. At the same time, it is
projected that the current worrisome fiscal deficit of 6 percent of GNP is
gradually reduced to zero by the year 2000, financed entirely by increases in
taxes. Public investment and consumption stay constant at 6 percent and 10
percent of GNP respectively. Inflation is projected to remain constant at 10
percent per year. Finally, it is projected that the current account deficit
will remain stable at 3 percent of GNP.

Is this projection consistent? Yes, but only at very unrealistic
values for private sector investment, saving, and financial behavior. The
private investment ratio increases by a factor of three, from 6 percent of GNP

to 18 percent of GNP, since total investment is doubling while public investment is constant. To finance the higher investment with a given current account deficit, private saving will have to increase from 9 percent of GNP to 15 percent of GNP, while public saving increases from 0 to 6 percent of GNP. However, the higher public saving is financed by increased taxes, which decrease private disposable income. Thus, private saving as a percent of disposable income will have to increase even more, from 10 percent to 18 percent.[2] It is difficult to conceive of policy measures that would induce such a strong response in saving and investment.

These values of saving and investment also have implausible implications for financial aggregates. Let us assume for this example that 60 percent of saving goes into financial asset accumulation, with the other 40 percent going directly into self-financed investment. Let us also assume that the initial ratio of financial assets to GNP is 48 percent, which is the steady state value consistent with the initial saving rate and growth rate. Then the increase in saving rate would imply an increase in the ratio of financial assets to GNP in the economy from 48 percent to 59 percent by the year 2000. The long run effect is even greater, since the new steady state ratio of financial assets to GNP will be 68 percent. Since the public deficit is being reduced, the implications for private sector credit would be even stronger. Real private sector credit would be growing at around 14 percent per year for most of the period. In the long run, the ratio of private credit to GNP will be 90 percent, an astonishing increase over the initial value of 27 percent. The public sector would be a net creditor to the banking system in the amount of 22 percent of GNP in the long run.

---

2   This implies an even greater marginal propensity to save.

Such an outcome is not mathematically impossible, but it is very
unlikely that the policy actions, the private sector response, and external
conditions would all be sufficiently strong to generate these results in any
given country. What initially seemed like a reasonably feasible projection
becomes highly unlikely when it is analyzed in a full consistency framework.

A consistency framework for macroeconomic analysis

This paper presents the elements of a macroeconomic accounting
framework in current prices.[3]   The framework is based on five accounts,
corresponding roughly to the macro identities enumerated above: 1) government,
2) monetary system, 3) nonfinancial private sector, 4) balance of payments,
and 5) national accounts. These would be the minimum elements of a
consistency framework; we will also indicate where further disaggregation
might be useful in some cases.

The accounts will be presented in two ways. We will present first
the individual accounts, and then integrate them through a matrix of income,
expenditure, saving, and asset and liability accumulation.

1. Individual accounts

Account 1 is for the government, defined in the budgetary sense. If
non-budgetary public sector operations exist, then whatever is left out of the
public sector accounts will implicitly be included in the private sector. The
breakdown of public sector income and expenditure is limited to the main
national accounts and BOP categories. Value added income received directly by

---

3   An extension of the framework to constant prices is contained in Khadr and
    Schmidt-Hebbel (1989a). Host-Madsen (1979) provides a good general
    discussion of issues in macroeconomic accounting.

the public sector is the net operating surplus plus depreciation of public entities engaged in production, calculated before the payment of interest and taxes. In the government accounts, this item is sometimes presented as "nontax revenue."

The second half of Account 1 shows the asset and liability accumulation of the government. Investment represents the accumulation of physical capital, including inventories. Capital goods can be either domestic or imported. Net lending refers to loans made directly by the public sector to the private sector. The asset accumulation can be financed through public sector saving and borrowing from the monetary system, private sector, and foreigners.

In cases where there is detailed data on non-budgetary public entities, it would be useful to create a separate non-budgetary public sector account. This would require an accounting of flows between the budgetary and non-budgetary components, as well as their interaction with other sectors.

Account 2 shows the asset and liability changes for the monetary system. The breadth of coverage will depend on the availability of data and what financial aggregates are used in the policy dialogue. It will usually refer to the central bank and commercial banking system. We presume that the monetary system has no current income or expenditure. The interest income that it would receive on its loans to the government is assigned to the private sector, while interest flows to and from the private sector will net out. Interest expenditure on foreign debt of the financial system is also assigned to the private sector. Any value added in the financial sector is also implicitly included in the private sector (or possibly in the fiscal accounts in the case of public financial institutions). The exclusion of current flows on the monetary system is necessary because sufficient data is usually lacking to reconstruct these flows.

The monetary system will accumulate credit to the public and private sectors as well as short-term foreign assets (international reserves). The monetary system has liabilities in the form of currency, demand and quasi-money deposits from the private sector, and medium and long-term foreign debt. The change in net other liabilities is a residual item that will capture any profit or loss experienced by the monetary system (excluding revaluation due to exchange rate changes) -- this item will be treated as an asset of the private sector.

In many cases, it may be useful to disaggregate the monetary system into the central bank and the rest of the monetary system. This would provide insight into the management of monetary policy in countries where independent monetary management is feasible. We see explicitly the role of reserves held against banking deposits, and central bank credits to the government, banking system, and private sector. In both of the country examples that are provided in the Appendix, this disaggregation is performed.

Account 3 shows the nonfinancial private sector. The private sector receives value added income from production (wages plus profits) as well as transfers and interest income from the government, and transfers from abroad. They use their income to consume imported and domestic goods, to pay taxes, and to pay interest on the private foreign debt. The balancing item is private saving, defined as disposable income less current expenditures.

The capital account of the private sector includes accumulation of physical capital (domestic or imported), as well as of government bonds, currency, deposits and other assets in the monetary system, and foreign assets. They finance this accumulation with their own saving, borrowing from the monetary system and abroad, and net lending from the government.

Account 4 shows the income and expenditure of the external sector. Presentation of this account can be confusing, since we can look at it either

from the point of view of the rest of the world (ROW) or of nationals. To be
consistent with the other accounts, it is presented here from the point of
view of ROW, which means that imports are treated as income (of ROW) and
exports are treated as expenditure (of ROW). Similarly, external borrowing is .
viewed as asset accumulation by ROW.

Foreign exchange outlays in the current account (income of ROW) are
divided into interest on public and private foreign debt and imports.
Interest on public debt could be defined in net terms by subtracting interest
earned on foreign exchange reserves from interest paid on public foreign debt.[4]
It may be useful to break down imports into consumption imports (public and
private), investment imports (public and private), and intermediate imports.
However, it may not be possible in many cases to disaggregate imports in which
case only total imports will be estimated.

Foreign exchange receipts (expenditure of ROW) are broken down into
exports and transfers (public and private). It may be desirable in some cases
to disaggregate exports further into, for example, traditional and
nontraditional categories. In some countries, nonfinancial factor income
(such as wage remittances) may also need to be included. The balancing item
in the current account is foreign saving, which is equivalent to the current
account deficit.

