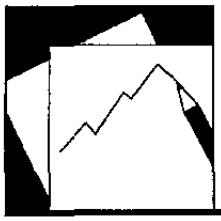
# Working Paper

INTERNATIONAL MONETARY FUND

WP/01/4



# IMF Working Paper

# Are African Current Account Deficits Different? Stylized Facts, Transitory Shocks, and Decomposition Analysis

*César Calderón, Alberto Chong, and Luisa Zanforlin*

INTERNATIONAL MONETARY FUND

 WP/01/4

**IMF Working Paper**

African Department

# Are African Current Account Deficits Different? Stylized Facts, Transitory Shocks, and Decomposition Analysis

Prepared by César Calderón, Alberto Chong, and Luisa Zanforlin[1]

Authorized for distribution by Sérgio Pereira Leite

January 2001

## Abstract



This paper analyzes the behavior of current account deficits in Africa and estimates whether the deficits are excessive with respect to fundamentals. The findings are that deficits are (i) not very persistent; (ii) positively linked with domestic growth; (iii) strongly linked with public (and private) savings, suggesting that fiscal consolidation in IMF-supported programs may be relatively effective; (iv) linked with aid flows, so as to close the external gap, and (v) linked with currency depreciation and the terms of trade. The deficit is "excessive," as it is almost 3 percent of the gross national disposable income above the equilibrium level.

JEL Classification Numbers: F30, F32, F40

Keywords: Current Account, Dynamic Panel Data Models, Decomposition Analysis

Author's E-Mail Address: crcn@troi.cc.rochester.edu; achong@worldbank.org; lzanforlin@imf.org.

---

[1] César Calderón: University of Rochester; Alberto Chong: The World Bank and Georgetown University; Luisa Zanforlin: International Monetary Fund. We would like to acknowledge comments and suggestions from Norman Loayza and Sérgio Pereira Leite.

Contents Page

## I. INTRODUCTION

Policymakers view the evolution of the current account balance as a key leading indicator of the health of a country's economy. Given the macroeconomic fragility of the developing world, especially African countries, arriving at a clear understanding of the factors that affect the current account balance appears to be a sensible strategy for effective policymaking. The contribution of this paper is to help provide clues toward the design of such a strategy in Africa, not only by helping uncover the possible factors that may affect the behavior of the current account but also by using them to estimate whether current account balances in African countries are in line with fundamentals.

Recent studies on current account determination have included Debelle and Faruqee (1996), and Calderón, Chong, and Loayza (1999). The former use a panel of 21 industrial countries over 1971-93 and an expanded cross-sectional data set that includes an additional 34 industrial and developing countries in order to explain long-term variations and short-run dynamics of the current account by specifying cross-section and panel data models, respectively. Calderón, Chong, and Loayza (1999) provide a general characterization of the empirical linkage between current account deficits and a broad set of economic variables for 44 countries for the period 1966-95. Their main findings are that current account deficits are persistent; increases in domestic growth generate larger deficits; transitory increases in public or private savings have positive effects on the current account but their permanent changes have insignificant effects; increases in terms of trade or appreciation of the real exchange rate are linked with larger current account deficits; and finally, either higher growth rates in industrialized economies or higher international interest rates reduce the current account deficit in developing economies.

The first objective of this paper is to identify similar stylized facts for sub-Saharan African countries and to see how they differ from other developing countries. Indeed, there are quite a few characteristics that indicate that what drives the current account balances in Africa may be different. For one, deficits in the current account in Africa and, in particular, in sub-Saharan Africa, have been very large in recent years. During the period 1975-95, sub-Saharan Africa had the world's highest current account deficit (5.9 percent of the gross national disposable income). Moreover, the rate of growth of the region has been dismal (Easterly and Levine, 1997), the reliance on foreign aid has been very high (World Bank, 1998), public and private savings have been very low, the concentration of exports on single primary products continues to be quite significant, and the distortions in the economy (for instance, as measured by the black market premium) have also been very large. All of these characteristics emphasizing the fact that the determinants of current account balances in Africa are probably different, not only in terms of magnitude but, given the many peculiarities of the region, also in terms of direction.

The second objective of this paper is to use our findings about the determinants of the current account from current account determination in order to calculate whether the current account deficits in Africa are "excessive" with respect to fundamentals, as defined by the

difference between the actual and estimated fitted values. This is done for the region and for each African country of our sample by source of disequilibrium: external, internal, or global (the evolution of the world economy).

We take advantage of a large macroeconomic data set that includes information on savings, aid flows, and other relevant national income variables for a panel of 64 countries for the period 1975-1995, of which 30 are African countries. We follow Calderón, et al. (1999) and adopt a reduced-form approach, instead of holding to a particular structural model, so that a comprehensive menu of determinants, identified by the literature, may be included. Finally, given the fact that current account deficits may be persistent (Calderón, et al, 1999), we use a dynamic panel data approach that helps control for problems of joint endogeneity of the explanatory variables and correlated unobserved country-specific effects (Arellano and Bover, 1995; Blundell and Bond, 1997).

This paper is organized as follows. The next section describes the data. Section III presents simple correlation analysis. Section IV very briefly describes the Arellano-Bover-Blundell-Bond dynamic panel data methodology (which is explained in more detail in Appendix I). Section V presents our empirical results, linking them to theoretical work where relevant. In Section VI we calculate the fitted and actual values of the current account deficits for the different regions, as well as for the African countries in our sample; following Easterly Loayza, and Montiel (1997), we estimate whether these values are "excessive" for Africa. Finally, Section VII concludes.

## II. DATA

Our objective is to provide an extensive analysis of the various determinants of current account deficits in Africa, so as to explain whether such deficits are "excessive" with respect to developing countries as a whole. We rely on previous theoretical and empirical research in order to choose an operational set of variables encompassing the various dimensions of current account determination. From the theoretical literature, we use domestic output growth (Sachs, 1982; Glick and Rogoff, 1995; and Razin, 1995), the real exchange rate (Stockman, 1987), terms of trade fluctuations (Obstfeld, 1982; and Tornell and Lane, 1998), fiscal policy variables (Leiderman and Razin, 1991; and Frenkel and Razin, 1996), capital controls (Mendoza, 1991), and world economy shocks (Glick and Rogoff, 1995; and Razin, 1995).

Data are taken mostly from the International Monetary Fund and the World Bank databases. In addition, two data sets were made available to us: (a) a savings data set from the World Savings Database (Loayza and others 1998),[2] which uses data adjusted for capital gains and losses that accrue to the public and private sectors as a result of inflation, that is, for the erosion of the real value of nonindexed public debt; and (b) aid flows, as expressed by

[2] These data are available at the World Bank website at *http://www.worldbank.org.*

the effective development assistance (*EDA*) provided to a country—an aggregate measure that combines total grants and grant components of all official loans—which are calculated using a new approach based on a loan-by-loan basis, that reflects the financial cost a creditor incurs in making loans on concessional terms (Chang, Fernandez Arias, and Serven, 1998). Aid is a variable of particular importance in the African context (Collier and Gunning, 1999; and World Bank, 1998). For instance, in sub-Saharan Africa, aid represents about 25 percent of the gross national disposable income (Table 2). Detailed definitions and sources are presented in Table 1.

Additionally, in order to ensure a minimum time-series dimension and to allow an adequate implementation of our dynamic panel data methodology, we include countries that have at least six consecutive annual observations. This approach generates a sample with 64 countries and 759 annual observations for the period 1975-95 and a sub-sample for Africa of 30 countries and 302 observations for the same period.

## III. Basic Correlation Analysis

We use both cross-country 1975-95 average ("long-run") and pooled annual cross-country time-series ("short run") data and correlate current account deficit (as percentage of gross national disposable income) with its possible determinants, by regions.[3] Results are shown in Table 3. This yields some basic stylized facts that help us understand the econometric results of the next section. In particular, we make the following findings:

- Current account deficits are negatively and significantly correlated with real income levels. In absolute values, the cross-country (long-run) correlation is higher than the pooled-data (short-run) correlation. The lowest correlations are registered for North Africa (-0.08 cross-country and –0.04 pooled) and sub-Saharan Africa (-0.17 cross-country and –0.09 pooled).

- Current account deficits are negatively and significantly linked with domestic growth rates in the pooled-data (short-run) sample, although such correlation is not significant in the cross-country (long-run) sample. However, the correlation for the cross-country sample is positive and significant for sub-Saharan Africa.[4] This is consistent with the expected response of the current account to an increase in the growth rate driven by permanent productivity shocks or investment shocks (Glick and Rogoff, 1995).

---

[3] Countries are assigned to regions according to standard World Bank classification.

[4] It is also positive but statistically nonsignificant for North Africa.

- Current account deficits are negatively correlated to private and public savings. Such correlation is higher for private than for public savings (-0.41 vs. -0.18 with cross-country, and -0.42 vs. -0.16 with pooled data). This empirical regularity also holds for Africa.

- The correlation between current account deficits and real exchange rate appreciation is positive and significant but low (approximately 0.09) for the pooled-data sample. This is consistent with the Mundell-Fleming prediction that a depreciation of the domestic currency (i.e., a decrease in the real exchange rate) helps reduce the current account deficit; again, however, the sign is reversed for sub-Saharan Africa.

- The correlation between current account deficits and terms of trade fluctuations is negative and significant in the pooled-data sample, but it is not significant in the cross-country sample. The short-run correlation is consistent with the Harberger-Laursen-Metzler effect, by which transitory improvements in the terms of trade help reduce current account deficits (Obstfeld, 1982; Svensson and Razin, 1983; and Mendoza, 1995). The long-run, correlation is consistent with the findings of Razin (1995) and Mendoza (1995) that permanent shocks to the terms of trade do not affect current account balance.

- There is no significant relationship between current account deficits and distortions (black market premium, exchange controls) in the external sector for the full sample, but there is a positive and significant relationship for the sub-Saharan Africa panel.[5]

- Current account deficits are significantly and positively correlated with aid inflows for both samples. The correlation is higher in the cross-country than in the pooled-data sample, thus implying that stronger current account effects might be expected with more persistent the EDA inflows. Interestingly, not only does the sign change for Sub-Saharan Africa, but this correlation also becomes nonsignificant for this region.

- The correlation between current account deficits and the growth rate for industrial economies is positive and significant with pooled data (0.32), while negative and significant (-0.15) for the cross-country sample. This appears to be consistent with the hypothesis that growth rates are driven by both permanent and transitory global shocks to the economy.

- The correlation between current account deficits and international real interest rate is not significant in either of the two samples.

---

[5] Also, balance of payments controls are positive and statistically significant for North Africa.

To summarize, the simple correlations between the current account deficit and its possible components appear to indicate that the forces that drive the deficits in Africa and, in particular, sub-Saharan Africa, may be different both qualitatively and quantitatively than those other regions, even when compared with the developing world as a whole.

## IV. Methodology

The equations specified for the empirical analysis include some explanatory variables that could be jointly endogenous, that is, correlated with the error term. In addition, unobserved country-specific factors may be correlated with the explanatory variables. Given these potential weaknesses in the empirical approach, our preferred method of estimation is the generalized method of moments (GMM) estimator for dynamic models of panel data, introduced by Arellano and Bover (1995) and Blundell and Bond (1997). This so-called GMM system estimator combines in a single system the regression equation in both changes and levels, each with its specific set of instrumental variables. Because of this capability, our model is designed to handle both pooled cross-country and time-series data. It is dynamic, since it allows for independent effects from the lagged current account deficit. Also, this approach allows for a "weak exogeneity" assumption with respect to the explanatory variables while preserving the estimator's properties.

The consistency of the GMM estimator depends on whether lagged values of the explanatory variables are valid instruments in the current account deficit regression. We address this issue by considering two specification tests suggested by Arellano and Bond (1991) and Arellano and Bover (1995). The first is a Sargan test of overidentifying restrictions, which tests the overall validity of the instruments by analyzing the sample analogue of the moment conditions used in the estimation process. Failure to reject the null hypothesis gives support to the model. The second test examines the hypothesis that the error term is not serially correlated. We test whether the differenced error term (that is, the residual of the regression in differences) is first-, second-, or third-order serially correlated. First-order serial correlation of this error term is expected even if the original error term (in levels) is uncorrelated, unless the latter follows a random walk. Second-order serial correlation of the differenced residual indicates that the original error term is serially correlated and follows a moving average process at least of order one. If the test fails to reject the null hypothesis of absence of second-order serial correlation, we conclude that the original error term is serially uncorrelated and use the corresponding moment conditions. Appendix I presents a detailed explanation of our approach.

## V. Regression Results

In this section, we analyze the determinants of current account deficits in Africa for the period 1975-95 using annual data. We will compare the regression results across two samples: a sample of developing countries and a sample of African countries. As mentioned

above, we use the Arellano-Bond-Bover-Blundell dynamic panel data techniques to control for joint endogeneity and correlated country-specific effects. The dependent variable is the current account deficit as a percentage of gross national disposable income, or *GNDI*. Somewhat similar to Calderón, et al. (1999), the determinants considered have been classified in three groups:[6] (a) domestic economy conditions, (b) external conditions, and (c) evolution of the world economy. In particular, the set of explanatory variables include the lagged value of the current account deficit, *CAD*, the domestic output growth rate, private and public savings (both expressed as a percentage of *GNDI*), exports (as a percentage of *GNDI*), the real effective exchange rate, the terms of trade, the extent of balance of payments controls, the black market premium, aid flows (effective development assistance), the output growth rate of industrial economies, and the international real interest rate. Given the frequency of the data used, our analysis mainly focuses on the transitory impact of changes in these variables on the current account deficit. This helps us to understand the short-run dynamics of the current account adjustment, as well as some medium-run implications for its sustainability in the context of African economies.[7] By using a GMM-IV system estimator (Arellano and Bover, 1995), we allow the explanatory variables to be jointly (weakly) endogenous, except for the terms of trade, the industrialized output growth rate, and the international real interest rate variables that in both our developing and African country samples are most likely to be exogenous. Results are presented in Table 4 (benchmark regressions are [1] and [1a]) and are discussed below.

