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World Bank-Supported Adjustment Programs

Country Performance and Effectiveness

Vittorio Corbo
and
Patricio Rojas

Most of the Bank's adjustment lending programs have increased the growth rate of GDP, the ratio of exports to GDP, and the ratios of saving to GDP. But the average ratio of investment to GDP is lower than 1970s levels. Sometimes unsustainable levels of public investment in the 1970s had led to economic crisis, and investment had to become more efficient. To restore growth, the challenge of the 1990s is to have good economic policies and to create the conditions needed to increase investment-to-GDP ratios.

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This paper — a product of the Macroeconomic Adjustment and Growth Division, Country Economics Department — is part of a larger effort in PRE to assess the effectiveness of adjustment lending. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Aludia Oropesa, room N11-035, extension 39075 (37 pages).

Simple comparisons of growth rates in countries that have had at least two structural adjustment loans (SALs) or at least three adjustment loans (the first one in 1985 or before), show that their growth has improved more than that of other countries.

But simple comparisons of the performance of groups of countries are poor estimators of the effectiveness of adjustment programs because the performance of an adjusting country is the result of:

- The policies that would have been in place even without adjustment loans from the Bank.
- World economic conditions.
- The effects of the Bank-supported program.
- Internal shocks to the economy (such as drought, wars, and earthquakes).

After explicitly controlling for external shocks and nonprogram determinants of performance, Corbo and Rojas find that adjustment lending programs have usually increased the growth rate of GDP and the ratio of exports to GDP, and have increased the saving-to-GDP ratio over early 1980s levels. But the average ratio of investment to GDP has fallen below 1970s levels.

The drop in investment's share in GDP in the initial years of adjustment must be interpreted carefully. In many countries, economic crisis was the result of unsustainable levels of public investment reached in the 1970s; part of the needed adjustment was reducing high levels of inefficient public investment. Also, the initial uncertainty that occurs when an adjustment program begins will probably slow down private investment.

Despite their disappointing investment performance, these countries experienced more of an increase in their rates of GDP growth in 1985-88 than in 1970-80. This must reflect more efficient investment combined with increased capacity utilization.

But for countries that have reduced most of their policy inefficiencies, achieving an acceptable, sustainable growth rate in the 1990s will require higher investment rates than those achieved in the 1980s. The challenge of the 1990s is to create the conditions needed to generate an increase in investment-to-GDP ratios.

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by
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Patricio Rojas

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1. Introduction

The purpose of a structural adjustment program is to restore sustainable economic growth and make lasting progress in alleviating poverty. The process is lengthy, however, often with requirements to control inflation, achieve a sustainable external balance, change incentives, create or strengthen institutions, mobilize saving and increase investment. Control of inflation and reduction of the external deficit are usually attempted at the beginning of the program, to lay the foundation for credible macroeconomic and institutional reform. When enough progress has been achieved with the inflation and the current account, structural reform to improve resource allocation and lift other impediments to growth are initiated. Thus, an examination of performance indicators one or two years after the initiation of an adjustment effort reveals little about the effectiveness of an adjustment program. Rather, it will likely pick up the short-term adjustment costs instead of the medium- and long-term adjustment benefits. Case studies of countries where enough time has passed since the initiation of the adjustment effort may permit a more complete evaluation of adjustment programs. At the same time, even those studies need to look beyond the characteristics of the program to consider as well as initial conditions in the country (e.g., GDP growth and the ratios of investment, saving and exports to GDP in the period before the program), and internal (e.g., the policy environment) and external factors (e.g., the terms of trade, international real interest rates and access to external financing), and to take them into account in assessing effectiveness.

Evaluating performance in adjusting countries requires measuring the marginal contribution of adjustment programs while controlling for other factors that affect performance. Thus, the contribution of an adjustment lending program is calculated as the difference between actual performance and an estimated counterfactual scenario of what would have happened in the absence of the

program, given initial conditions in the country, the external environment facing it and policies in the period before the program was initiated. We approach the construction of a counterfactual scenario by using three alternative statistical approaches: the standard before-after comparison, the standard control group comparison and the modified control group comparison, in which we assess the effects of adjustment lending using not only techniques to control for conditions that influence the effectiveness of adjustment measures but also for country characteristics that help determine the decision to participate in an adjustment program. In sum, the initiation of an adjustment program with World Bank support is seen as an endogenous decision that is based on the benefits the country expects from the program.[1]