The financing of the current account deficit is given in the capital
account part of Account 4. The public sector, monetary system, and private
sector all borrow abroad. The monetary system accumulates foreign assets in
the form of international reserves. The international reserves should be
defined in a way consistent with the standard definition used in the policy

---

4   This would be appropriate if interest on reserves are passed from the
    central bank to the budget. In other cases, this interest would have to
    be treated as private sector income.

dialogue. The private sector accumulation of assets could also be estimated when capital flight data is available. This can be estimated on the basis of the "errors and omissions" and "capital NEI" lines of the BOP in some cases. Accumulation of foreign assets by the government could be accomodated by defining their debt in net terms. The change in foreign debt and assets should exclude revaluation changes resulting from devaluation of the domestic currency or cross-currency rate changes. While this paper excludes capital gains and losses, an extension of the framework to include them is presented in Khadr and Schmidt-Hebbel (1989a).

The foreign currency figures of the balance of payments should be converted into domestic currency with the average official exchange rate for each period. In countries with multiple or parallel exchange rates, more complicated adjustments may be necessary.

The national accounts follow from the previous accounts. GDP is broken down on the income side into private sector value added, public sector value added (retained profits by state enterprises), indirect taxes, and subsidies (entering with a negative sign). On the expenditure side, GDP is disaggregated into consumption (public and private), investment (public and private), and net exports (exports minus imports). The capital account counterpart is the saving-investment identity, where the sum of public and private investment must equate to the sum of public, private, and foreign saving.

2. Matrix presentation

Although the individual accounts give a comprehensive presentation of the flows in the consistency framework, it is helpful to integrate the accounts so that they are mutually consistent. For this, a useful device is a matrix of sources and uses for the four sectors plus the national accounts.

The matrix can be seen as a combination of the flow-of-funds (FOF) and social accounting matrix (SAM) approaches to macroeconomic accounting. The FOF methodology emphasizes the equality of sources and uses of funds, distinguished between current and capital accounts. The version of the FOF methodology underlying this framework is that presented in Holsen (1989).

The SAM approach presents the standard macroeconomic identities (savings-investment, income-expenditure) in a form that shows the participation of each economic agent in the economy. The SAM has traditionally been used for analysis of the real economy, as in general equilibrium models, and thus covered only real variables. However, it has recently been extended to cover real-financial interactions as well (Easterly (forthcoming), Taylor and Rosensweig (forthcoming)).

The matrix has the advantage that it captures the strong points of both the SAM and FOF approaches. The matrix presentation has the appealing feature that the row sums must equate to the sums of the corresponding columns. This allows us to verify at a glance that the accounts are consistent. Like the SAM, it also presents the main macroeconomic identities in a transparent way. Thus the first row is the conventional GDP identity from the expenditure side, while the first column is the GDP identity from the income side. The last row and column give the identity of saving and investment.

As in the FOF approach, the matrix stresses the identity of sources and uses, distinguished between current and capital accounts. The upper left hand 5 x 5 corner of the matrix presents the current part of each of the five accounts (although the current account of the monetary system is left empty as explained earlier).

The remainder of the matrix records the capital account transactions for each sector. The connecting link between the two is the saving of each

sector, shown as a diagonal matrix in the lower left-hand part of the matrix. Thus, the first part of the matrix records the identity of current sources and uses, where the latter includes saving. The second half of the matrix--the lower half and the right half and their intersection--show the financing identity for each sector, with their borrowing shown across the row and their asset accumulation down the column. This is the identity of capital sources and uses, with saving again as the balancing item.

The matrix first presents the income and expenditure flows which correspond to GDP, in the first row and column. The next rows and columns give the income and expenditure of each agent, where the balancing item is saving. Finally the last rows and columns give the asset and liability accumulation of each agent in the capital account, where investment is included as accumulation of a physical asset. Saving is again the balancing item, presented now as a source of funds. Saving is equivalent to the change in net worth (abstracting from capital gains considerations), where net worth will include both physical capital and net financial assets.

Alternatively, we can think of the matrix as distinguishing "above the line" and "below the line" flows. This conforms to the conventional manner of presenting the public sector and balance of payments accounts. The lower right-hand 5 x 5 matrix represents the financial "below the line" flows, while the remainder represents "above the line" flows.

The sum of each capital account column will give the gross asset accumulation of that sector, including both physical capital and financial asset accumulation. The sum of each capital account row gives the sum of saving and gross borrowing by each sector (recall that for the monetary system, there is no saving). Since row sums must equal column sums in this matrix, this implies that investment plus financial asset accumulation must equal saving plus financial liability accumulation. This is another form of

the familiar identity that saving minus investment equals net financial asset accumulation for each sector.

For the monetary system, which has neither saving nor investment, this identity requires that the change in its net financial position is zero. This necessitates a residual item, called here "net other liabilities", which often appears explicitly in the primary data source.

The example of the public sector may be helpful in clarifying the use of the matrix. Reading across the row for public income (current sources), we get public value added and indirect taxes minus subsidies and direct taxes from the private sector. (Direct taxes are in turn an expenditure (or use) for the private sector.) Reading down the column for the public sector we get current expenditures such as government consumption, transfers, and interest payments. The balancing item that ensures the sum of the column entries will be equal to the sum of the row entries is government saving. By definition, saving plus current expenditure must equal current income.

The second part of the matrix will give the capital account of the public sector. Reading down the capital account column for the public sector, we see asset accumulation in the form of purchases of capital goods (investment) plus net lending to the private sector. This asset accumulation will be financed by public sector saving (which could be negative), and borrowing from the monetary system, private sector, and foreigners. Thus, total capital sources (including saving) will equal total capital uses. To put it another way, the public deficit -- public saving minus public investment -- will be equivalent to net borrowing from other sectors.

It may also be helpful to explain the national accounts row of the table in more detail. The first row gives the expenditure components of GDP. The aggregate consumption and investment expenditures (government and private) includes spending on both imported and domestic goods. Therefore, we have to

subtract imported goods expenditure from exports to obtain net foreign
exchange earnings, which will give us GDP when summed with total consumption
and investment. The imports are added back in further down the external
sector column, in the external sector row. Th'.s insures that that the external .
sector column sum will be total current foreign exchange receipts, while the
external sector row sum will be total current foreign exchange payments.

Problems of estimation

It is important to recognize some of the practical problems involved
in estimating the consistent framework described above with historical data.
The historical numbers themselves are usually not consistent. This is because
the different sets of accounts -- national accounts, fiscal account., balance
of payments accounts, and monetary accounts -- use different accounting
methodologies. For example, the balance of payments and national accounts are
estimated on an accrual basis, while the fiscal accounts are on a cash basis.
The monetary accounts are often inconsistent with fiscal and balance of
payments accounts so that we get different estimates of surpluses or deficits
from "above the line" or "below the line".

To construct the accounts, we will thus often have to choose between
competing estimates of the same concept. For example, either the balance of
payments or national accounts could be used to estimate exports and imports of
goods and nonfactor services. In the estimation examples below we used the
BOP estimates, since these accounts are more readily available on a timely
basis. Private consumption then must be adjusted to preserve the national
accounting identity.

Other items in the accounts can be estimated residually to preserve
accounting consistency. For example, in the Colombia estimates, the net
lending of the public sector to the private sector was estimated residually to

reconcile below the line financing with the estimated public sector deficit. Similarly, private foreign asset accumulation was estimated residually to reconcile foreign debt flows with the estimated current account deficit. These residuals will absorb the measurement errors and methodological inconsistencies in the accounts, and so should not be interpreted too literally. Where such residuals are excessively large, further work is needed to identify the source of the inconsistency.