**Persistence.** The lagged value of the current account deficit (*CAD*) is positive and significant (at 10 percent) but not very persistent (coefficient is 0.11).[8] Notice that the *CAD* for all developing countries (0.52) shows a much higher persistence than the process for African countries. This may be attributed to the greater likelihood of current account reversals in Africa (Milesi-Ferretti and Razin, 1998). The higher levels of external debt in the region (relative to other developing countries) may be linked to policies that, in aiming to speed up the adjustment of the external gap, generate current account reversals. Since the current account determines the accumulation in foreign debt, there will be a critical level of accumulation above which the expected growth of a country will not be perceived by foreign lenders to be sufficient to generate the necessary repayment flows; the deficits will have to revert.[9]

---

[6] The current account deficit, as defined in Table 1, implies that positive (negative) numbers indicate a deficit (surplus).

[7] That is, we are not decomposing for long-term, permanent effects.

[8] The value of the coefficient for lagged *CAD* implies that the half-life of transitory shocks on the current account deficit is about six years.

[9] The low persistence of current account deficits in Africa may be linked to the occurrence of the high levels of foreign debt in the context of the region's low growth. *CAD* in an African country is expected to be adjusted more quickly than in an average developing country as the

(continued...)

### A. Domestic economy

**Domestic output growth.** This variable has a different impact in the two samples. For developing countries, we find a positive and significant coefficient (see regression [1] of Table 4). This is consistent with a situation in which domestic absorption is increasing more than exports. The income elasticity of foreign goods may be low.[10] In contrast to the result for the sample of developing countries, the coefficient on domestic growth is negative and significant at the 10 percent level for the sample of African countries. A 1 percentage point rise in the GDP growth rate leads to decrease of about 0.22 percentage points in the current account deficit. This result is consistent with the predictions of the intertemporal approach to the current account, where domestic growth driven by transitory, country-specific productivity shocks might increase savings and, without investment effects, might help to reduce the current account deficit in Africa (Obstfeld and Rogoff, 1995).

**Public and private savings.** We find that the coefficients for both variables are negative and significant (at the 5 percent level) in both samples. For private savings, we find that the (absolute value of the) coefficient for African countries is almost two-and-a-half times larger than the coefficient for developing countries (-0.37 vs. -0.14, from regressions [1a] and [1] of Table 4). A transitory increase in private savings of 1 percent of *GNDI* may reduce the current account deficit by 0.41 percent. The larger impact generated by higher private savings is consistent with the idea that increases in consumption in Africa may be directly financed with a much higher proportion of foreign inflows than for the average developing country. However, the coefficient of public savings for African countries is twice as large as relative the one for the sample of developing countries (-0.41 vs. -0.20, from regressions [1a] and [1] of Table 4). The impact of a transitory increase in public savings of 1 percent of *GNDI* generates a reduction of *CAD* by 0.46 percentage point for African countries. The strong impact of increases in public savings on the current account suggests that IMF-designed programs, which usually employ fiscal consolidation as one of the tools to correct external imbalances, may be more effective in achieving the desired outcome in African countries.[11]

---

stock of debt makes an open position unsustainable, even in the very short term. This hypothesis is supported by the fact that, when debt is included among the regressors, the lagged *CAD* (persistence) becomes non significant. See column [3a] in Table 4.

[10]This is consistent with a situation in which "productive" imports are manufactured domestically. For instance, machinery might be tied to investment projects that are not sensitive to domestic conditions.

[11]The impact of public savings (and government expenditures) is larger than the impact of private savings on *CAD* in both samples. Countries with large (external and internal debts) have a greater need for adjustment; thus fiscal adjustments may affect even more the external gap. In other words, the strength of the link between the fiscal deficit and current account deficit depends on the level of debt of the country.

To further study the role of public savings, an additional experiment is conducted. We use central government expenditure (as a percentage of *GNDI*) instead of public savings in order to test whether a fiscal expansion (consolidation) is generated through a surge (decline) of government expenditure (regressions [4] and [4a] in Table 4). We find a positive and significant relationship between government expenditure and current account deficits. Although the "instantaneous-impact" coefficient is slightly larger for African economies (0.41 vs. 0.37), the total effect is larger for the sample of all developing countries. An increase of the government expenditure of 1 percent of *GNDI* leads to an increase of the current account deficit of 0.51 percentage point for African economies (vs. an increase of 0.74 percentage point for all developing countries). Although an increase in public savings is twice as effective in correcting imbalances in Africa, government expenditures have an impact only marginally greater on the current account than in the full sample of developing countries. Therefore, a reduction in public consumption may not cause a decline in interest rates, leaving investment unchanged and the full effect of the increase in savings may be passed through to the current account.

**Macroeconomic uncertainty.** This variable is proxied by the standard deviation of monthly consumer price inflation over the year (regressions [2] and [2a] in Table 4). The effect of uncertainty on the current account is negative for both samples but significant only for the sample of all developing countries, and its economic impact is quantitatively small. In general, this result is consistent with Ghosh and Ostry (1995), who argue that macroeconomic uncertainty lowers both investment and savings (via a *precautionary savings* motive) thus leading to a decline in the current account deficit. The full effect of uncertainty might already have been picked up by the savings variable itself.

### B. External Sector

**Openness.** (exports as percentage of *GNDI*). We find that the coefficients are not statistically significant for either of the two samples. They remain non significant even when excluding variables that are expected to be correlated, such as the real exchange rate, terms of trade, and growth rate of industrialized economies).[12] The effects of increased openness or increased foreign demand may be sufficiently represented by the appropriate variables in the regressions.

**Black market premium.** This variable is statistically significant for both samples. The black market premium may help reduce current account deficits for African countries. For instance, foreign exchange controls that increase the black market premium from 0 percent to 20 percent might lead to a reduction of current account deficits for African countries by 0.76 percentage point of *GNDI*.[13] The strong impact of the black market

[12] These additional regressions, though not reported, are available upon request.

[13] However, for the full sample, the direction of the effect is reversed. An equivalent increase in the black market premium will yield a reduction of 0.40 percent for the full sample.

premium suggests that capital and exchange controls are effective in isolating African countries from real shocks in the external sector and, by allowing domestic interest rate to diverge, may thus stimulate automatic-adjustment-type mechanisms.

**Balance of payments controls.** This variable does not yield statistically significant transitory effects at the 5 percent level for either of the two samples (similar to Debelle and Faruqee, 1996; and Calderón, Chong, and Loayza, 1999).[14] It appears that the effect is most likely to work through imperfect exchange rate flexibility. The impact of key external sector relative prices is proxied by the current account effects of both real exchange rate and terms of trade fluctuations.

**Terms of trade.** We find that the relationship between terms of trade and current account deficits is negative and statistically significant for both samples.[15] Although the instantaneous impact coefficient is almost similar for the developing and African country sample (-0.029 and -0.024, respectively), the total effect is larger for the developing country sample, where a 10 percent increase in the terms of trade generates a reduction of the current account deficit by 0.62 percentage point (vs. 0.27 percentage point for the African country sample). A positive change in the terms of trade is linked with an improvement in the current account, provided that the Marshall-Lerner conditions hold. This finding is also consistent with the well-known Harberger-Laursen-Metzler effect, which states that adverse transitory terms of trade shocks generate a decline in the ratio of current to permanent income and a deterioration of the savings and current account positions (Obstfeld, 1982; Svensson and Razin, 1983; and Mendoza, 1995) .

**Real effective exchange rate.** We find a significant relationship between this variable and the current account deficit for African countries, in line with the predictions of standard open economy (Mundell-Fleming) models, whereas we find the predicted positive relationship although statistically insignificant for the full sample of countries. For African countries, a 10 percent temporary decrease in the real effective exchange rate (i.e., a transitory depreciation of the domestic currency) reduces the current account deficit by 0.41 percentage point (vs. a reduction of 0.12 percentage point for the full sample). An appreciation of the real exchange rate may have adverse consequences for the current account deficit, and unlike in the full sample of developing countries, the effect in Africa may be stronger that that of the terms of trade. Real exchange rate movements may have a stronger impact on the current account deficit of African countries because exports of African countries appear to be more price sensitive than developing countries as a whole.

---

[14] However, the developing country sample is significant at 10 percent. Notice that our proxy for balance of payment controls exhibits small variation over time and does not measure accurately the intensity of controls, only their presence (Grilli and Milesi-Ferreti, 1995).

[15]Terms of trade are constructed from price indexes (in U.S. dollars) for exports and imports from the World Bank (1997).

This is consistent with the fact that African countries tend to export primary commodities and thus face relatively elastic international demand. While in developing countries as a whole exchange rate policy is not statistically significant, as the only effect on the *CAD* may be through shocks in the terms of trade, in Africa the strong impact of the real exchange rate, which is additional to the impact of the terms of trade, may indicate that there may be some room for exchange rate policy to influence current account behavior, at least in the short term.

**International aid.** We find that aid flows (as proxied by the ratio of effective development assistance to *GDI*) might help close the external gap. That is, the coefficient of aid flows is negative and significant at the 5 percent level for both samples. This result is consistent whether we control for savings or not. Thus, it is consistent with the findings of Boone (1996) that all aid flows are devoted to increasing consumption patterns. Given that the savings effect of aid inflows is controlled for in the regression, aid inflows to developing economies increase the disposable income, possibly generating a trade-off with declining investment levels. In addition, this increase in disposable income would put upward pressure on domestic interest rates, thus, encouraging domestic savings and discouraging investment (and establishing a negative relationship with current account deficits).

**External debt**. To test the impact of external indebtedness, we include an additional regressor to our benchmark regression in both samples. We add the ratio of total external debt to GNP lagged one period (see regressions [3] and [3a] in Table 4). The idea is to explore whether high levels of indebtedness today will generate an adjustment in the external gap in the future (i.e., we expect a negative coefficient). With the exception of the coefficients of public savings, private savings, and terms of trade, the other regressors lose significance and even change signs. Collinearity of this variable with the other regressors appears to be a problem. The high debt levels in Africa may therefore be a reflection of the need for adjustment.

### C. Evolution of World Economy

Finally, we test the effect of the evolution of the world economy on the current account. First, we find that a temporary increase in the growth rate of industrial economies leads to a decline in the current account deficit for both samples; however, the impact is larger for the sample of all developing economies, where an increase of 1 percent in the industrial country growth rate lowers the *CAD* by 0.2 percentage point.[16] However, once we include ancillary variables ([2a]-[4a] in Table 4) the sign of the coefficient on growth rate of industrial economies loses significance (but becomes positive). Second, we find a negative and significant relationship (10 percent) between the international real interest rate and current account deficits for both samples (regressions [1] and [1a] in Table 4). This result is

[16]Temporary output surges in industrial economies lead to a reduction of current account deficits of African economies because of the increasing demand for their exports.

consistent with the impact of international interest rate fluctuations on current account deficits for net foreign debtors (as most African economies are). We find that the total impact of international interest rate fluctuations on African economies is approximately one-and-one-half times as high as the impact on all developing countries, perhaps a reflection of the high levels of debt in the region. A temporary rise in the international real interest rates of 1 percentage point might lead to a decline of the current account deficit of approximately 0.46 percentage point for African countries (vs. a 0.30 percentage point reduction for the whole sample).

Also in Table 4 notice that the specification tests support the GMM system panel estimator for all the regressions. First, the Sargan test of overidentifying restrictions cannot reject the null hypothesis that the instruments are not correlated with the error term. Second, serial correlation tests clearly reject the null hypothesis that the differenced error term is not first-order serially correlated, whereas they could not reject the presence of second- or third-order serial correlation. In short, both specification tests support the use of appropriate lags of the explanatory variables as instruments for estimation.

## VI. Is The Current Account Deficit "Excessive" in Africa ?

In order to evaluate the contribution of the determinants to current account deficits in Africa, we calculate fitted values for the current account deficits, using both the sample of developing countries and the sample of African countries (i.e., using the coefficient estimates from equations [1] and [1a] in Table 4. These fitted values and the contribution to current account fluctuations from external, internal, and world economy conditions are reported in Table 5. This information is summarized in Table 6. Using the above, we investigate in this section whether the current account deficits are "excessive," defined as the difference between the actual and the estimated fitted values. Although we do such a calculation for both the full developing country sample (equation [1]) and the sample of African countries (equation [1a]), we present and analyze in the text the estimates of the first only, as they give a better idea of the evolution of the fundamentals for the developing economies.[17] Although the coefficients of equation [1a] give a better grasp of the impact of policy changes on current account deficits in African countries, estimates based on those coefficients would give misleading (that is, biased) information regarding the equilibrium levels of the current account deficit for the spectrum of developing economies.

In Table 6, we find that current account deficits are excessive in Africa. They are more than 2 percent of *GNDI* over the "equilibrium" level (as calculated using the developing country sample). However, the behavior of current account deficits differs across regions. The excessiveness of African current account deficits is primarily driven by the external imbalances of sub-Saharan Africa, where the current account deficits are almost 3 percent of *GNDI* above the equilibrium level. Note that, regardless of the regression equation used, the

[17] Easterly, Loayza, and Montiel (1997) follow a similar approach.

same qualitative pattern of excessive current account deficits can be seen but the deviations from equilibrium are smaller when we use equation [1a]. Finally, even though the actual level of the current account deficits for North African countries is lower than the average for all developing countries, it is still significant (with the actual value being equal to 6 percent of *GNDI*). Across all the countries of north Africa, the behavior of the current account deficits is similar. Although these countries registered high levels of *CAD* (between 5 and 7 percent of *GNDI*), these deficits are below their equilibrium levels. However, the behavior of *CAD* across sub-Saharan African countries is more heterogeneous. Of the 27 countries reported in Table 5, 14 reported positive imbalances ("excessive" deficits; see the difference between predicted and actual values column when using equation [1] in Table 4). Among the countries with the highest (positive) imbalance are Zaire (8.01), Madagascar (7.63), Central African Republic (7.21), Sudan (6.29), and Ghana (6.25). In contrast, countries such as Cameroon, Côte d'Ivoire, Gambia, Malawi, Sierra Leone and Zambia registered high current account deficits (above 7 percent of GNDI), but their gaps relative to the equilibrium level is small. Finally, from the decomposition of the current account fluctuations (using equation [1] in Table 4), we find that both internal conditions and the evolution of the world economy have helped close the external gap, while the external conditions (as an overall component) have broadly kept the deficit invariant. However, much of the deficit should be attributed to idiosyncratic factors specific to the African region (i.e. country effects). Note that this situation changes drastically if we conduct our analysis using equation [1a] in Table 4 as our benchmark of decompositions.