We use these three approaches to assess if countries that undertake a program with the World Bank have performed better than they would have in the absence of the adjustment program. Performance and the effectiveness of adjustment lending are evaluated using four indicators: rate of growth of GDP, ratio of saving to GDP, ratio of investment to GDP, and ratio of exports to GDP. We compare the value of the performance indicators in 1985-88--a period after adjustment was initiated--with performance in two base periods, 1970-80 and 1981-84, for three groups of countries: intensive adjustment lending (EIAL), countries that have received two or more structural adjustment loans (SALs) or three or more adjustments loans (SALs or sectoral adjustment loans, SECALs), starting in 1985 or before; other adjustment lending (OAL)--countries that started a program after 1985 or have received fewer than two SALs or fewer than three adjustment loans in 1985 or before; and no adjustment lending (NAL),[2] countries that have received no adjustment loans.

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[1] Econometric or CGE-type models are usually used in individual country studies of program effectiveness. See, for example, Corbo and de Melo (1989), Condon, Corbo and de Melo (1990), and Bourguignon, Morrisson and Suwa (1990).

[2] Table A.1 in the Appendix A lists the countries in each group.

2. Initial Conditions, External Shocks, Policy Stance and a First Look at Performance

Initial conditions and external shocks are important determinants of performance as well as of the demand for adjustment lending. Similarly, the domestic policies before and during adjustment are also important. In fact, countries receiving adjustment lending are supposed to follow policies aimed at reducing the current account deficit to a level compatible with normally available financing while minimizing losses in output and employment and creating the conditions for sustainable growth. Fiscal, monetary and exchange rate policies are the key macroeconomic ones used for adjustment (most of the time as part of an IMF program), while the most common types of Bank-supported structural reforms involve institutional and incentive measures in the public sector, trade policy and the financial system.

When other factors are controlled for, the importance of initial conditions in the performance of a country when it undertakes a program is evident. A country with better initial conditions (e.g., higher saving, investment, and export to GDP ratios, a lower debt to GDP ratio, a lower fiscal deficit to GDP, less inflation, and so on) has a better chance of improving its performance under a given adjustment program than does a country with worse initial conditions.

Table 1 shows, in the 1970-80 period base the EIAL countries had relatively high saving and investment ratios. In contrast, they had the highest debt to GDP ratios and the highest rates of inflation. In the case of the ratios of debt to exports and exports to GDP, rate of growth of GDP and fiscal deficit to GDP, the EIAL countries fell between the OAL and NAL countries. The OAL countries had the highest debt to export ratios, and the lowest saving and export to GDP ratio and rate of growth of GDP. In contrast, the NAL countries had the most favorable ranking for eight of the nine indicators. In the 1981-84 period, in general the indicators of initial conditions showed a similar ranking as before, except for rate of growth of GDP, which was lowest in the EIAL countries (see Tables 2 and 3). However, in absolute terms the indicators for debt, inflation and GDP growth were worse for the three groups, especially the EIAL countries. Thereafter, based on the review of initial conditions in each group of countries, it appears that on average the NAL countries did not need adjustment, while the

EIAL countries did quite well in the 1970s except in the case of debt indicators. However, in the 1981-84 period, the demand for adjustment lending by the EIAL countries seems to have been a mixture of debt problems and the worst indicators in terms of inflation and GDP growth.

Even if initial conditions had been the same in the various country groups, the differences in the intensity with which they experienced the external shocks could have affected the economic performance of countries that were implementing adjustment programs. The developing countries in the 1980s faced an external environment that combined a world recession, the highest real interest rates since the Great Depression, declining and often volatile terms of trade for many countries, and, in the case of many middle-income countries, a sudden cut-off from international financial markets. Table 4 presents the effect of the terms of trade and interest rate shocks only. A comparison of 1981-84 with 1970-80 shows how large the external shocks in the early 1980s were: both EIAL and NAL countries suffered an average annual loss of close to 12% of GDP in 1980, the OAL countries about 5%. In contrast, when comparing the period 1985-88 with the period 1981-84, the EIAL countries were the only group that experienced a positive external shock. However, this positive shock followed a much larger deterioration in the early 1980s.