Even substantial inconsistencies in the historical data do not necessarily render invalid the consistency exercise, whose purpose is to provide a framework for projections or analysis of policy tradeoffs. If we presume that the size of the inconsistency will remain within a limited range over time, then it will still be possible to use the framework for analysis of the future. The principle of enforcing budget constraints holds even if the historical data do not precisely fit these constraints. Measurement errors in accounting identities are analogous to stochastic error terms in behavioral equations -- in both cases the model remains useful even though it does not fit the data exactly.

Country examples

The appendix contains applications of this consistency framework to historical data for Colombia and Zimbabwe. It may provide additional insight to analyze what these applications tell us, and to indicate how implicit or explicit behavioral relations would be added. The analysis of historical data is purely for illustrative purposes -- usually this kind of a framework would be used as a basis for a projection or for a counter-factual simulation.

1. Colombia

The appendix shows the matrix of 1986 flows for Colombia as a percentage of GDP. We see that the public sector had a high rate of saving in 1986 (6.86% of GDP), which actually exceeded total public investment (5.33 + 1.34 = 6.67 % of GDP).[5] Despite this small public sector surplus, the government borrowed abroad in significant amounts (2.03 % of GDP). This foreign borrowing was used to reduce government debt at the central bank in an amount equal to 2.51 % of GDP. The rest of the foreign borrowing, together with modest borrowing from the financial system and directly from the private sector, was used to finance net lending (i.e. development credits) to the private sector in the amount of 0.58 % of GDP.

The central bank had substantial inflows of foreign reserves to accomodate in 1986, equal to 3.45 % of GDP, because of the current account surplus and substantial foreign borrowing. In this task, it would have been helped by the repayment of debt owed to it by the government, except this was mostly offset by credit expansion to the financial system (0.97% percent of GDP) and to the private sector (1.55% of GDP). The latter is calculated as a residual. In total, the liabilities of the central bank expanded by an amount equal to 3.46% of GDP. However, as shown in account 2, only 1.74 % of GDP of this amount corresponded to expansion of the monetary base. The remainder was accounted for by nonmonetary liabilities sold to banks and the nonfinancial public sector, and by foreign borrowing. The issuing of the nonmonetary liabilities was a sort of open-market operation that allowed the central bank to sterilize a substantial portion of the reserve increase.

---

5   Two decimal points are given to assist the reader in matching figures in the text to those in the table. It is unlikely that the quality of the data justifies such precision.

The financial system was only a minor source of finance to the
government (0.46% of GDP), despite the large increase in quasi-money deposits
by the private sector (7.81% of GDP). Most of this was returned to the
private sector as loans (6.97% of GDP), with the remainder tied up in the
central bank in the form of reserves (1.01% of GDP) or non-monetary assets
(0.99 % of GDP).

The private sector also had a higher rate of saving (12.41% of GDP)
than investment (9.01+2.27 = 11.28% of GDP), so its net financial accumulation
was positive. Even so, it had substantial borrowing from the public sector and
the central bank (development loans), the financial system, and abroad. Most
of the private saving went into currency, central bank bonds, or deposits in
the banking system, although a small amount (0.25 % of GDP) also went into
accumulation of foreign assets. However, the estimate of foreign asset
accumulation is derived as a residual, and so should be viewed with caution.

The resource surpluses of the public and private sectors imply an
overall current account surplus, which shows up in the matrix as negative
foreign saving (-1.34% of GDP). This outcome is partly explained by the high
coffee prices during 1986. Despite the current account surplus, there was a
substantial flow of foreign financing (2.36% of GDP), only slightly offset by
the private foreign asset accumulation. This is what resulted in the large
reserve accumulation at the central bank (3.45% of GDP).

It is useful to compare these results to the 1987 flows for Colombia,
also shown in the appendix. In 1987 public sector saving was much lower
(4.21% of GDP), reflecting the end of the coffee boom of the previous year.
The overall public sector balance -- saving less investment -- thus reverted
to a deficit of 1.59% of GDP. Net public foreign borrowing was actually
negative in 1987 (-0.61% of GDP), and net lending to the private sector was
slightly higher (0.79% of GDP), so there was much greater reliance on

financing from the central bank (1.38% of GDP) and financial system (1.3% of GDP).

The central bank financed its credit to the government with sizeable increases in its liabilities to the banking system (1.1% of GDP) and private sector (1.3% of GDP). Foreign borrowing at the central bank was close to zero in 1987, while international reserves declined. Most of the increase in domestic central bank liabilities was accounted for by expansion of high-powered money (1.9% of GDP).

The private sector showed a significant increase in saving over 1986 (to 16.4% of GDP). Together with borrowing from the government, financial system, and abroad, this was used to finance a considerable expansion in investment (to 13.5% of GDP), while the flow of deposits in the financial system also rose slightly (7.93% of GDP). The residual item -- accumulation of foreign assets -- is also larger in 1987 (1.24% of GDP).

It is instructive to compare the size of the residuals obtained in the exercise with independent estimates of these variables. The flow of net other assets of the central bank in the consistency calculation is 1.55 and 1.05 percent of GDP in 1986 and 1987, respectively. By contrast, the flow of net other assets plus lending to the private sector of the central bank calculated directly is -0.13 and -.05 percent of GDP in 1986 and 1987. This indicates an inconsistency in the numbers that could reflect, among other things, an operating loss at the central bank when capital gains on international reserves are excluded.

Similarly, the residual item for the public sector is net lending to the private sector, which is 0.58 and 0.79 percent of GDP in 1986 and 1987. A comparable direct estimate of this item would be the residual calculated by the IMF between the "above the line" deficit and the "below the line" financing, which is -0.4 and 0.2 percent of GDP in 1986 and 1987.

Finally, the residual for the balance of payments is foreign asset accumulation by the private sector, in the amount of 0.25 and 1.24 percent of GDP in 1986 and 1987. There is no direct estimate of this concept available, but a comparable item would be the errors and omissions line of the balance of payments. This shows 0.37 and 0.01 percent of GDP in 1986 and 1987.

These numbers should induce caution in interpreting any of the residual estimates too literally. It is inevitable that there be some discrepancy in attempting to reconcile the different accounts, as explained earlier. How much discrepancy is tolerable will vary from one country to another depending on the quality of the data available.

The numbers are also of limited relevance without introducing an implicit or explicit behavioral model to analyze them, such as would be done in a projection or a study of policy alternatives. For example, a portfolio model of private sector demands for financial assets might be specified. We then could ask what effect the shift towards domestic financing of the public sector deficit during 1987 had on inflation (through a money demand equation) and on interest rates (through an equation for portfolio demand for interest-bearing financial assets). In a projection, the question might be posed as to what interest rates and inflation would be necessary for the government to obtain a particular level and composition of domestic financing. Similarly, in a projection the consistency of foreign debt inflows and the current account deficit with export and import performance -- based on the real exchange rate, terms of trade, trade policy, etc. -- would need to be explicitly modelled. This could be used to ask what real exchange rate would be necessary to support a particular outcome.

2. Zimbabwe

This example is based on a more detailed presentation contained in Khadr and Schmidt-Hebbel (1989b). Their presentation also contains an extension to constant prices.

The matrix of 1987 flows for Zimbabwe (see Table 1) shows that public dissaving was significant (3.8% of GDP). The overall public sector borrowing requirement amounted to some 10% of GDP. Foreign borrowing and credit from the financial system were both relatively modest (1.6% and 1.9% of GDP, respectively). The bulk (6.8% of GDP) came from borrowing from the private sector. Aside from public investment (3.6% of GDP) and public dissaving, the remainder of government borrowing (2.9% of GDP) was used mainly to provide capital transfers to parastatals, which are subsumed in the private sector.