## VII. Summary and Conclusions

In this paper we had two objectives. First, to understand the key determinants of current account deficits in Africa and how they compare with those of the developing world, and, second, to assess whether such current account deficits are "excessive," defined as the difference between the actual and estimated fitted values obtained. On the first front, we show that for several key determinants Africa is, indeed, different. Specifically, we find that with respect to the African countries, (a) there is not as much persistence in current account deficits as in the full sample of developing countries, probably because the chances of reversals are greater; (b) unlike in the full sample of developing countries, domestic output growth is positively linked with current account deficits, possibly as a result of differences in income elasticity; (c) the impact of private savings on current account deficits is larger than in other regions, which is consistent with the idea that increases in consumption in Africa may be financed by foreign inflows to a larger extent; (d) fiscal consolidation of IMF-designed programs may be more effective than elsewhere as the impact of public savings on the current account deficit is larger in Africa than in the average developing country; the larger the debt level, the stronger the fiscal impact; (e) macroeconomic uncertainty, openness, and balance of payment controls, are not statistically significant; (f) the high level of debt appears to signal the need for adjustment; (g) aid flows help close the external gap; (h) unlike in the average developing country, a depreciation of the currency reduces the current account deficit, at least in the short run; and (i) the impact of the terms of trade is consistent with the Harberger-Laursen-Metzler effect.

Based on the findings of the first section, we are able to calculate whether the current account deficit in Africa is "excessive" with respect to the fundamentals, as estimated from the full sample of developing countries. In fact, we conclude that the current account deficit is almost 3 percent of the gross national disposable income above the equilibrium level. Both, internal conditions and global changes in the world economy have helped reduce the external gap, but it appears that much of the current account deficit imbalance with respect to equilibrium is country specific. Our findings above open at least one possible path for future research. Since we have used annual data for the period 1975-95, we have mostly captured the transitory "short-run" effects of changes in policy variables. We cannot say much about permanent, long-run effects that deal with current account sustainability. The obvious question is to ask whether Africa is also different with respect to permanent effects, not just transitory shocks. If so, a key issue is to investigate whether the long-run current account deficit is "excessive" or not.

## References

Alonso-Borrego, Cesar, and Manuel Arellano, 1999, "Symetrically Normalized Instrumental-Variable Estimation Using Panel Data," *Journal of Business and Economic Statistics*, Vol. 17 (January 1999), pp. 36-49.

Arellano, Manuel, and Stephen Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies,* Vol 58 (April): pp. 277-97.

Arellano, Manuel, and Olympia Bover,1995, "Another look at the Instrumental Variable Estimation of Error-Component Models," *Journal of Econometrics 68*: pp. 29-51.

Blundell, Richard and Stephen Bond,1997, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," Discussion Papers in Economics n. 97-07 (London: University College).

Boone, Peter, (1996), "First Aid for the Aid Budget," *Economic Affairs* (U.K.); Vol 16 (Autumn): pp. 23-6.

Calderón, César, Alberto Chong, and Norman Loayza, 1999, "Determinants of Current Account Deficits in Developing Countries," Policy Research Working Paper, The World Bank (Washington: The World Bank).

Cashin, Paul, and John McDermott,1998, "Are Australia's Current Account Deficits Excessive?" *Economic Record, forthcoming.*

Chang, Charles, Eduardo Fernandez-Arias and Luis Serven, 1999, "Measuring Aid Flows, A New Approach," World Bank, Policy Research Working Paper n. 2050 (Washington: World Bank).

Collier, Paul, and Jan Willem Gunning, 1999 "Explaining African Economic Performance," Journal of Economic Literature, vol. 37, n1 (March), pp. 64-111.

Debelle, Guy, and Hamid Faruqee, 1996, "What Determines the Current Account? A Cross-Sectional and Panel Approach," IMF Working Paper 96/58 (Washington: International Monetary Fund).

Easterly, William, Norman Loayza, and Peter Montiel, 1997, "Has Latin America's Post-Reform Growth Been Disappointing?" *Journal of International Economics,* Vol. 43 (November), pp. 287-311.

Easterly, William and Ross Levine,1997 "Africa's Growth Tragedy: Policies and Ethnic Diversities," *Quarterly Journal of Economics* Vol. 112 (November) pp.1203-50.

Frenkel, Jacob A. and Assaf Razin, 1996, *Fiscal Policies and Growth in the World Economy* (Cambridge, Mass.: M.I.T. Press).

Glick, Reuven, and Kenneth Rogoff, 1995, "Global versus Country-Specific Productivity Shocks and the Current Account," *Journal of Monetary Economics* Vol. 35 (February): pp. 159-92.

Ghosh, Atish 1995, "International Capital Mobility Amongst the Major Industrialized Countries: Too Little or Too Much?" *The Economic Journal, 105*: pp. 107-128.

Ghosh, Atish, and Jonathan Ostry, 1995, "The Current Account in Developing Countries: A Perspective from the Consumption-Smoothing Approach," *World Bank Economic Review,* Vol 9 (February): pp. 305-33.

Grilli, Vittorio, and Gian Maria Milesi-Ferreti, 1995, "Economic Effects and Structural Determinants of Capital Controls," *Staff Papers*, International Monetary Fund, Vol. 42 (September), pp. 517-551.

Holtz-Eakin, Douglas, Whitney Dewey, and Harvey S. Rosen, "Estimating Vector Autoregressions with Panel Data," *Econometrica,* Vol. 56 (November), pp. 1371-95.

International Monetary Fund (various years), *International Finance Statistics*.

Kiviet, Jan F.,1995, "On Bias, Inconsistencies, and Efficiency of Various Estimators in Dynamic Panel Data Models," *Journal of Econometrics*, Vol. 68 (July), pp. 53-78.

Leiderman, Leonardo, and Assaf Razin, 1991, "Determinants of External Imbalances: The Role of Taxes, Government Spending and Productivity," *Journal of the Japanese and International Economies,* Vol. 5 (December), pp. 421-50.

Loayza, Norman, Humberto López, Klaus Schmidt-Hebbel, and Luis Servén, 1998, "The World Saving Database," (Unpublished; Washington: The World Bank).

Mansoorian, Arman,1998, "Habits and Durability in Consumption, and the Dynamics of the Current Account," *Journal of International Economics*, 44: pp. 69-82.

Mendoza, Enrique G., 1991, "Capital Controls and the Gains from Trade in a Business Cycle Model of a Small Open Economy," *Staff Papers* 38 International Monetary Fund, Vol.38 (September), pp. 480-505.

_____, 1995, "The Terms of Trade, the Real Exchange Rate, and Economic Fluctuations," *International Economic Review*, Vol. 36 (February), pp. 101-37.

Milesi-Ferreti, Gian Maria and Assaf Razin, 1998, "Current Account Reversals and Currency Crises: Empirical Regularities," NBER Working Paper n. 6620 (Cambridge, Massachussets: National Bureau of Economic Research).

Obstfeld, Maurice, 1982, "Aggregate Spending and the Terms of Trade: Is There a Laursen-Harberger-Metzler Effect?" *Quarterly Journal of Economics,* Vol 97 (May), pp. 251-70.

_____ and Kenneth Rogoff,1995, "The Intertemporal Approach to the Current Account," *Handbook of International Economics,* Vol. 3, ed. by Gene Groomsman and Kenneth Rogoff (Amsterdam: North-Holland).

Razin, Assaf, 1995, "The Dynamic-Optimizing Approach to the Current Account: Theory and Evidence," *Understanding Interdependence: The Macro-economics of the Open Economy*", ed. by Peter Kenen (Princeton, New Jersey, Princeton University Press), pp 169-98.

Sachs, Jeffrey, 1982, "The Current Account in the Macroeconomic Adjustment Process," *Scandinavian Journal of Economics,* Vol. 84 (n. 2), pp.147-59.

Sheffrin, Steven and Wing Thye Woo, 1990, "Present Value Tests of an Intertemporal Model of the Current Account," *Journal of International Economics, 29*: pp. 237-53.

Stockman, Alan, 1987, "The Equilibrium Approach to Exchange Rates," *Federal Reserve Bank of Richmond Economic Review,* March-April, pp. 12-31.

Svensson, Lars E. O. and Assaf Razin, 1983, "The Terms of Trade and the Current Account: The Harberger-Laursen-Metzler Effect," *Journal of Political Economy,* Vol. 91 (February), pp. 97-125.

Tornell, Aaron, and Philip Lane, 1998, "Are Windfalls a Curse? A Non-Representative Agent Model of the Current Account and Fiscal Policy," *Journal of International Economics,* Vol.44 (February), pp. 83-112.

Wood, Adrian,1988, "Global Trends in Real Exchange Rates, 1960-84," World Bank Discussion Paper 35.

World Bank, 1997, *World Development Indicators, 1997* (Washington: World Bank), available on CD-ROM.

_____,1998, *Assessing Aid: What Works, What Doesn't and Why* (New York: Oxford University Press for the World Bank).

Ziliak, J. (1997) "Efficient Estimation with Panel Data When Instruments Are Predetermined: An Empirical Comparison of Moment-Condition Estimators," *Journal of Business Economics and Statistics*, 15 (4).

Table 1. Description of Variables

| Variable | Description | Sources |
|---|---|---|
| Current account deficit (*CAD*) | Current account deficit as a percentage of gross national disposable income (*GNDI*). *GNDI* is equal to *GNP* plus all net unrequited transfers. *CAD* > 0 (< 0) indicate a deficit (surplus) in the current account balance. | Loayza and others (1998) |
| Gross national savings (*GNS*) | *GNS* is equal to *GNDI* minus consumption expenditure | Loayza and others (1998) |
| Private and public savings | The definition of government we use is the central government (this excludes non-financial public enterprises). We use data adjusted for capital gains and losses due to inflation. Percentage of *GNDI* | Loayza and others (1998) |
| Real effective exchange rate (REER) | *REER* is the multilateral real exchange rate computed using the following formula: $REER = \frac{(P/e)}{\prod_k (P_k/e_k)^{\delta_k}}$, where e is the exchange rate (in unit of local currency per US$) and P is the consumer price index CPI of the domestic country, ek and Pk are exchange rates and CPIs for trading partners respectively. The δ coefficients represent IMF-generated weights based on both bilateral trade shares and export similarity. An increase in *REER* indicates a real appreciation of the domestic currency. | IMF, - *International Financial Statistics* (*IFS*). World Bank - *World Development Indicators* (*WDI*). |
| Terms of trade (TOT) | Terms of trade is computed as the ratio of export prices to import prices (base 1987 = 100) | World Bank – *WDI* |
| Exports (X) | We consider the ratio of exports to *GNDI* as our measure of openness. | Loayza and others (1998) World Bank – *WDI* |
| Exchange controls (EXCC) | Average of three dummy variables that capture restrictions on current and capital account transactions, as well as multiple exchange rate regimes. | Grilli and Milesi-Ferreti (1995) |
| Black market premium (BMP) | Black market premium on foreign exchange (*BMP*) is the ratio of the parallel to the official exchange rate. We use log (*1 + BMP*). | Wood (1988) for period 1960-88. International Currency Analysis Inc. (various years) after 1988. |
| Aid (*EDA*) | Aid is proxied by the ratio of effective development assistance (*EDA*) to Gross domestic investment (*GDI*). *EDA* is an aggregate measure of aid flows combining total grants and the grant component of all official loans | Chang and others (1998) World Bank – *WDI*. |
| External Debt | External debt is measured by the ratio of total external debt (*EDT*) to gross national product (*GNP*) | World Bank – *WDI*. |
| Macroeconomic Uncertainty | Macroeconomic uncertainty is proxied by the standard deviation of monthly CPI inflation. | IMF – *IFS*. |
| Industrialised output growth | The growth rate for industrial economies is computed from the (population-weighted) real GDP (in constant US$) of OECD economies. | IMF – *IFS*. World Bank – *WDI*. |
| International real interest rate | To compute this variable, we use the nominal eurodollar London rate (as proxy for the nominal international rate) and the CPI percentage change for industrial countries (as proxy for external inflation). | IMF – *IFS*. |

Table 2. Summary Statistics

| | Current Account Deficit (% GNDI) | Domestic Output Growth Rate | Savings (% GNDI) 1/ | | Exports (%GNDI) | Black Market Premium 2/ | Exchange Controls 3/ | Effect. Develop. Assist. (%GDI) |
|---|---|---|---|---|---|---|---|---|
| | | | Private | Public | | | | |
| **Latin America** | **0.040** | **0.027** | **0.138** | **0.033** | **0.252** | **0.230** | **0.551** | **0.035** |
| **East Asia** | **0.020** | **0.063** | **0.232** | **0.046** | **0.351** | **0.143** | **0.304** | **0.016** |
| **South Asia** | **0.022** | **0.053** | **0.149** | **0.038** | **0.153** | **0.247** | **0.572** | **0.116** |
| **North Africa** | **0.033** | **0.041** | **0.141** | **0.065** | **0.282** | **0.352** | **0.707** | **0.037** |
| Egypt | 0.073 | 0.062 | 0.117 | 0.053 | 0.207 | 0.069 | 1.000 | 0.073 |
| Morocco | 0.060 | 0.040 | 0.145 | 0.036 | 0.211 | 0.057 | 0.842 | 0.040 |
| Tunisia | 0.048 | 0.039 | 0.168 | 0.057 | 0.379 | 0.065 | 0.583 | 0.033 |
| **sub-Saharan Africa** | **0.059** | **0.028** | **0.083** | **0.035** | **0.219** | **0.373** | **0.658** | **0.244** |
| Cent. Afr. Rep. | 0.044 | 0.007 | 0.017 | 0.044 | 0.194 | 0.025 | 0.578 | 0.399 |
| Cameroon | 0.079 | 0.034 | 0.108 | 0.055 | 0.177 | 0.024 | 0.439 | 0.060 |
| Ethiopia | 0.017 | 0.023 | 0.079 | 0.013 | 0.088 | 0.998 | 0.733 | 0.535 |
| Ghana | 0.020 | 0.016 | 0.042 | 0.034 | 0.218 | 0.965 | 0.933 | 0.255 |
| Kenya | 0.047 | 0.038 | 0.173 | 0.012 | 0.252 | 0.145 | 0.702 | 0.085 |
| Mauritius | 0.045 | 0.046 | 0.179 | 0.037 | 0.587 | 0.052 | 0.784 | 0.042 |
| Niger | 0.027 | 0.013 | 0.088 | 0.032 | 0.243 | 0.027 | 0.481 | 0.375 |
| Nigeria | 0.036 | 0.035 | 0.141 | 0.037 | 0.327 | 0.617 | 0.786 | 0.000 |
| Rwanda | 0.015 | 0.035 | 0.082 | 0.034 | 0.057 | 0.360 | 0.667 | 0.264 |
| Sudan | 0.087 | 0.052 | 0.057 | 0.023 | 0.053 | 0.472 | 0.889 | 0.137 |
| Sierra Leone | 0.109 | -0.001 | 0.009 | 0.014 | 0.211 | 0.574 | 0.574 | 0.180 |
| Uganda | 0.017 | 0.039 | 0.045 | 0.047 | 0.061 | 0.646 | 0.697 | 0.365 |
| Zaire | 0.047 | 0.000 | 0.073 | 0.014 | 0.192 | 0.591 | 0.689 | 0.102 |
| Zimbabwe | 0.036 | 0.033 | 0.143 | 0.032 | 0.283 | 0.472 | 0.929 | 0.051 |

1/ Private and public savings are calculated using data for central government.
2/ Calculated as log(1+variable).
3/ Calculated as the simple average of dummies for presence of current or capital controls, and multiple exchange rate regimes.