External financing from non-official sources to the EIAL and OAL countries dropped substantially after the 1981-82 period, just when they were being hit by large terms of trade and interest rate shocks. If the negative external shocks of the early 1980s had been judged as temporary, the EIAL and OAL--principally middle-income countries--could have pursued the standard option of using foreign reserves and foreign borrowing to avoid adjustment. This response would have been proper. However, with the exception of IMF and World Bank borrowing--which was conditional on the adoption of an adjustment program--foreign borrowing was difficult to obtain after August 1982. Moreover, once it became clear the adverse external environment would continue for some time, countries had to adjust. For countries that were ready to initiate adjustment programs, the access to financing from international financial institutions allowed them to make progress toward achieving internal and external balance by

gradually implementing structural adjustment policies, assisted by foreign commercial borrowing.[3] Table 5 shows that EIAL countries suffered severe reductions in non-official flows of external financing after 1982, while the NAL countries continued to receive an important amount in terms of GDP. That fact helps explain why the NAL countries did not use adjustment lending even when the total external shock they faced in 1981-84 was also major.

Country Performance

To compare the performance of the EIAL, OAL and NAL countries, we analyze four indicators of progress in macroeconomic adjustment--real GDP growth, domestic saving over GDP, investment over GDP, and exports over GDP--in three periods, 1970-80 (first), 1981-84 (second) and 1985-88 (third). Although judgment of the effectiveness of an adjustment program cannot be based on a simple comparison of observed performance, nevertheless the before-after approach is useful in underlining what happened in the country groups.[4]

Table 2 shows that for the EIAL countries the rate of GDP growth dropped substantially from 1970-80 to 1981-84 but then recovered in 1985-88. In the OAL and NAL countries, the rate of growth dropped on average between the first and second periods and then stayed almost constant between the second and third. A drastic reduction in the rate of growth of GDP between the first and second periods was common to all the country groups but was greatest for the EIAL.[5]

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[3] The World Bank introduced adjustment lending in 1980 to facilitate this adjustment. The main rationale was that a substantial adjustment could be made easier and its cost reduced, by spreading it over time. In particular, to expand exports requires time to build export capacity and develop markets. (See Corbo and Fischer 1990.)

[4] As we explain in Section 3, the before-after comparison is a very poor measure of program effects. However, it does provide measures of actual changes in given indicators.

[5] Table A.2, which presents the performance of each EIAL country in the three periods, shows that only 13 of the 25 EIAL countries had a higher average growth rate in the third period than in the first period. This table also shows a wide variation in performance, indicating that a variety of factors seem to have been determining performance. While, a comparison of the rates of growth of GDP for the second and third periods tell us that 22 out of 25 EIAL countries improved performance. Often, the improvement in the external environment accounted for part of this improvement, but the effect of the programs could have been just as important.

The investment to GDP ratio in the EIAL and OAL countries decreased on average continuously from the first to the third periods. For the NAL countries, the ratio rose between the first and second periods and fell between the second and third periods.[6]

Domestic saving as a share of GDP dropped by 3.9 percentage points between the first and second periods and then recovered 2.4 percentage points between the second and third periods in the EIAL countries. In contrast, in the NAL countries, although the drop between the first and second periods was similar, the recovery was only 0.4% of GDP.[7]

The export to GDP ratio of the EIAL countries improved continuously from the first to the third periods, increasing by almost 4 percentage points on average.[8] To assess the effect of extreme observations we also used indicators of rank (first quartile, median and third quartile). There is no evidence of extreme observations distorting the information provided by the central tendency measures, except in the case of the export to GDP ratio.

Policy Stance

To see how the policy stance changed in the EIAL countries, we examine four indicators--the real exchange rate, the inflation rate, and the fiscal and resource balance deficits as shares of GDP (Table 3). Although a government cannot directly control the real effective exchange rate or inflation rate, fiscal, monetary and exchange rate policies affect their evolution. For countries that had to reduce their current account deficits, a substantial real devaluation was an important component of successful adjustment. For many

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[6] When comparing 1985-88 with 1970-80, the investment share in GDP decreased or stayed constant in every country but Korea, Costa Rica and Mauritius. Between 1981-84 and 1985-88, the ratio of investment to GDP increased in only 7 of the 25 EIAL countries.

[7] As shown in Table A.2, between the first and third periods the saving rates in 10 out of 25 EIAL countries rose. When comparing periods two and three, the domestic saving rates increased in 16 of the 25 EIAL countries.