For the central bank, foreign reserve inflows were significant in 1987 (2.3% of GDP). Total domestic credit expansion was negligible, but there was a slight increase in credit to the government (0.7% of GDP) at the expense of a contraction in credit to the private sector (which includes local government and parastatals). There was also a minor entry for repayment of foreign loans. The liabilities of the central bank therefore increased by some 2.5% of GDP, predominantly in the form of commercial bank reserves.

The banking sector was a modest source of finance to the government (1.2% of GDP) and the private sector (0.9% of GDP) in 1987. More important was the increase in reserves with the central bank (2.7% of GDP). The corresponding increase in the liabilities of the banking system (5.0% of GDP) took the form of an increase in demand deposits (0.9%) and time deposits (4.1%).

The savings of the private sector (23% of GDP) significantly exceeded its investment (15% of GDP) in 1987. This aside, capital flows to the private sector included capital transfers from the government (mainly to parastatals)

(2.9% of GDP), loans from the banking system (0.9% of GDP) and foreign

borrowing (0.2% of GDP). Uses in the private sector's capital account covered

lending to the government (ie, acquisition of bonds and Treasury bills) (6.8%

of GDP), an increase in holdings of currency and demand deposits (0.9% of

GDP), an increase in quasi-money (4.1% of GDP), repayments to the central bank

(0.5% of GDP) and disinvestment by foreign multinationals (0.4% of GDP).

Finally, the large excess of private saving over investment in 1987

allowed a modest current account surplus in the balance of payments (0.8% of

GDP) to coexist with the sizeable public deficit. The surplus is the result

mainly of tight restrictions on imports. The inflow of foreign borrowing (2%

of GDP) largely financed foreign reserve accumulation by the central bank

(2.3% of GDP).

As with the Colombia example, the Zimbabwe consistency framework

would have to be used together with a behavioral model to deepen the analysis.

We could ask what the heavy reliance of the government on domestic bonds sold

to the private sector means for crowding out of private investment. In a

projection, we could look at the government's future debt service requirements

based on the existing stock of government debt and discuss what the tradeoffs

were among alternative fiscal adjustment strategies.

Conclusion

To answer Emerson's question posed at the beginning, consistency is a

hobgoblin that cannot be avoided by macroeconomists.[6] Even though measurement

errors may prevent us from observing exactly the budget constraints, we at

least know the equations that must be approximated. This is an improvement

---

6   No doubt Emerson would have responded that this confirms that
    macroeconomists have "little minds".

over the situation often encountered in economic analysis where both the form of the equation and the data are uncertain. While budget constraints do not uniquely determine a particular economic outcome, they do allow us to rule out a great many outcomes when we have some notion of "reasonable" behavior. In many cases this is enough to evaluate whether a particular adjustment scenario is feasible. Even where a fully-specified behavioral model is desired, the consistency relations are invaluable in defining the structure of the model. A good grasp of consistency is a necessary addition to the macroeconomist's toolkit.

Sources (across) and Uses (down)	Current account of:					Capital account of:					TOTAL
	National Accounts	Budgetary Public Sector	Monetary System	Nonfinancial Private Sector	External	Budgetary Public Sector	Monetary System	Nonfinancial Private Sector	External	Total Investment	
National Accounts		Government Consumption		Private Consumption	ExportsGNFS minus ImportsGNFS	Government Investment		Private Investment		Total Investment	GDP
Budgetary Public Sector (Government)(G)	Indir Taxes -Subsidies + Net Gov't Oper. Surplus			Private Direct Taxes	Transfers E to G						Gross Government Income
Monetary System (MS)											
Non-Financial Private Sector (PR)	Private Wages + Profits	Transfers +Interest G to P			Transfers E to PR						Gross Private Income
External Sector (E)		Interest G to E		Interest PR to E	ImportsGNFS						Gross For Exchange Payments
Saving and borrowing of:											
Budgetary Public Sector		Government Saving					d MS Credit to Govt	d PR Credit to Govt	d For Debt of Govt		Borrowing +Saving of G
Monetary System								d Broad Money (M2)+ d Net Other liab. of MS	d For Debt of MS		d MS Liabilities
Non-Financial Private Sector				Private Saving		Net Lending to PR	d MS Credit to PR		d For Debt of PR		Borrowing + Saving of PR
External Sector					Foreign Saving (=CA Def.)		d Internat Reserves of MS	d For. Assets of PR			d Int'l Reserves + CA deficit
Saving--total (sum of previous 4 rows)		Government Saving		Private Saving	Foreign Saving						Total Saving
TOTAL	GDP	Tot Current Govt Uses		Tot Current PR Uses	Total FX Receipts	Asset Accum of Govt	d MS Assets	Asset Accum of PR	d Tot For Debt	Total Investment	

- 21 -

1. GOVERNMENT (G)

Current Revenue:	Current Expenditures:
Direct Taxes	Government Consumption
Indirect Taxes	Domestic Transfers
Net Operating Surplus	Interest Payment:
	on Domestic Debt held by PR
Transfers from Abroad	on Foreign Debt
Less: Subsidies	Gov't Saving
Change in Assets:	**Change in Liabilities:**
Government Investment	Government Saving
Net Lending to PR	Change in MS Credit to Gov't
	Change in PR Credit to Gov't
	Change in Foreign Credit to Gov't

Gov't Saving = Direct taxes + Indirect Taxes + Net Operating Surplus
        + Transfers from Abroad - Subsidies - Consumption - Dom. Transfers
        - Interest on Dom. Debt held by PR - Interest on For. Debt

  Investment + Net Lending to PR   =   Saving + dMS Credit to Gov't
                               + dPR Credit to Gov't
                               + dForeign Credit to Gov't

2. MONETARY SYSTEM (MS)

Change in Assets:	Change in Liabilities:
Change in MS credit to Government	Change in Broad Money (M2)
Change in MS credit to PR	Change in MLT Foreign Debt of MS
Change in Foreign Reserves of MS	Change in Net Other Liab. to PR

  dCredit to Gov't + dCredit to PR   = dM2 + dMLT For. Debt
  + dForeign Reserves   + dNet Other Liab. to PR

MLT: medium- and long-term
d: change in a financial stock within period

3. NON-FINANCIAL PRIVATE SECTOR   (PR)

Current Revenue:	Current Expenditures:
Value Added Income (wages + profits)	Consumption: Domestic PR Consumption
Domestic Transfers from Gov't	Private Consumer Imports
Interest Payment on Domestic Debt held by PR	Direct Taxes
	Interest Paid on Private For. Debt
Transfers from Abroad	
	PR Saving
Change in Assets:	**Change in Liabilities:**
Private Investment	PR Saving
Change in PR Credit to Government	Change in MS Credit to PR
Change in Broad Money (M2)	Change in Foreign Debt of PR
Change in Foreign Assets of PR	Net Lending from Government
Change in Net Other Liabilities of MS	

Private Saving = Value Added Income + Domestic Tranfers from Gov't
             + Interest on Dom. Debt + Transfers from Abroad
             - Consumption - Direct Taxes - Interest on Private Foreign Debt