Table 3. Cross-Country and Panel Correlations Between CAD and Regressors 1/2/.

| | Developing | | Latin America | | East Asia | | North Africa | | South Asia | | Sub Sah Africa | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cross-country | Panel | Cross-country | Panel | Cross-country | Panel | Cross-country | Panel | Cross-country | Panel | Cross-country | Panel |
| **Domestic** | | | | | | | | | | | | |
| GDP (logs) | -0.417 | -0.262 | -0.437 | -0.231 | -0.955 | -0.298 | -0.083 | -0.037 | -0.334 | -0.227 | -0.171 | -0.099 |
| | (0.00) | (0.00) | (0.05) | (0.00) | (0.00) | (0.00) | (0.85) | (0.68) | (0.52) | (0.02) | (0.42) | (0.06) |
| GDP growth | -0.007 | -0.063 | 0.233 | -0.043 | -0.749 | -0.289 | 0.104 | 0.085 | 0.047 | 0.029 | 0.428 | 0.025 |
| | (0.96) | (0.04) | (0.32) | (0.40) | (0.09) | (0.00) | (0.81) | (0.34) | (0.93) | (0.77) | (0.04) | (0.64) |
| Private savings | -0.406 | -0.416 | -0.156 | -0.372 | -0.738 | -0.569 | -0.655 | -0.490 | -0.172 | -0.249 | -0.130 | -0.299 |
| (% GNDI) 3/ | (0.00) | (0.00) | (0.51) | (0.00) | (0.09) | (0.00) | (0.08) | (0.00) | (0.74) | (0.01) | (0.54) | (0.00) |
| Public Saving | -0.176 | -0.156 | -0.292 | -0.207 | -0.696 | -0.195 | -0.192 | -0.231 | 0.763 | 0.389 | -0.066 | -0.082 |
| (% GNDI) 3/ | (0.16) | (0.00) | (0.21) | (0.00) | (0.12) | (0.05) | (0.65) | (0.01) | (0.08) | (0.00) | (0.76) | (0.12) |
| **External** | | | | | | | | | | | | |
| Exports | 0.082 | 0.034 | 0.381 | 0.104 | 0.439 | 0.012 | -0.120 | -0.143 | 0.596 | 0.402 | 0.101 | 0.089 |
| (% GNDI) | (0.52) | (0.27) | (0.10) | (0.04) | (0.38) | (0.90) | (0.78) | (0.11) | (0.21) | (0.00) | (0.64) | (0.10) |
| REER (logs) | -0.031 | 0.087 | 0.311 | 0.223 | -0.091 | -0.010 | 0.426 | 0.439 | -0.777 | -0.263 | -0.254 | -0.116 |
| | (0.81) | (0.00) | (0.18) | (0.00) | (0.86) | (0.92) | (0.29) | (0.00) | (0.07) | (0.01) | (0.23) | (0.03) |
| Terms of | -0.095 | -0.128 | -0.407 | -0.225 | 0.614 | -0.096 | 0.363 | 0.069 | 0.190 | -0.024 | -0.102 | -0.157 |
| Trade (logs) | (0.46) | (0.00) | (0.07) | (0.00) | (0.20) | (0.33) | (0.38) | (0.43) | (0.72) | (0.81) | (0.64) | (0.00) |
| BMP 4/ | 0.154 | 0.030 | -0.009 | -0.054 | -0.441 | 0.000 | -0.357 | 0.119 | 0.049 | -0.005 | 0.334 | -0.018 |
| | (0.22) | (0.32) | (0.97) | (0.29) | (0.38) | (1.00) | (0.39) | (0.18) | (0.93) | (0.96) | (0.11) | (0.74) |
| BoP cont 5/ | 0.04 | 0.00 | -0.19 | -0.10 | -0.28 | -0.05 | 0.32 | 0.38 | -0.30 | -0.15 | 0.12 | -0.03 |
| | (0.75) | (0.94) | (0.42) | (0.06) | (0.59) | (0.62) | (0.44) | (0.00) | (0.56) | (0.13) | (0.58) | (0.55) |
| Aid (%GDI) | 0.266 | 0.108 | 0.366 | 0.151 | 0.813 | 0.268 | 0.821 | 0.322 | 0.096 | 0.086 | -0.007 | -0.077 |
| | (0.03) | (0.00) | (0.11) | (0.00) | (0.05) | (0.01) | (0.01) | (0.00) | (0.86) | (0.37) | (0.97) | (0.15) |
| **World Economy**: | | | | | | | | | | | | |
| Indstr. output | 0.076 | -0.088 | -0.146 | -0.170 | -0.461 | -0.071 | 0.415 | 0.048 | 0.336 | -0.032 | -0.003 | -0.122 |
| (in logs) | (0.55) | (0.00) | (0.54) | (0.00) | (0.36) | (0.47) | (0.31) | (0.59) | (0.51) | (0.74) | (0.99) | (0.02) |
| Indstr. output | 0.319 | -0.150 | -0.079 | -0.202 | 0.853 | -0.313 | 0.090 | -0.025 | 0.390 | -0.143 | 0.380 | -0.124 |
| Growth rate | (0.01) | (0.00) | (0.74) | (0.00) | (0.03) | (0.00) | (0.83) | (0.78) | (0.44) | (0.14) | (0.07) | (0.02) |
| Intl. int. rate 4/ | 0.070 | 0.053 | -0.098 | 0.047 | -0.018 | 0.247 | 0.306 | 0.064 | 0.264 | -0.061 | -0.005 | 0.002 |
| | (0.58) | (0.08) | (0.68) | (0.36) | (0.97) | (0.01) | (0.46) | (0.47) | (0.61) | (0.53) | (0.98) | (0.96) |

1/ Standard errors in parenthesis.

2/ CAD expressed as percentage of GNDI.

3/ Private and public saving are calculated using data for central government.

4/ Calculated as log(1+variable).

5/ Calculated as the simple average of dummies for presence of current or capital controls, and multiple exchange rate regimes.

Table 4. Determinants of CAD in Africa and in All Developing Countries, 1975-95 1/

| | [1] | | [1a] | | [2] | | [2a] | | [3] | | [3a] | | [4] | | [4a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LDCs | | Africa | | LDCs | | Africa | | LDCs | | Africa | | LDCs | | Africa | |
| Constant | 0.030 | | -0.038 | | -0.018 | | -0.060 | | -0.012 | | 0.383 | | -0.050 | | -0.043 | |
| | (0.059) | | (0.068) | | (0.065) | | (0.075) | | (0.074) | | (0.139) | | (0.055) | | (0.076) | |
| CAD lagged | 0.519 | 2/ | 0.109 | 3/ | 0.482 | 2/ | 0.158 | 2/ | 0.476 | 2/ | 0.021 | | 0.501 | 2/ | 0.199 | 2/ |
| | (0.061) | | (0.073) | | (0.045) | | (0.062) | | (0.054) | | (0.048) | | (0.059) | | (0.062) | |
| **Domestic** | | | | | | | | | | | | | | | | |
| Domestic | 0.107 | 3/ | -0.192 | 3/ | 0.037 | | -0.276 | 2/ | 0.086 | | 0.116 | | 0.082 | | -0.181 | 2/ |
| output growth | (0.068) | | (0.115) | | (0.075) | | (0.096) | | (0.071) | | (0.086) | | (0.078) | | (0.083) | |
| Rate | | | | | | | | | | | | | | | | |
| Private savings | -0.143 | 2/ | -0.368 | 2/ | -0.132 | 2/ | -0.440 | 2/ | -0.278 | 2/ | -0.618 | 2/ | -0.117 | 3/ | -0.170 | 2/ |
| | (0.066) | | (0.086) | | (0.052) | | (0.115) | | (0.073) | | (0.091) | | (0.071) | | (0.045) | |
| Public savings | -0.202 | 2/ | -0.409 | 2/ | -0.218 | 2/ | -0.374 | 2/ | -0.240 | 2/ | -0.531 | 2/ | | | | 2/ |
| | (0.060) | | (0.099) | | (0.063) | | (0.060) | | (0.068) | | (0.052) | | | | | |
| Gov exp/GNDI | | | | | | | | | | | | | 0.368 | 2/ | 0.408 | |
| | | | | | | | | | | | | | (0.103) | | (0.106) | |
| Macroeconomic | | | | | -0.000 | 2/ | -0.000 | | | | | | | | | |
| Uncertainty | | | | | (0.000) | | (0.000) | | | | | | | | | |
| **External** | | | | | | | | | | | | | | | | |
| Exports/GNDI | 0.003 | | 0.006 | | 0.012 | | 0.029 | | 0.073 | 2/ | 0.046 | | -0.018 | | 0.028 | |
| | (0.022) | | (0.047) | | (0.022) | | (0.062) | | (0.022) | | (0.064) | | (0.029) | | (0.052) | |
| REER | 0.006 | | 0.036 | 2/ | 0.015 | | 0.038 | 2/ | 0.017 | | -0.045 | | 0.010 | | 0.007 | |
| | (0.012) | | (0.016) | | (0.013) | | (0.016) | | (0.014) | | (0.031) | | (0.011) | | (0.021) | |
| Terms of trade | -0.030 | 2/ | -0.024 | 2/ | -0.032 | 2/ | -0.011 | | -0.029 | 2/ | -0.027 | 2/ | -0.038 | 2/ | -0.066 | 2/ |
| | -0.005 | | -0.009 | | -0.006 | | -0.016 | | -0.007 | | -0.012 | | -0.006 | | -0.014 | |
| Black market | 0.010 | 3/ | -0.034 | 2/ | 0.003 | | -0.031 | 2/ | 0.009 | | 0.014 | | 0.003 | | 0.002 | |
| premium | (0.007) | | (0.013) | | (0.008) | | 0.008 | | (0.008) | | (0.021) | | (0.008) | | (0.015) | |
| BoP Controls | -0.009 | 3/ | -0.005 | | -0.002 | | 0.004 | | 0.000 | | 0.012 | | 0.000 | | -0.001 | |
| | (0.006) | | (0.011) | | 0.007 | | (0.010) | | (0.006) | | (0.008) | | (0.007) | | (0.011) | |
| Eff. dev. | -0.024 | 2/ | -0.035 | 2/ | -0.023 | 2/ | -0.041 | 2/ | -0.033 | 2/ | -0.010 | | -0.021 | 3/ | -0.007 | |
| assistance | (0.012) | | (0.010) | | 0.010 | | (0.014) | | (0.011) | | (0.012) | | (0.013) | | (0.009) | |
| Debt/ GNP | | | | | | | | | -0.011 | | -0.100 | 2/ | | | | |
| Lagged | | | | | | | | | (0.010) | | (0.014) | | | | | |
| **World economy** | | | | | | | | | | | | | | | | |
| Industrial output | -0.346 | 2/ | -0.201 | 3/ | -0.363 | 3/ | 0.007 | | -0.311 | 3/ | 0.152 | | -0.357 | 2/ | 0.053 | |
| growth rate | (0.066) | | (0.139) | | (0.072) | | (0.250) | | (0.072) | | (0.176) | | (0.072) | | (0.286) | |
| International real | -0.143 | 3/ | -0.408 | 3/ | -0.170 | 2/ | -0.344 | 3/ | -0.289 | 3/ | -0.294 | 3/ | -0.030 | | -0.040 | |
| interest rate | (0.089) | | (0.225) | | (0.089) | | (0.189) | | (0.080) | | (0.195) | | (0.100) | | (0.286) | |
| Countries | 64 | | 30 | | 61 | | 29 | | 63 | | 30 | | 64 | | 30 | |
| Observations | 759 | | 302 | | 710 | | 282 | | 739 | | 302 | | 742 | | 301 | |
| Sargan test | 0.266 | | 0.569 | | 0.205 | | 0.510 | | 0.207 | | 0.556 | | 0.250 | | 0.472 | |
| Serial | | | | | | | | | | | | | | | | |
| Correlation test | | | | | | | | | | | | | | | | |
| 1st Order | 0.000 | | 0.089 | | 0.000 | | 0.058 | | 0.000 | | 0.019 | | 0.000 | | 0.006 | |
| 2nd Order | 0.918 | | 0.744 | | 0.887 | | 0.744 | | 0.883 | | 0.380 | | 0.420 | | 0.655 | |
| 3rd Order | 0.794 | | 0.273 | | 0.580 | | 0.236 | | 0.382 | | 0.522 | | 0.926 | | 0.202 | |

1/Standard errors in parentheses.

2/ Significant at a 5 percent confidence interval.

3/ Significant at a 10 percent confidence interval.