Investment + dCredit to Gov't   =   Saving + dMS Credit to PR
+ dM2 + DForeign Assets   + dForeign Debt
+ dNet Other Lib. of MS   + Net Lending from Gov't

4. EXTERNAL ACCOUNTS (E)

Current Revenue (of ROW):	Current Expenditures (of ROW):

Interest:
  Received from Gov't
  Received from PR
 	
Imports (GNFS)
	Exports (GNFS)
	
	Current Transfers to Government
	
	Current Transfers to PR
	
	Foreign Saving (= CA Deficit)

Change in Assets (of ROW):	Change in Liabilities (of ROW):
Change in Net Foreign Debt of Gov't Change in MLT Foreign Debt of MS Change in Foreign Debt of PR	Foreign Saving (= CA deficit) Change in Foreign Reserves of MS Change in Foreign Assets of PR

* ROW = Rest of World

CA Deficit = Interest from Gov't + Interest from PR + Imports - Exports
               - Current Transfers to Gov't - Current Transfers to PR

    dNet Foreign Debt of Gov't   =   CA Deficit
    + dMLT Foreign Debt of MS   + dForeign Reserves of MS
    + dForeign Debt of PR   + dForeign Assets of PR

CA Deficit: Current Account Deficit

BIBLIOGRAPHY

Easterly, W. "Portfolio Effects in a CGE Model: Devaluation in a Dollarized Economy" in L. Taylor, ed. <u>Structuralist Computable General Equilibrium Models</u>, [forthcoming].

Holsen, J. "An Illustration of RMSM-X [Revised Minimum Standard Model--Extended]," [1989].

Host-Madsen, P. <u>Macroeconomic Accounts: An Overview</u>. International Monetary Fund, Pamphlet Series No. 29, Washington, D.C., [1979],

Khadr, A. and K. Schmidt-Hebbel. "A Framework for Macroeconomic Consistency in Current and Constant Prices," CECMG, [1989a].

_____. "A Macroeconomic Consistency Framework with an Application to Zimbabwe," CECMG, [1989b].

Rosensweig, J. and L. Taylor "Devaluation, Capital Flows, and Crowding-Out: A CGE Model with Portfolio Choice for Thailand" in Taylor, ed. <u>Op.cit.</u> [forthcoming].

APPENDIX I: COUNTRY APPLICATIONS

COLUMBIA

CONSISTENCY ACCOUNTING MATRIX

1986 Current Prices (as a % of GDP)

Sources (across) and uses (down)	National Accounts	Public Sector	Central Fin Bank System	Private Sector	External	Public Sector	Central Bank	Financial System	Private Sector	External Sector	Total Investment (subtotal)	TOTAL
					Current account of				Capital account of			
National Accounts		Gov't Consum. Domestic 8.09		Private Consum. Domestic 63.71	XGNFS 19.03 Int. M -5.17	Gov't Inv. Domestic 5 33			Private Inv. Domestic 9.01		Total Inv Domestic 14 34	100.00
Non-Financial (G) Public Sector	NCOS 9 56 Taxes 12 44 Subs -0 55			Taxes 2.04 Int 0.14								23.63
Central (CB) Bank												
Financial (FS) System												
Non-Financial (PR) Private Sector	Private Value 78 54 Added	Int. 0.75 Trfers 5.55			Int. 0 03 Trfers 2.28							87.18
External Sector		Int. 2.26 Cons. M 0.11		Int. 1.20 Cons M 0.99 NF Srv 6.65	Int. M 5.17	Inv M 1.34			Inv. M 2.27		Total Inv. M 3 61	20.00
Saving and borrowing of:												
Non-Financial Public Sector		Gov't Saving 6 86					CB credit to G -2 51	FS credit to G 0.46	Bonds to PR 0.41	For. Debt of G 2 03		7.25
Central Bank								Reserves 1.01 NM Liab. 0.99	Currency 0.73 NM Liab. 0.53	For. Liab. of CB 0.21		3.46
Financial System								CB credit to FS 0 97	Quasi M 7 81 NO Liab. 1.21	For. Debt of FS -0 57		9.43
Non-Financial Private Sector				Private Saving 12 43		Net Lending to PR 0 58	CB credit to PR 1 55	FS credit to PR 6 97		Credit -0 28 DFI 0 07		22.22
External Sector					Foreign Saving -1 34	For Reserves of CB 3 45		For. Assets of PR 0.25				2.36
Saving--total (sum of previous 5 rows)		Gov't Saving 6.86		Private Saving 12 43	Foreign Saving -1 34							17.95
TOTAL	100 00	23 63		87.18	20 00	7.25	3 46	9.43	22.22	2 36	17 95	

Memo:
Savings - Investment   0 19   1.15   -1 34

Variable Names:
  NCOS: Net Gov't Operating Surplus   Trfers Transfers
  Subs : Subsidies   NM Liab   Non-monetary Liabilities
  Int . Interest   NO Liab   Net Other Liabilities
  NF Srv. Non-factor Services   Quasi M   Quasi Money
  Int M: Intermediate Imports   DFI   Direct Foreign Investment
  Inv M. Investment Imports   For Liab   Foreign Liabilities
  Cons M: Consumption Imports   XGNFS   Exports of Goods and Non factor Services

COLOMBIA

CONSISTENCY ACCOUNTING MATRIX

1987 Current Prices (as a % of GDP)

14-Apr

Sources (across) and uses (down)	Current account of: National Accounts	Public Sector	Central Fin. Bank System	Private Sector	External	Capital account of. Public Sector	Central Bank	Financial System	Private Sector	External Sector	Total Investment (subtotal)	TOTAL
National Accounts		Gov't Consum. Domestic 7.51		Private Consum. Domestic 63.39	XGNFS 18.94 Int M -5.32	Gov't Inv. Domestic 4.65			Private Inv. Domestic 10.83		Total Inv. Domestic 15.48	100.00
Non-Financial (G) Public Sector	NGOS 7.38 Taxes 12.44 Subs -0.55			Taxes 1.16 Int. 0.21								20.66
Central (CB) Bank												
Financial (FS) System												
Non-Financial (PR) Private Sector	Private Value 80.72 Added	Int 0.89 Trfers 5.03			Int 0.05 Trfers 2.77							89.46
External Sector		Int 2.89 Cons M 0.13		Int. 0.54 Cons M 1.22 NF Srv 6.50	Int M 5.32	Inv. M 1.15			Inv. M 2.67		Total Inv. M 3.82	20.41
Saving and borrowing of												
Non-Financial Public Sector		Gov't Saving 4.21					CB credit to G 1.38	FS credit to G 1.30	Bonds to PR 0.32	For. Debt of G -0.81		6.59
Central Bank							Reserves 0.74 MM Liab. 0.39	Currency 1.15 MM Liab. 0.13		For. Liab. of CB 0.04		2.46
Financial System							CB credit to FS 0.58		Quasi M 7.93 NO Liab. 1.43	For. Debt of FS -0.43		9.52
Non-Financial Private Sector				Private Saving 16.44		Net Lending to PR 0.79	CB credit to PR 1.05	FS credit to PR 7.09		Credit -0.09 DFI 0.43		25.71
External Sector					Foreign Saving -1.34		For. Reserves of CB -0.55		For. Assets of PR 1.24			-0.66
Saving—total (sum of previous 5 rows)		Gov't Saving 4.21		Private Saving 16.44	Foreign Saving -1.34							19.30
TOTAL	100.00	20.66		89.46	20.41	6.59	2.46	9.52	25.71	-0.66	19.30	

Memo:
Savings - Investment

| | | | | | -1.59 | | | 2.93 | -1.34 | | |

Variable Names.

NGOS: Net Gov't Operating Surplus   Trfers   Transfers
Subs : Subsidies   MM Liab   Non-monetary Liabilities
Int   Interest   NO Liab   Net Other Liabilities
NF Srv. Non-factor Services   Quasi M   Quasi Money
Int. M: Intermediate Imports   DFI   Direct Foreign Investment
Inv. M: Investment Imports   For. Liab   Foreign Liabilities
Cons M   Consumption Imports   XGNFS   Exports of Goods and Non-factor Services

COLOMBIA

1. Non-Financial Public Sector (Government)	1986	As % of GDP	1987	As % of GDP
Current Revenue (millions of current pesos)	1583864	23.63	1813535	20.66
Direct Taxes (Private (total))	136636	2.04	102069	1.16
Indirect Taxes	833864	12.44	1092431	12.44
Int. Rec'd. from No-Fin. Priv. Sector	9200	0.14	18800	0.21
Net Current Transfers from Abroad				
Net Operating Surplus (nontax revenues)	640700	9.56	648100	7.38
Net Subsidies	-36536	-0.55	-47865	-0.55
Current Expenditures (millions of current pesos)	1123864	16.77	1444135	16.45
Interest	201800	3.01	331400	3.77
to Non-Financial Private Sector	50200	0.75	77800	0.89
to External Sector	151600	2.26	253600	2.89
Current Transfers (net)	372264	5.55	441735	5.03
Consumption Expenditures	549800	8.20	671000	7.64
Domestic	542187	8.09	659510	7.51
Imported	7613	0.11	11490	0.13
Government Savings	460000	6.86	369400	4.21
Asset Accumulation	48`774	7.25	578439	6.59
Net Capital Transf. and Gov't Lend	38574	0.58	69439	0.79
Fixed capital formation	447200	6.67	509000	5.80
domestic goods	357295	5.33	408355	4.65
imported goods	89905	1.34	100645	1.15
Financing	25774	0.38	209039	2.38
Net Central Bank Lending	-168462	-2.51	120954	1.38
Net Banking System Lending	30967	0.46	113714	1.30
Bonds to private sector	27299	0.41	27858	0.32
Net Foreign Debt	135960	2.03	-53487	-0.61
Memo: Gov't net financing requirement	12800	0.19	-139600	-1.59

COLOMBIA

2. Central Bank (CB)	1986	As % of GDP	1987	As % of GDP
Change in Assets	231805	3.46	215871	2.46
Net Foreign Reserves Central Bank	231073	3.45	-48692	-0.55
Net Central Bank Lending to Gov't	-168452	-2.51	120954	1.38
Domestic Credit to Private Sector	-28722	-0.43	-2688	-0.03
Credit to Banking System	65189	0.97	51345	0.58
Net other assets (priv sector)	132718	1.98	94952	1.08
Change in Liabilities	231805	3.46	215871	2.46
Change in High Powered Money:	116429	1.74	166458	1.90
Currency	48876	0.73	101112	1.15
Bank Reserves	67553	1.01	65346	0.74
Change in Non-Monetary Liabilities:	101462	1.51	45788	0.52
Banks	66112	0.99	34286	0.39
Non-Financial Private Sector	35350	0.53	11502	0.13
Change in Foreign Liabilities	13914	0.21	3625	0.04

3. Financial System (FS)	1986	As % of GDP	1987	As % of GDP
Change In Assets	631826	9.43	835688	9.52
Net Credit to Government	30967	0.46	113714	1.30
Net Credit to Private Sector	467194	6.97	622342	7.09
Central Bank Reserves	67553	1.01	65346	0.74
International Reserves (net)	0	0.00	0	0.00
Non-Monetary Credit to CB	66112	0.99	34286	0.39
Change in Liabilities	631826	9.43	835688	9.52
Gross Credit from CB	65189	0.97	51345	0.58
Quasi-Money	523582	7.81	696487	7.93
Net Long-Term Foreign Borrowing	-38023	-0.57	-37757	-0.43
Change in Net Other Liabilities to PR (residual)	81078	1.21	125613	1.43

COLOMBIA

4. Private Sector (PR)	1986	As % of GDP	1987	As % of GDP
Income	5840687	87.16	7853753	89.46
Non-Financial Private Sector Value Added	5263397	78.54	7086758	80.72
Interest	52531	0.78	81924	0.93
Int. Received from Government	50200	0.75	77800	0.89
Int. on Foreign Assets	2331	0.03	4124	0.05
Current Transfer Receipts	524759	7.83	685071	7.80
From Government	372264	5.55	441735	5.03
From Abroad (net)	152495	2.28	243336	2.77
Expenditures	5840687	87.16	7853753	89.46
Direct Taxes	136636	2.04	102069	1.16
Interest	89936	1.34	66034	0.75
Int. Paid to Public Sector	9200	0.14	18800	0.21
Int. Paid to Rest of the World	80736	1.20	47234	0.54
Private Consumption	4781341	71.35	6242714	71.11
Domestic	4269500	63.71	5564955	63.39
Imported	511841	7.64	677759	7.72
Private Savings	832774	12.43	1442936	16.44
Capital Account				
Financing	1488936	22.22	2257055	25.71
Private Savings	832774	12.43	1442936	16.44
Gov't. Capital Transfers & Net Lending	38574	0.58	69439	0.79
Credit from CB (plus net other assets of CB)	103996	1.55	92264	1.05
Credit from Banking System	467194	6.97	622342	7.09
Credit from Abroad	-18511	-0.28	-7629	-0.09
Direct Foreign Investment	64909	0.97	37702	0.43
Asset Accumulation	1488936	22.22	2257055	25.71
Private Investment	755825	11.28	1185429	13.50
domestic goods	603875	9.01	951032	10.83
imported goods	151950	2.27	234396	2.67
Domestic Government Debt	27299	0.41	27858	0.32
Money & Quasi Money	572458	8.54	797599	9.08
Currency	48876	0.73	101112	1.15
Quasi Money	523582	7.81	696487	7.93
Non-Monetary Assets at CB	35350	0.53	11502	0.13
Non-Fin. Private Sector Foreign Assets	16926	0.25	109064	1.24
Net Other Liabilities of FS	81078	1.21	125613	1.43