# Table 5. Decomposition of CAD Fluctuations in Africa, 1975-95 1/

| | Period | Sources of CAD Fluctuations (Using Eq.(1) in Table 4) | | | | | | | Sources of CAD Fluctuations [Using eq.(1a) in Table 4] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dom. econ. | Ext. eff. | World econ | Country effect | CAD (% GNDI) Predict. | Actual | Diff. | Dom. econ. | Ext. eff. | World econ | Country effect | CAD (% GNDI) Predict | Actual | Diff. |
| **North Africa** | | | | | | | | | | | | | | | |
| Egypt | 75-94 | -0.01 | 0.00 | -0.01 | 0.16 | 0.11 | 0.07 | -0.0402 | -0.03 | 0.03 | -0.01 | 0.01 | 0.08 | 0.07 | -0.0058 |
| Morocco | 75-93 | -0.02 | 0.01 | -0.01 | 0.09 | 0.06 | 0.06 | -0.0030 | -0.03 | 0.03 | -0.01 | -0.03 | 0.06 | 0.06 | -0.0018 |
| Tunisia | 83-94 | -0.02 | 0.01 | -0.01 | 0.12 | 0.08 | 0.05 | -0.0276 | -0.03 | 0.03 | -0.01 | -0.01 | 0.05 | 0.05 | -0.0037 |
| **Sub-Saharan Africa** | | | | | | | | | | | | | | | |
| Burkina Faso | 77-94 | -0.01 | 0.01 | -0.01 | 0.01 | 0.00 | 0.03 | 0.0315 | -0.02 | 0.03 | -0.01 | -0.07 | 0.03 | 0.03 | 0.0030 |
| Burundi | 85-93 | -0.01 | 0.00 | -0.01 | 0.05 | 0.02 | 0.04 | 0.0248 | -0.02 | 0.03 | -0.01 | -0.05 | 0.04 | 0.04 | 0.0006 |
| Cameroon | 75-93 | -0.02 | 0.00 | -0.01 | 0.16 | 0.11 | 0.08 | -0.0358 | -0.03 | 0.03 | -0.01 | 0.01 | 0.08 | 0.08 | -0.0056 |
| Cent Afr Rep | 80-94 | -0.01 | 0.00 | -0.01 | -0.01 | -0.03 | 0.04 | 0.0721 | -0.01 | 0.03 | -0.01 | -0.08 | 0.04 | 0.04 | 0.0041 |
| Cote d'Ivoire | 75-93 | -0.01 | 0.01 | -0.01 | 0.12 | 0.11 | 0.10 | -0.0074 | -0.01 | 0.03 | -0.01 | -0.01 | 0.10 | 0.10 | -0.0033 |
| Ethiopia | 85-94 | -0.01 | 0.00 | -0.01 | 0.06 | 0.04 | 0.02 | -0.0241 | -0.01 | 0.02 | -0.01 | -0.04 | 0.02 | 0.02 | 0.0001 |
| Gabon | 75-92 | -0.05 | 0.01 | -0.01 | 0.20 | 0.06 | 0.00 | -0.0632 | -0.06 | 0.03 | -0.01 | 0.03 | 0.01 | 0.00 | -0.0081 |
| Gambia | 76-93 | -0.01 | 0.00 | -0.01 | 0.13 | 0.09 | 0.09 | -0.0062 | -0.02 | 0.03 | -0.01 | -0.01 | 0.09 | 0.09 | -0.0037 |
| Ghana | 75-94 | -0.01 | 0.01 | -0.01 | -0.05 | -0.04 | 0.02 | 0.0625 | -0.01 | 0.03 | -0.01 | -0.10 | 0.01 | 0.02 | 0.0064 |
| Kenya | 75-93 | -0.02 | 0.01 | -0.01 | 0.09 | 0.05 | 0.05 | -0.0017 | -0.03 | 0.03 | -0.01 | -0.03 | 0.05 | 0.05 | -0.0015 |
| Madagascar | 76-94 | 0.00 | 0.01 | -0.01 | -0.01 | 0.00 | 0.07 | 0.0763 | -0.01 | 0.03 | -0.01 | -0.08 | 0.07 | 0.07 | 0.0042 |
| Malawi | 80-94 | -0.01 | 0.00 | -0.01 | 0.14 | 0.10 | 0.08 | -0.0248 | -0.02 | 0.02 | -0.01 | 0.00 | 0.08 | 0.08 | -0.0046 |
| Mali | 88-93 | -0.02 | 0.01 | -0.01 | 0.15 | 0.12 | 0.04 | -0.0798 | -0.03 | 0.03 | -0.01 | 0.01 | 0.09 | 0.04 | -0.0533 |
| Mauritania | 85-94 | -0.01 | 0.01 | -0.01 | 0.23 | 0.20 | 0.10 | -0.1015 | -0.02 | 0.02 | -0.01 | 0.05 | 0.11 | 0.10 | -0.0101 |
| Mauritius | 77-93 | -0.02 | 0.01 | -0.01 | 0.10 | 0.06 | 0.04 | -0.0200 | -0.03 | 0.03 | -0.01 | -0.02 | 0.05 | 0.04 | -0.0023 |
| Mozambique | 85-91 | -0.01 | 0.01 | -0.02 | 0.54 | 0.54 | 0.21 | -0.3274 | -0.03 | 0.02 | -0.01 | 0.21 | 0.24 | 0.21 | -0.0280 |
| Nigeria | 75-93 | -0.02 | 0.01 | -0.01 | 0.06 | 0.03 | 0.04 | 0.0045 | -0.03 | 0.03 | -0.01 | -0.04 | 0.04 | 0.04 | 0.0002 |
| Nigeria | 76-93 | -0.01 | 0.01 | -0.01 | -0.03 | -0.04 | 0.03 | 0.0708 | -0.02 | 0.03 | -0.01 | -0.09 | 0.02 | 0.03 | 0.0055 |
| Rwanda | 76-93 | -0.01 | 0.00 | -0.01 | 0.04 | -0.01 | 0.01 | 0.0255 | -0.02 | 0.02 | -0.01 | -0.06 | 0.01 | 0.01 | 0.0015 |
| Senegal | 75-93 | 0.00 | 0.01 | -0.01 | 0.03 | 0.04 | 0.07 | 0.0374 | -0.01 | 0.03 | -0.01 | -0.06 | 0.07 | 0.07 | 0.0017 |
| Sierra Leone | 76-93 | 0.00 | 0.01 | -0.01 | 0.09 | 0.11 | 0.11 | 0.0036 | 0.00 | 0.03 | -0.01 | -0.03 | 0.11 | 0.11 | -0.0017 |
| Sudan | 75-80 | 0.00 | 0.00 | -0.01 | 0.03 | 0.02 | 0.09 | 0.0629 | -0.02 | 0.02 | 0.00 | -0.06 | 0.02 | 0.09 | 0.0718 |
| Togo | 77-94 | -0.02 | 0.01 | -0.01 | 0.10 | 0.05 | 0.05 | 0.0008 | -0.03 | 0.03 | -0.01 | -0.02 | 0.05 | 0.05 | -0.0025 |
| Uganda | 84-94 | -0.01 | 0.01 | -0.01 | 0.01 | 0.00 | 0.02 | 0.0206 | -0.02 | 0.03 | -0.01 | -0.07 | 0.01 | 0.02 | 0.0032 |
| Zaire | 75-89 | -0.01 | 0.01 | -0.01 | -0.04 | -0.03 | 0.05 | 0.0801 | -0.01 | 0.03 | -0.01 | -0.10 | 0.04 | 0.05 | 0.0062 |
| Zambia | 85-94 | -0.01 | 0.01 | -0.01 | 0.11 | 0.11 | 0.07 | -0.0346 | -0.01 | 0.02 | -0.01 | -0.02 | 0.08 | 0.07 | -0.0030 |
| Zimbabwe | 80-93 | -0.02 | 0.01 | -0.01 | 0.09 | 0.06 | 0.04 | -0.0187 | -0.03 | 0.03 | -0.01 | -0.03 | 0.04 | 0.04 | -0.0014 |

1/ Authors' calculations based on Table 4.

Table 6. Current Account Imbalances in Africa, 1975-95

| Region | Using Eq. (1) in Table 4 | | | Using eq. [1a] in Table 4 | | |
|---|---|---|---|---|---|---|
| | Fitted | Actual | Imbalance 1/ | Fitted | Actual | Imbalance 1/ |
| Africa | 3.68 | 5.88 | 2.20 | 4.88 | 5.88 | 1.00 |
| North Africa | 8.41 | 6.03 | -2.38 | 6.41 | 6.03 | -0.38 |
| Sub-Saharan | 2.95 | 5.86 | 2.91 | 4.65 | 5.86 | 1.21 |

Source: Table 5.

1/ The imbalance is the difference between the actual and the fitted value of the current account deficit.

## Dynamic Panel Data Econometric Methodology[18]

Recently developed dynamic panel data techniques allow us to address potential endogeneity problems, as well as possible unobserved time and country-specific effects that may produce biased and inconsistent estimates.[19] This methodology formulates a set of moment conditions that can be estimated using GMM techniques in order to generate consistent and efficient estimates. Specifying the regression equation in differences allows elimination of the country-specific effect. First-differencing yields

$$y_{i,t} - y_{i,t-1} = \beta_1\left(y_{i,t-1} - y_{i,t-2}\right) + \beta_2\left(X_{i,t} - X_{i,t-1}\right) + \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right). \quad (1)$$

The use of instruments is required to deal with two issues: first, the likely endogeneity of the explanatory variables, $X$, which is reflected in the correlation between these variables and the error term; and, second, the correlation of the new error term, $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$, by construction with the differenced lagged dependent variable, $(y_{i,t-1} - y_{i,t-2})$. Instead of assuming strict exogeneity (that is, the explanatory variables be uncorrelated with the error term at all leads and lags), we allow for the possibility of simultaneity and reverse causation. We adopt the more flexible assumption of weak exogeneity, according to which current explanatory variables may be affected by past and current realizations of the dependent variable but not by its future innovations. Under the assumptions that (a) the error term, $\varepsilon$, is not serially correlated, and (b) the explanatory variables are weakly exogenous, the following moment conditions apply:

$$E\left[y_{i,t-s} \cdot \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \quad (2)$$

$$E\left[X_{i,t-s} \cdot \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \quad (3)$$

The GMM estimator simply based on the moment conditions in (2) and (3) is known as the differences estimator. Although asymptotically consistent, this estimator has low asymptotic precision and large biases in small samples, which leads to the need to complement it with the regression equation in levels.[20] For the regression in levels, the

---

[18] This section draws heavily from Calderón, Chong and Loayza (1999). Also, we would like to thank Norman Loayza who generously contributed to this section.

[19] For instance, Holtz-Eakin, Neway, and Rosen, (1988), Arellano and Bond (1991), Kiviet (1995), Alonso-Borrego and Arellano (1999), Arellano and Bover (1995), Blundell and Bond (1997), and Ziliak (1997).

[20] Alonso-Borrego and Arellano (1999) and Blundell and Bond (1997) show that when the lagged dependent and the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences. This weakness has repercussions for both the asymptotic and small-sample performance of the differences estimator. As persistence increases, the asymptotic variance of the coefficients

(continued...)

country-specific effect is not directly eliminated but must be controlled for by the use of instrumental variables. The appropriate instruments for the regression in levels are the lagged differences of the corresponding variables if the following assumption holds; although there may be correlation between the levels of the right-hand side variables and the country-specific effect, there is no correlation between the differences of these variables and the country-specific effect. This assumption results from the following stationarity property,

$$E\left[y_{i,t+p} \cdot \eta_i\right] = E\left[y_{i,t+q} \cdot \eta_i\right] \quad and \quad E\left[X_{i,t+p} \cdot \eta_i\right] = E\left[X_{i,t+q} \cdot \eta_i\right] \quad for\ all\ p\ and\ q \tag{4}$$

Therefore, the additional moment conditions for the second part of the system (the regression in levels) are given by the following equations:[21]

$$E\left[\left(y_{i,t-s} - y_{i,t-s-1}\right) \cdot \left(\eta_i + \varepsilon_{i,t}\right)\right] = 0 \quad for\ s = 1 \tag{5}$$

$$E\left[\left(X_{i,t-s} - X_{i,t-s-1}\right) \cdot \left(\eta_i + \varepsilon_{i,t}\right)\right] = 0 \quad for\ s = 1 \tag{6}$$

Using the moment conditions presented in equations (2), (3), (5) and (6), and following Arellano and Bond (1991) and Arellano and Bover (1995), we employ a generalized method of moments (GMM) procedure to generate consistent estimates of the parameters of interest. The weighting matrix for GMM estimation can be any symmetric, positive-definite matrix, and we obtain the most efficient GMM estimator if we use the weighting matrix corresponding to the variance-covariance of the moment conditions. Since this variance-covariance is unknown, Arellano and Bond (1991) and Arellano and Bover (1995) suggest the following two-step procedure. First, assume that the residuals, $\varepsilon_{i,t}$, are independent and homoskedastic both across countries and over time. This assumption corresponds to a specific weighting matrix that is used to produce first-step coefficient estimates. We construct a consistent estimate of the variance-covariance matrix of the moment conditions with the residuals obtained in the first step, and we use this matrix to reestimate our parameters of interest (i.e. second-step estimates). Asymptotically, the second-step estimates are superior to the first-step ones in so far as efficiency is concerned. The moment conditions are applied such that each of them corresponds to all available periods, as opposed to each moment condition corresponding to a particular time period. In the former

---

obtained with the differences estimator rises (i.e., deteriorating its asymptotic precision). Furthermore, Monte Carlo experiments show that the weakness of the instruments produces biased coefficients in small samples. This is exacerbated with the variables' over-time persistence, the importance of the specific effect, and the smallness of the time-series dimension.