COLOMBIA

5. Balance of Payments (in local currency)	1986	As % of GDP	1987	As % of GDP
Resource Balance				
Exports (G+NFS)	1275129	19.03	1662593	18.94
Imports (G+NFS)	1107870	16.53	1491311	16.99
Intermediate Imports	346562	5.17	467020	5.32
Consumer Imports	519464	7.75	689249	7.85
Goods	73819	1.10	118393	1.35
Public Sector	7613	0.11	11490	0.13
Private Sector	66206	0.99	106902	1.22
Non-factor Services	445635	6.65	570857	6.50
Investment Imports	241855	3.61	335042	3.82
Public Sector	89905	1.34	100645	1.15
Private Sector	151950	2.27	234396	2.67
Factor payments	255453	3.81	339409	3.87
Int. Payment by Gov't on For. Debt	174717	2.61	292175	3.33
Int. Paid on Private For. Debt	80736	1.20	47234	0.54
Factor Income	25448	0.38	42699	0.49
Int. on Private For. Assets	2331	0.03	4124	0.05
Int. Received on public foreign assets	23117	0.34	38575	0.44
Net Transfers	152495	2.28	243336	2.77
Net Cur. Trans. Rec'd from Abroad by Gov't	0	0.00	0	0.00
Net Cur. Trans. Rec'd from Abroad by Priv. Secto	152495	2.28	243336	2.77
Aggregate Foreign Exchange Earnings	1453072	21.68	1948627	22.20
Aggregate Foreign Exchange Payments	1363324	20.34	1830720	20.85
Current Account Deficit	-89749	-1.34	-117907	-1.34
Net L-T External Borrowing	158250	2.36	-57546	-0.66
Net Gov't Foreign Borrowing	135960	2.03	-53487	-0.61
Net Private Foreign Borrowing	-18511	-0.28	-7629	-0.09
Net CB Foreign Borrowing	13914	0.21	3625	0.04
Net Banking System Foreign Borrowing	-38023	-0.57	-37757	-0.43
Direct Foreign Investment	64909	0.97	37702	0.43
Short-term foreign assets	247999	3.70	60362	0.69
CB Foreign Reserves	231073	3.45	-48692	-0.55
Nonfin private sector foreign assets	16926	0.25	109054	1.24

COLOMBIA

6. National Accounts	1986	As % of GDP	1987	As % of GDP
Total Value Added Income (GDP)	6701425	100.00	8779424	100.00
Non-Financial Priv. Sector Income	5263397	78.54	7086758	80.72
Net Operating Surplus of Government	640700	9.56	648100	7.38
Indirect Taxes	833864	12.44	1092431	12.44
Less Subsidies	-36536	-0.55	-47865	-0.55
Government domestic consumption	542187	8.09	659510	7.51
Private Domestic consumption	4269500	63.71	5564955	63.39
Govt investment (domestic)	357295	5.33	408355	4.65
Private investment (domestic)	603875	9.01	951032	10.83
Exports GNFS - Intermediate imports	928668	13.86	1195572	13.62
Total Expenditures (GDP)	6701425	100.00	8779424	100.00
Consumption	5331141	79.55	6913714	78.75
Gov't Consumption	549800	8.20	671000	7.64
Private Consumption	4781341	71.35	6242714	71.11
Investment	1203025	17.95	1694429	19.30
Gov't Investment	447200	6.67	509000	5.80
Private Investment	755825	11.28	1185429	13.50
Exports of Goods and Nonfactor Services	1275129	19.03	1662593	18.94
Imports of Goods and Nonfactor Services	1107870	16.53	1491311	16.99
Gov't Consumption Imports	7613	0.11	11490	0.13
Private Consumption Imports	66206	0.99	106902	1.22
Intermediate Imports	346562	5.17	467020	5.32
Government Investment Imports	89905	1.34	100645	1.15
Private Investment Imports	151950	2.27	234396	2.67
Nonfactor services	445635	6.65	570857	6.50
GDP	6701425	100.00	8779424	100.00

Table 2
ZIMBABWE

T-Table for the Non Financial Public Sector (Government)
Millions of Zimbabwe dollars, and as % of GDP

S o u r c e s   U s e s

C u r r e n t   A c c o u n t

		1987	1987 %			1987	1987 %
Government Value Added	GFY	435.00	4.47	Government Consumption	Cg	2031.00	20.89
Indirect Taxes	TI	1371.00	14.10	Interest Payments to PR	I3.Bg	352.00	3.62
Direct Taxes from PR	TDpr	1507.00	15.50	Govt. Transfers to PR	GTR	750.00	7.71
Interest rec'd. from PR	I6.GKTR	0.00	0.00	Interest Payments to ROW	I.E.FBg	226.00	2.32
Transfers to Govt. fr. Abr.	E.NTRGO	115.00	1.18	Government Saving	Sg	-369.00	-3.79
				Subsidies	GSUB	438.00	4.50
Total CA Gov. Sources		3428.00	35.25	Total CA Gov. Uses		3428.00	35.25

C a p i t a l   A c c o u n t

		1987	1987 %			1987	1987 %
Government Saving	Sg	-369.00	-3.79	Investment of Govt.	Ig	351.00	3.61
Borrowing from CB	dDCg	66.00	0.68	Inc.in direct lending to PR	dGKTR	285.00	2.93
Borrowing from BS	dCBSg	120.00	1.23				
Borrowing from PR	dBg	681.00	6.90				
Borrowing from ROW	E.dBFg	158.00	1.62				
Total Gov. Sources		636.00	6.54	Total Gov. Uses		636.00	6.54

Note: Lower case d denotes a first difference.

(1) $Sg=GFY+TI-GSUB+TDpr+E.NTRGO-Cg-I3.Bg-GTR-EI.BFg$

(1') $Ig+dGKTR=Sg+dDCg+dCBSg+dBg+E.dBFg$

Table 3
ZIMBABWE

T-Table for Central Bank
Millions of Zimbabwe dollars, and as % of GDP

Sources   Uses

Capital   Account

		1987	1987 %			1987	1987 %
Increase in vault cash	dHbs	-7.00	-0.07	Lending to Govt.	dDCg	66.00	0.68
Increase in BS deposits	dDBBScb	269.00	2.77	Lending to BS	dDCbs	0.00	0.00
Increase in Currency	dHpr	4.00	0.04	Lending to PR	dDCpr	-49.00	-0.50
Increase in iR deposits	dDBPRcb	0.00	0.00	Accumulation of net reserves	E.dRcb	223.00	2.29
Foreign borrowing	E.dNFBcb	-26.00	-0.27				
Total CB Sources		240.00	2.47	Total CB Uses		240.00	2.47

(2') dDCg+dDCbs+dDCpr+E.dRcb = dHbs+dDBBScb+dHpr
+dDBPRcb+E.dNFNcb

Table 4
ZIMBABWE

T-Table for Banking System
Millions of Zimbabwe dollars, and as % of GDP

Sources   Uses

Capital   Account

		1987	1987 %			1987	1987 %
Borrowing from CB	dDCbs	0.00	0.00	Lending to Govt.	dCBSg	120.00	1.23
Increase in Demand Deposits	dDEPpr	85.00	0.87	Accumulation of Vault Cash	dHbs	-7.00	-0.07
Increase in Quasi-Money	dQMON	396.00	4.07	Accumulation of deposits at CB	dDEPScb	269.00	2.77
Borrowing from ROW	E.dNFBbs	0.00	0.00	Lending to Private Sector	dCBSpr	92.00	0.95
				Accum. of net foreign reserves	E.dRbs	7.00	0.07
Total BS Sources		481.00	4.95	Total BS Uses		481.00	4.95

(3') dCBSg+dHbs+dDEPScb+dCBSpr+E.dRbs = dDCbs+dDEPpr
+dQMON+E.dNFBbs

Table 6
ZIMBABWE

T-Table for The Rest of the World (ROW)
Millions of Zimbabwe dollars, and as % of GDP