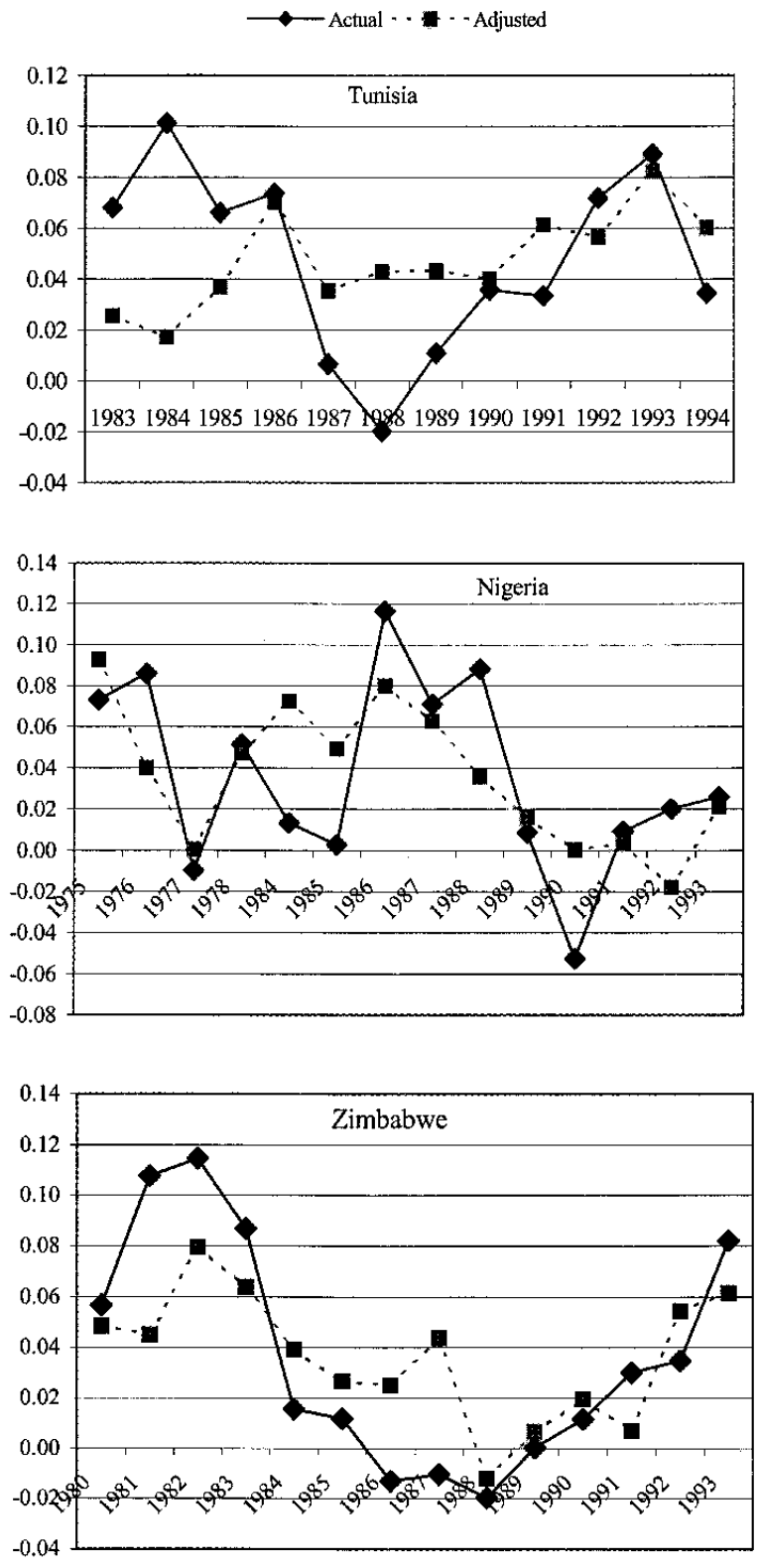
[21] Given that lagged levels are used as instruments in the differences specification, only the most recent difference is used as instrument in the levels specification. Other lagged differences would result in redundant moment conditions. (Arellano and Bover,1995).

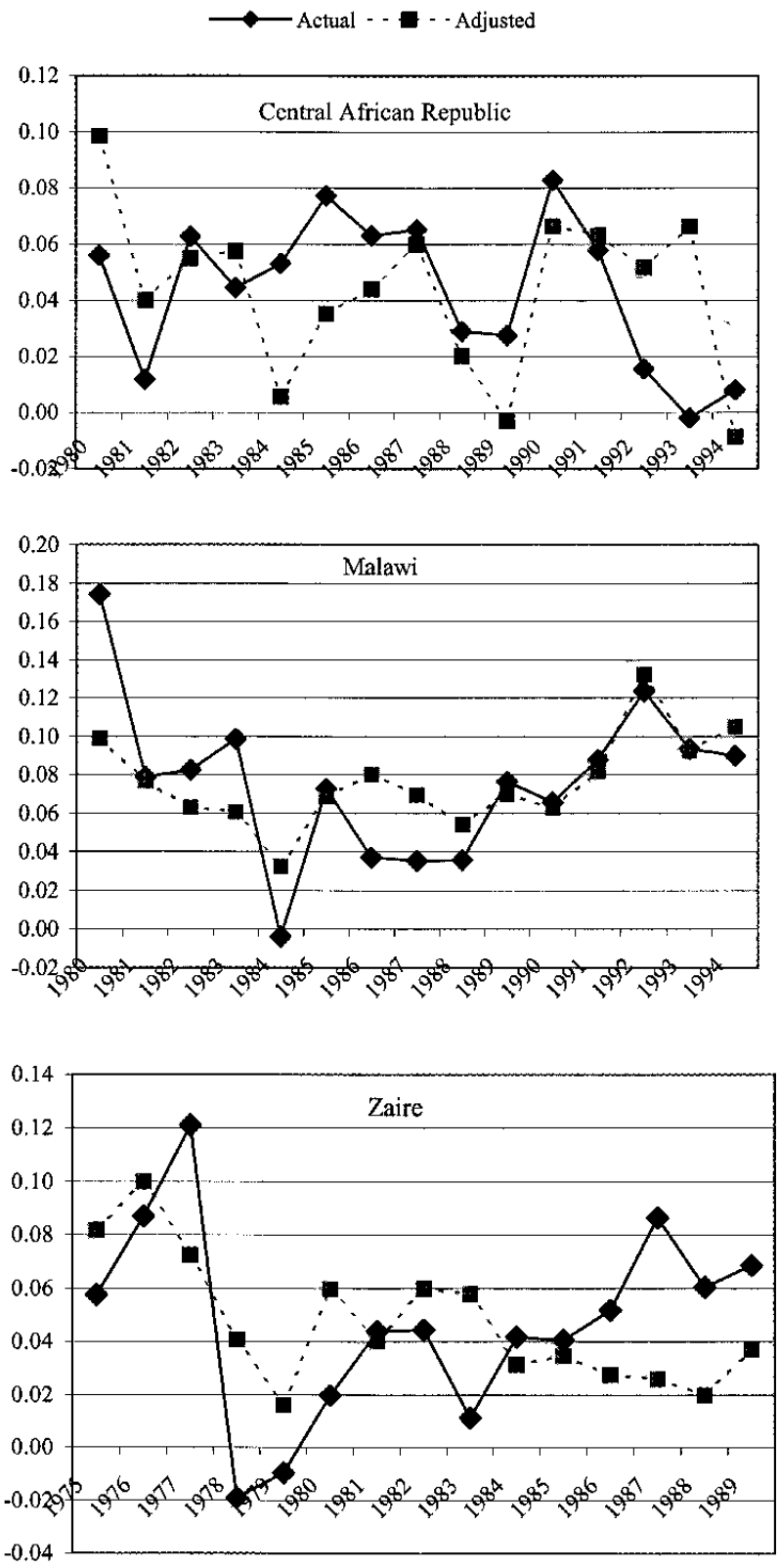
case, the number of moment conditions is independent of the number of time periods, whereas in the latter case, it increases more than proportionally with the number of time periods. Most of the literature dealing with GMM estimators applied to dynamic models of panel data treats the moment conditions as applying to a particular time period. This approach is advocated on the grounds that it allows for a more flexible variance-covariance structure of the moment conditions. Such flexibility is achieved without placing a serious limitation on the degrees of freedom required for estimation of the variance-covariance matrix because the panels commonly used in the literature have both a large number of cross-sectional units and a small number of time-series periods (typically not more than five). We have, however, chosen to work with the more restricted application of the moment conditions (each of them corresponding to all available time periods) because of a special characteristic of our panel, namely, its large time-series dimension (for some countries in our sample, we work with as many as 20 time-series observations). This approach allows us to work with a manageable number of moment conditions, so that the second-step estimates, which rely on estimation of the variance-covariance matrix of the moment conditions, do not suffer from overfitting biases.

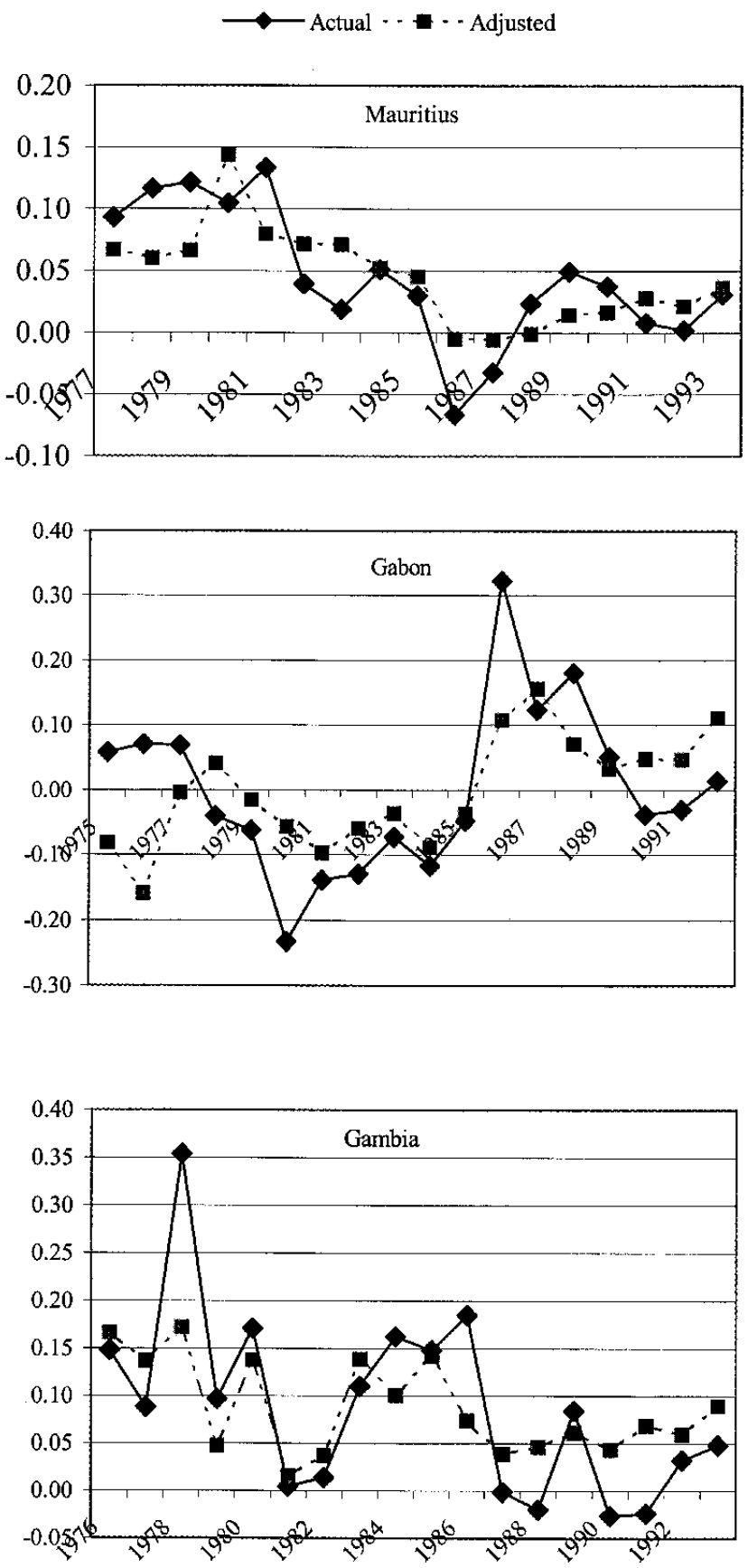
**Countries in the Sample**

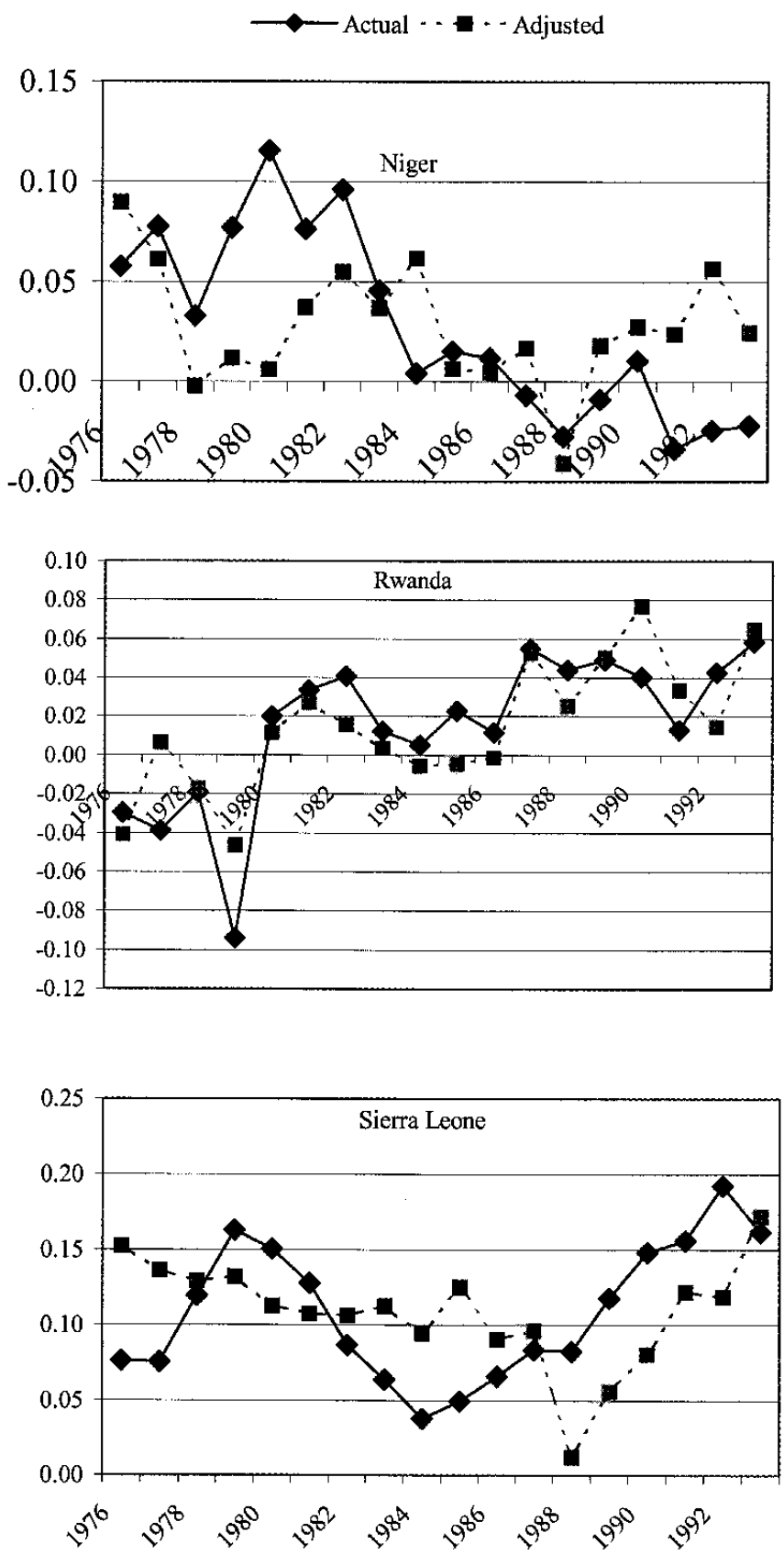
| Code | Country | Code | Country |
|---|---|---|---|
| ARG | Argentina | MEX | Mexico |
| BDI | Burundi | MLI | Mali |
| BFA | Burkina Faso | MLT | Malta |
| BGD | Bangladesh | MOZ | Mozambique |
| BLZ | Belize | MRT | Mauritania |
| BOL | Bolivia | MUS | Mauritius |
| BRA | Brazil | MWI | Malawi |
| CAF | Central African Rep. | MYS | Malaysia |
| CHL | Chile | NER | Niger |
| CHN | China | NGA | Nigeria |
| CIV | Côte d'Ivoire | NPL | Nepal |
| CMR | Cameroon | PAK | Pakistan |
| COL | Colombia | PAN | Panama |
| CRI | Costa Rica | PER | Peru |
| DOM | Dominican Rep. | PHL | Philippines |
| ECU | Ecuador | PNG | Papua New Guinea |
| EGY | Egypt | PRY | Paraguay |
| ETH | Ethiopia | RWA | Rwanda |
| GHA | Ghana | SDN | Sudan |
| GTM | Guatemala | SEN | Senegal |
| HND | Honduras | SLE | Sierra Leone |
| HTI | Haiti | SLV | El Salvador |
| IDN | Indonesia | SYR | Syrian Arab Rep. |
| IND | India | TGO | Togo |
| IRN | Iran, Islamic Rep. of | THA | Thailand |
| JAM | Jamaica | TTO | Trinidad and Tobago |
| JOR | Jordan | TUN | Tunisia |
| KEN | Kenya | TUR | Turkey |
| KOR | Korea, South | UGA | Uganda |
| LKA | Sri Lanka | URY | Uruguay |
| MAR | Morocco | ZAR | Zaire |
| MDG | Madagascar | ZWE | Zimbabwe |

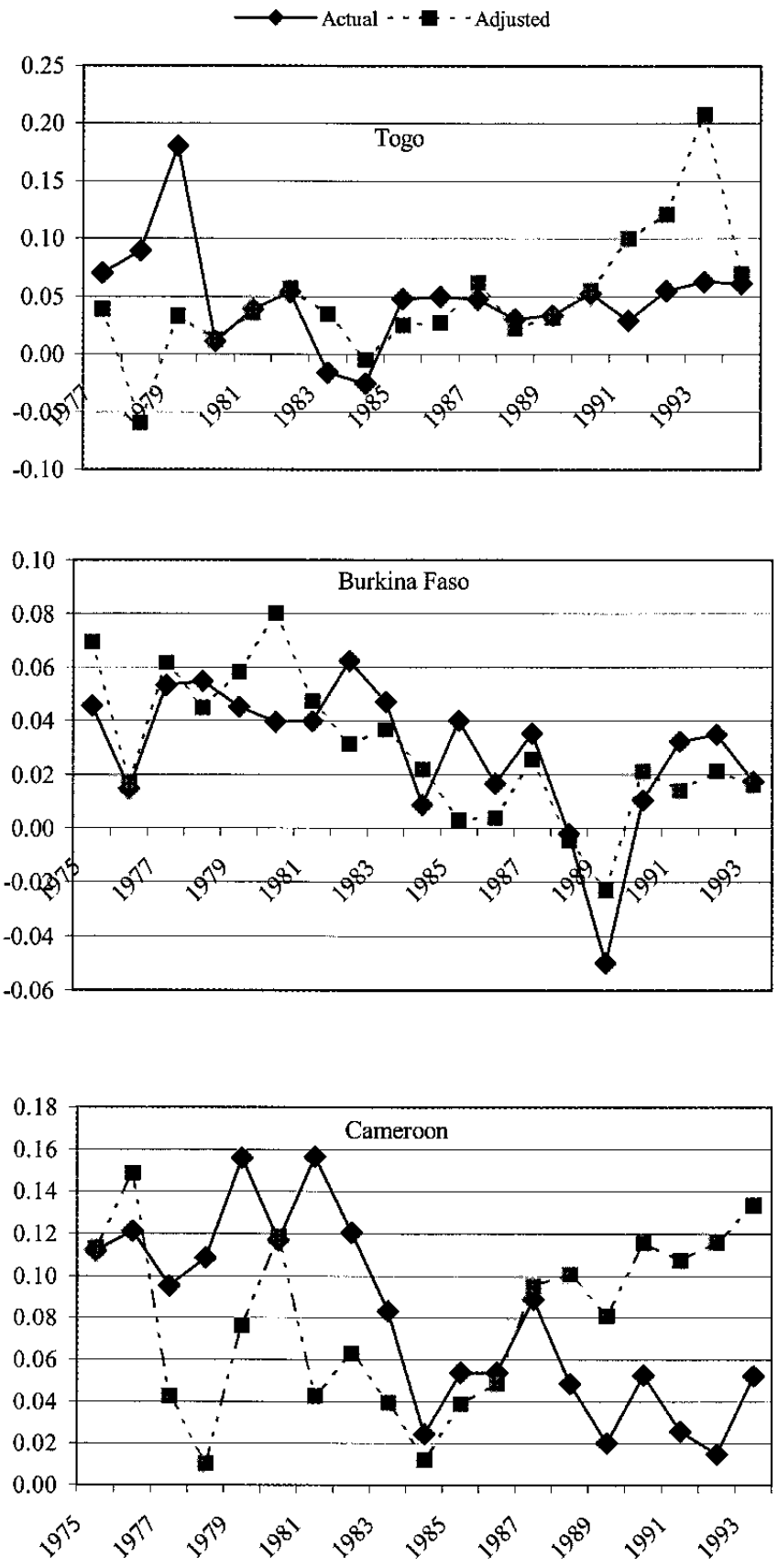
**Current Account Balances in Selected African countries**
**(in share of GDP)**

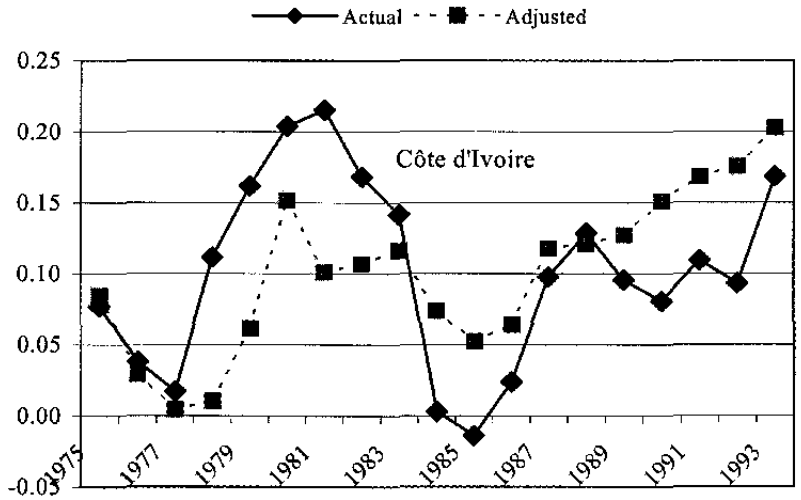


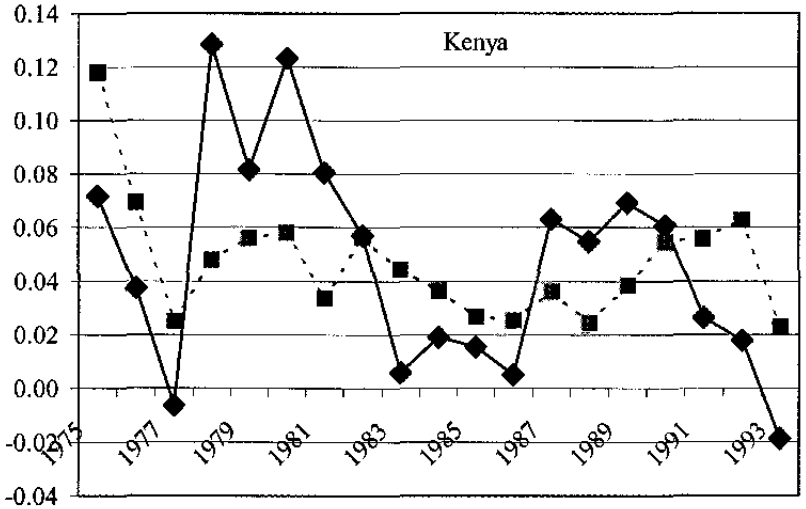

Actual
Adjusted
Central African Republic
Malawi
Zaire

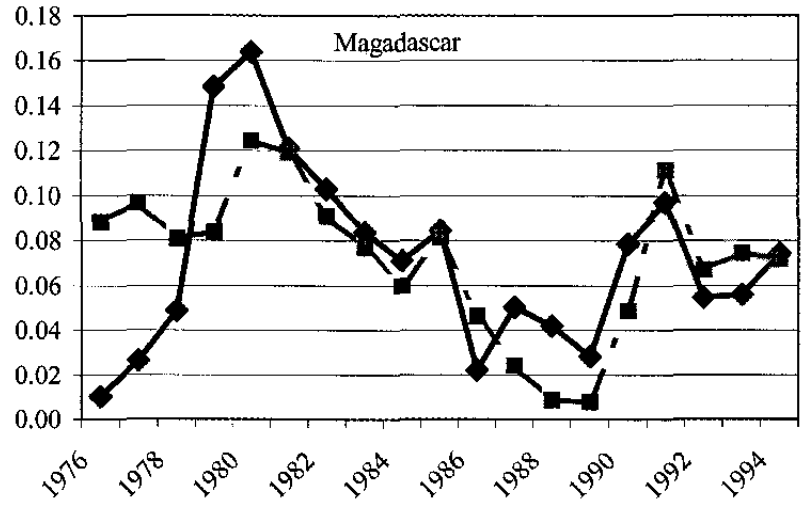

Actual
Adjusted
Mauritius
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
1977
1979
1981
1983
1985
1987
1989
1991
1993
Gabon
0.40
0.30
0.20
0.10
0.00
-0.10
-0.20
-0.30
1975
1977
1979
1981
1983
1985
1987
1989
1991
Gambia
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
1976
1978
1980
1982
1984
1986
1988
1990
1992

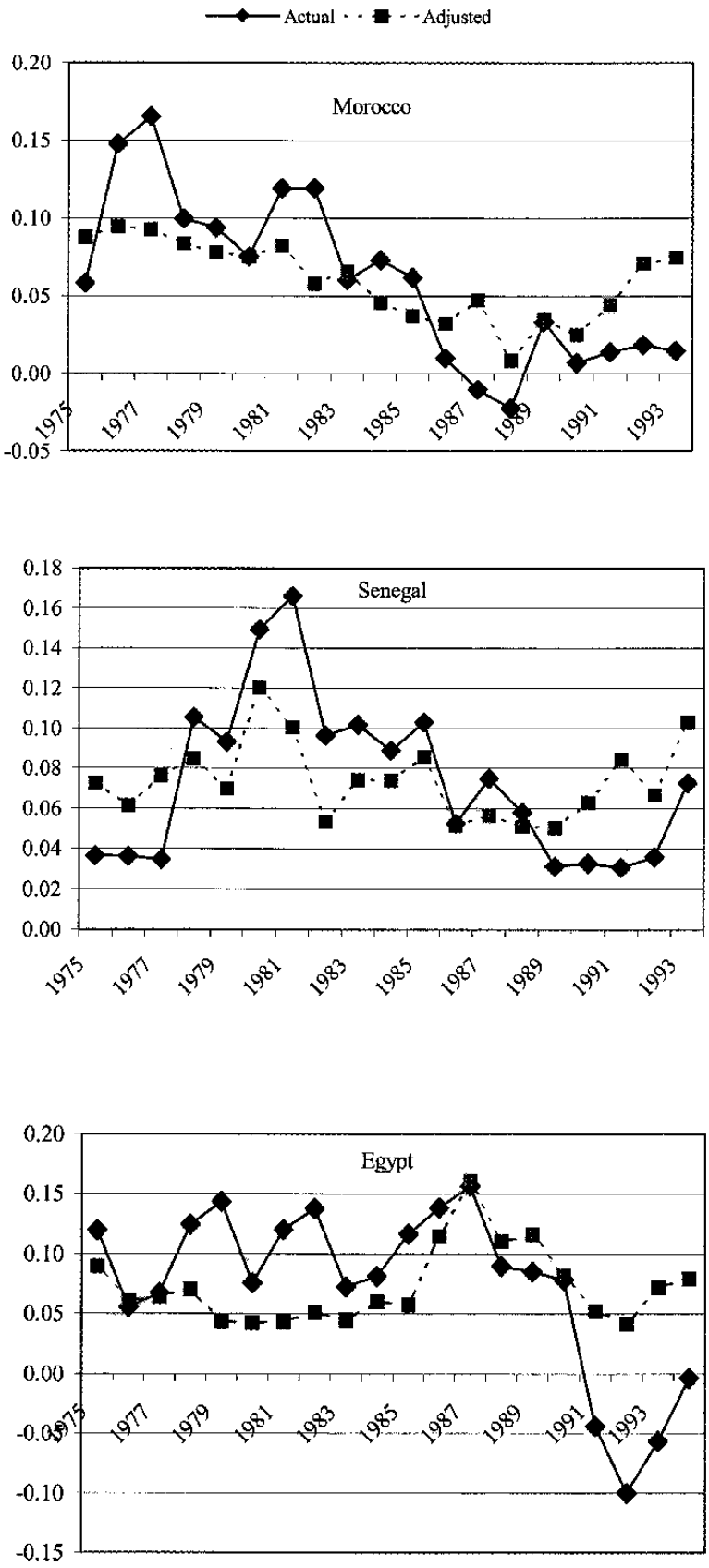

Actual
Adjusted
Niger
0.15
0.10
0.05
0.00
-0.05
1976
1978
1980
1982
1984
1986
1988
1990
1992
Rwanda
0.10
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
-0.06
-0.08
-0.10
-0.12
Sierra Leone
0.25
0.20
0.15
0.10
0.05
0.00