S o u r c e s   U s e s

C u r r e n t   A c c o u n t

		1987	1987 %			1987	1987 %
Interest rec'd. from Govt.	i.E.BFg	226.00	2.32	Payments for Exports	E.XGNFS	2691.00	27.57
Paym. for Govt.Consump.Imports	E.Mg	277.00	2.85	Net Transfers to Govt.	E.NTRGO	115.00	1.18
Profit remittances	r.E.DFI	98.00	1.01	Net transfers to PR	E.NTRPR	0.00	0.00
Interest rec'd. from PR	i.E.BFpr	36.00	0.37	Workers' remittances	E.WREM	-37.00	-0.38
Paym. for PR Consump. Imports	E.Mpr	760.00	7.82	Interest on net PR reserves	i.E.Rpr	18.00	0.19
Paym. for intermediate Imports	E.MINT	668.00	6.87	Savings of ROW	Sf	-76.00	-0.78
Paym.for Govt. Investm.Imports	E.Igm	124.00	1.28				
Paym.for PR Investment Imports	E.Ipm	512.00	5.27				
Total CA ROW Sources		**2701.00**	**27.78**	**Total CA ROW Uses**		**2701.00**	**27.78**

C a p i t a l   A c c o u n t

		1987	1987 %			1987	1987 %
Saving of ROW	Sf	-76.00	-0.78	Inc. in Govt. for.borrowing	E.dBFg	158.00	1.62
Increase in CB net reserves	E.dRcb	223.00	2.29	Inc. in CB for. borrowing	E.dNFBcb	-26.00	-0.27
Increase in BS net reserves	E.dRbs	7.00	0.07	Inc. in BS for. borrowing	E.dNFBbs	0.00	0.00
Increase in PR net reserves	E.dRpr	0.00	0.00	Inc. in PR for. reserves	E.dBFpr	62.00	0.64
				Direct Foreign Investment	E.dDFI	-40.00	-0.41
Total ROW Sources		**154.00**	**1.58**	**Total ROW Uses**		**154.00**	**1.58**

(5) Sf=i.E.BFg+E.Mg+r.E.DFI+i.E.BFpr+E.Mpr+E.MINT+E.Igm
+E.Ipm-E.XGNFS-E.NTRGO-E.NTRPR-E.WREM-i.E.Rpr

(5') E.dBFg+E.dNFBcb+E.dNFBbs+E.dBFpr+E.dDFI = Sf+E.dRcb
+E.dRbs+E.dRpr

Table 7
ZIMBABWE

T-Table for the National Accounts
Millions of Zimbabwe dollars, and as % of GDP

S o u r c e s   U s e s

C u r r e n t   A c c o u n t

		1987	1987 %			1987	1987 %
Central Govt. Consumption	Cg	2031.00	20.89	Government Value Added GFY		435.00	4.47
Private Consumption	Cpr	5558.00	57.16	PR Value Added	PRFY	8356.00	85.93
Central Govt. Investment	Ig	351.00	3.61	Indirect Taxes	TI	1371.00	14.10
Private Investment	Ipr	1444.00	14.85	Less:			
Exports of GNFS	E.XGNFS	2681.00	27.57	Subsidies	GSUB	438.00	4.50
Less:							
Central Govt.Consumption	E.Mg	277.00	2.85				
Priv. Consumption Imports	E.Mpr	760.00	7.82				
Central Govt.Invest.Imports	E.Igm	124.00	1.28				
Priv. Investment Imports	E.Ipm	512.00	5.27				
Intermediate goods Imports	E.MINT	668.00	6.87				
Total NA Sources		**9724.00**	**100.00**	**Total NA Uses**		**9724.00**	**100.00**

(7)   GDP = Cg+Cpr+Ig+Ipr+E.(XGNFS-Mg-Mpr-Igm-MINT)

(7')   GDP = GFY+PRFY+TI-GSUB

	Title	Author	Date	Contact for paper
WPS204	The Impact of Labor Costs on Manufactured Exports in Developing Countries. An Econometric Analysis	Luis Riveros	May 1989	R. Luz 61762
WPS205	What Determines National Saving? A Case Study of Korea and the Philippines	Sang-Woo Nam	May 1989	R. Luz 61762
WPS206	The Effects of Single-Sex Schooling on Student Achievement and Attitudes in Nigeria	Valerie E. Lee Marlaine E. Lockheed	May 1989	C. Cristobal 33640
WPS207	Occupational Training Among Peruvian Men: Does It Make a Difference	Ana-Maria Arriagda	May 1989	C. Cristobal 33640
WPS208	Effective Primary Level Science Teaching in the Philippines	Marlaine E. Lockheed Josefina Fonacier Leonard J. Bianchi	May 1989	C. Cristobal 33640
WPS209	Can the Industrial Countries Return to Rapid Growth? Space Seminar	International Economics Department and International Economic Analysis and Prospects Division		
WPS210	Notes on Cash-Flow Taxation	Roger H. Gordon	June 1989	A Bhalla 60359
WPS211	Coffee Pricing Policies in the Dominican Republic	Panos Varangis	May 1989	D. Gustafson 33714
WPS212	Beyond the Debt Crisis: Alternative Forms of Financing	Lessard		
WPS213	Conditionality and Debt Relief	Stijn Claessens Ishac Diwan	June 1989	S. King-Watson 33730
WPS214	Adjustment and the Labor Market	Peter R. Fallon Luis A. Riveros	June 1989	R. Luz 61762
WPS215	Adjustment and Income Distribution: A Counterfactual Analysis	Francois Bourguignon William H. Branson Jaime de Melo	May 1989	M. Ameal 61466
WPS216	Price and Quality Effects of Vers--Revisited: A Case Study of Korean Footwear Exports	Jaime de Melo L. Alan Winters	June 1989	M. Ameal 61466
WPS217	Public Debt, North and South	Helmut Reisen		

	Title	Author	Date	Contact for paper
WPS218	Public Finance, Trade and Development	Vittorio Corbo		
WPS219	Rural Credit in Developing Countries	Avishay Braverman J. Luis Guasch	June 1989	C. Spooner 37570
WPS220	Capacity Building for Policy Analysis: Lessons of Experience	Samuel Paul David Steedman Francis X. Sutton		
WPS221	How Does Uncertainty About the Real Exchange Rate Affect Exports?	Ricardo J. Caballero Vittorio Corbo	June 1989	A. Oropesa 61758
WPS222	Why Stabilisation Policies in Zambia Did Not Succeed	Christopher Colclough		
WPS223	Overvalued and Undervalued Exchange Rates in An Equilibrium Optimizing Model	Jose Saul Lizondo		
WPS224	The Economics of the Government Budget Constraint	Stanley Fischer	May 1989	S. Fischer 33774
WPS225	Targeting Assistance to the Poor: Using Household Survey Data	Paul Glewwe Oussama Kanaan	June 1989	B. Rosa 33751
WPS226	Inflation and the Costs of Stabilization: Historical Cases, Recent Experiences and Policy Lessons	Andres Solimano		
WPS227	Institutional Reforms in Sector Adjustment Operations	Samuel Paul		
WPS228	Economic Performance of Developing Countries in the 1980s	Robert Lynn F. Desmond McCarthy		
WPS229	The Demographic Transition and Saving for Life-Cycle Motives in Developing Countries	Steven B. Webb Heidi Zia		
WPS230	Unemployment, Migration and Wages in Turkey, 1962-1985	Bent Hansen		
WPS231	The World Bank Revised Minimum Standard Model	Doug Addison	May 1989	J. Onwuemene-Kocha
WPS232	Kenya: Women and Food Security	PHRWD		
WPS233	Public Enterprise Reform in Adjustment Lending	John Nellis		
WPS234	A Consistency Framework Macroeconomic Analysis	William Easterly	June 1989	R. Luz 61760