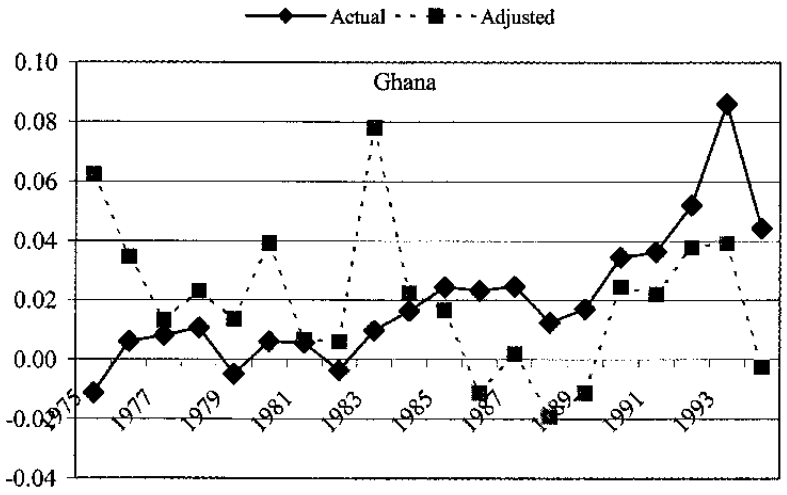

Actual
Adjusted
Togo
Burkina Faso
Cameroon
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
0.10
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
-0.06
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993

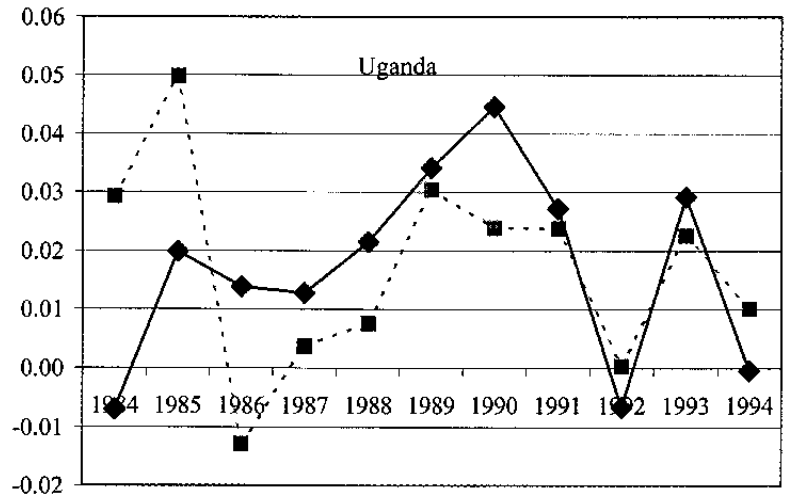

Actual
Adjusted
Côte d'Ivoire
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993

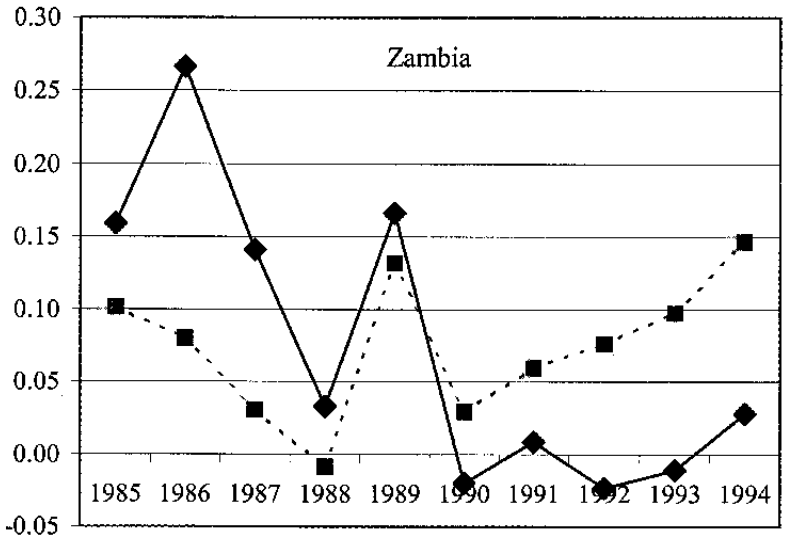

Kenya
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993

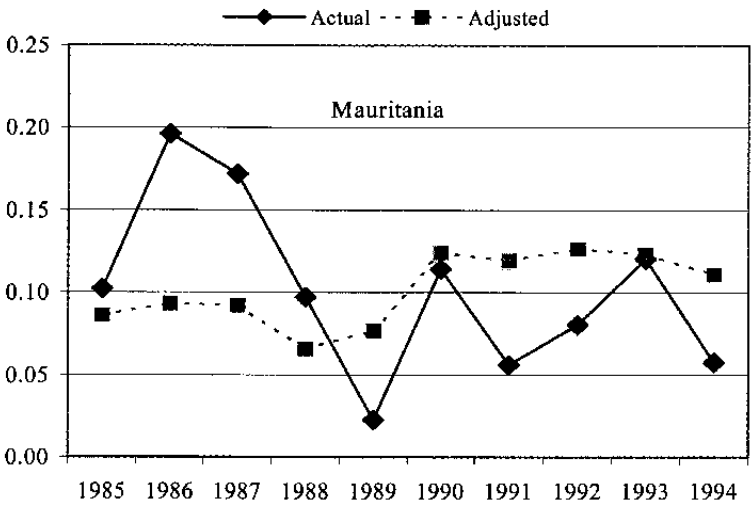

Magadascar
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994

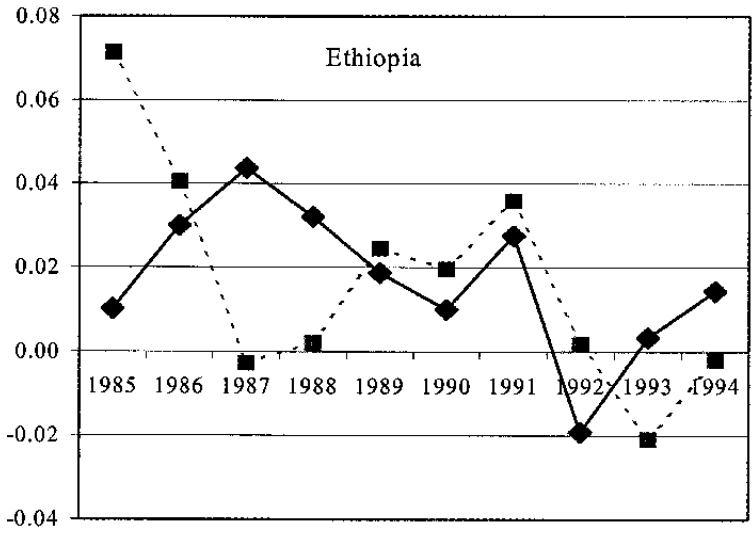

Actual
Adjusted
Morocco
0.20
0.15
0.10
0.05
0.00
-0.05
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
Senegal
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Egypt
-0.10
-0.15

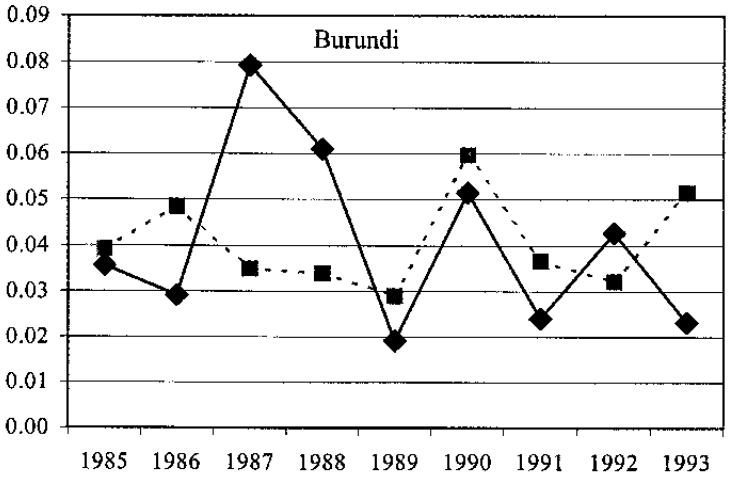

Actual
Adjusted
Ghana
0.10
0.08
0.06
0.04
0.02
0.00
-0.04
1977
1979
1981
1983
1985
1987
1989
1991
1993

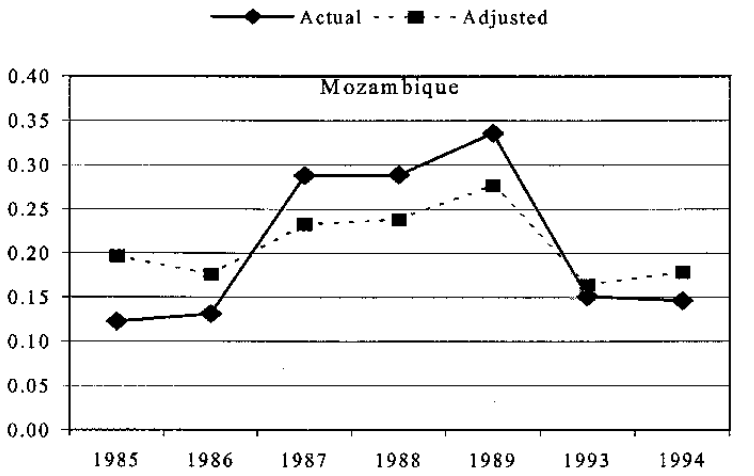

Uganda
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
-0.02
1985
1986
1987
1988
1989
1990
1991
1993
1994

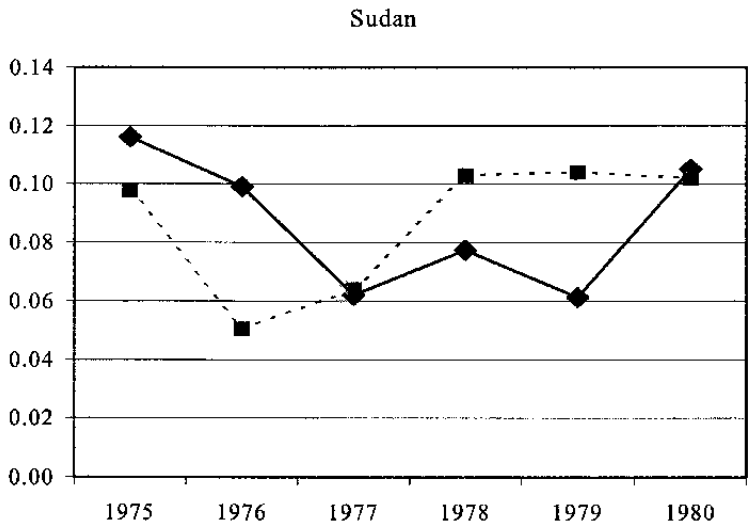

Zambia
0.30
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
1985
1986
1987
1988
1989
1991
1993
1994

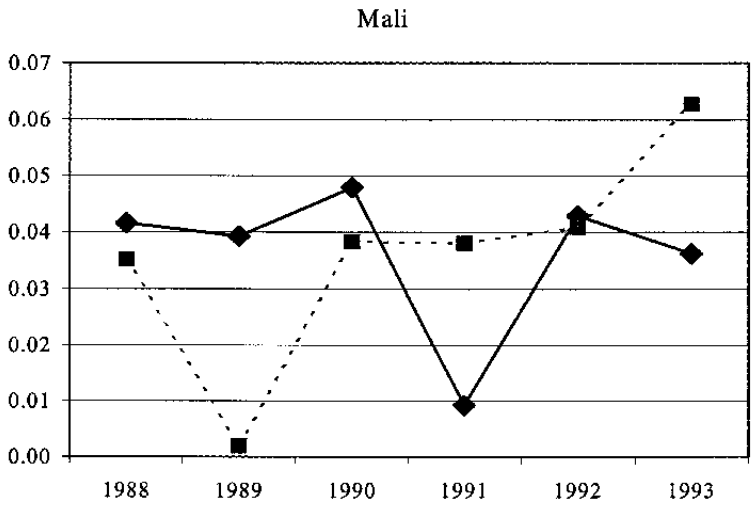

Actual
Adjusted
Mauritania
0.25
0.20
0.15
0.10
0.05
0.00
1985 1986 1987 1988 1989 1990 1991 1992 1993 1994


Ethiopia
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
1985 1986 1987 1988 1989 1990 1991 1992 1993 1994


Burundi
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1985 1986 1987 1988 1989 1990 1991 1992 1993


Actual
Adjusted
Mozambique
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1985
1986
1987
1988
1989
1993
1994


Sudan
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1975
1976
1977
1978
1979
1980


Mali
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1988
1989
1990
1991
1992
1993