[8] In 15 out of 25 EIAL countries, the export to GDP ratio improved between the first and third periods. Between 1985-88 and 1981-84, the export to GDP ratio increased in 17 of the 25 EIAL countries.

countries after 1982, it was available financing rather than policies that determined the evolution of their resource balance. Therefore, the resource balance in the post 1982 period is more a constraint than a policy variable.

The comparison of 1981-82 with 1970-80 shows that the EIAL countries experienced an increase in the fiscal deficit as a share of GDP, appreciation of their currencies, an increase in their average inflation rates, and an increase in their average resource balance deficits. After 1981-82, in general the EIAL countries improved their fiscal situation and achieved a continuous real depreciation. Nevertheless, average inflation rose constantly, the result of the greater monetization of their (smaller) fiscal deficits. The middle-income EIAL countries with large external public debts adjusted their budgets in response to the sharp drop in their capacity to borrow abroad, but at the same time their interest payments on existing external debt were increasing, and government revenues were suffering from the worsened terms of trade. The resource balance deficit as a share of GDP fell in the EIAL countries by more than half on average between 1981-82 and 1983-84.

To deal with the fiscal crisis starting in 1981-82, the typical EIAL country cut its public expenditures (usually by drastically reducing investment), increased its revenue and relied more on domestic financing of the budget deficit (via domestic interest-bearing debt or credit from the central bank). Bail-outs of firms hit hard by the large devaluations and the recession complicated the fiscal situation further. Fiscal adjustment was usually a prerequisite for improving internal macroeconomic stability and was usually at the heart of the structural adjustment program. For the EIAL countries, the resource balance deficit as a share of GDP declined continuously after 1981-82.

The OAL countries also showed a mild deterioration in all four policy indicators between 1970-80 and 1981-82. Then, there was an increase in the rate of inflation between 1981-82 and 1983-84 without much change in the real exchange rate and the fiscal situation. They nevertheless made progress between 1983-84 and 1985-88 in achieving real devaluations, and in reducing their resource balance deficits as shares of GDP.

On the other hand, economic policy before 1980 was better in the NAL countries than in other countries. After 1981-82, however, their real exchange rates appreciated substantially and their policy indicators and real growth of GDP worsened (Table 2).

3. Statistical Analysis of Country Performance

The Before-After Approach

This approach consists of comparing a given indicator of performance after a specific program was put in place with performance prior to t program. The before-after estimator is simply the mean change in the target variable over some relevant period. With Δy the change in the target variable between the program period and the previous period, the simple before-after estimator (β) involves calculating the mean change across the group of program countries for each of the macroeconomic outcome variables that we want to analyzes:

$$\Delta y_i = \beta \qquad \text{for all } i \in P \qquad (1)$$

where P denotes the set of program countries. Thus, any change in a target variable in a program country (or in a group of program countries) is attributed exclusively to the program. The significance of this estimator, β, is usually tested through the standard t-test, and in some cases using non-parametric statistical tests.

Although the before-after approach has been the most popular in the literature on the effects of programs, the results are likely to be biased and inconsistent. The main problem with this approach is that it embodies the implicit assumption of "other things being equal," which is highly implausible. Specifically, it is difficult to determine whether observed changes in, say, the GDP growth rate can be ascribed to a Bank supported-program or to other non-program factors that have not been held fixed in the analysis. This point is crucial because in our period of analysis, these non-program determinants, especially terms of trade and international interest rates, have changed widely

from year to year and country to country. If we define the effectiveness of a program as the difference between the actual macroeconomic performance observed under a program and the performance that would have been expected in the absence of the program,[9] the before-after approach is a poor estimator of this counterfactual scenario, because the situation prevailing before the program is not likely to be a good predictor of what would have happened in the absence of a program, given that non-program determinants are changing from year to year.

[9] This definition was used in Goldstein and Montiel (1986) and Khan (1988).

Control-Group Approach

The control-group approach is designed to overcome, in part, the inability of the before-after approach to distinguish between program and non program determinants of macroeconomic outcomes. This procedure basically uses the behavior of a control group (a group of non-program countries) to estimate what would have happened in the program group in the absence of programs. It implicitly assumes that the only difference between the program and non-program groups is that countries in the former group of countries are undertaking a program. The control-group approach still assumes, however, that program and non-program countries are subject to the same non-program determinants, i.e., they face the same external environment and the effect on performance of these other determinants is the same for both groups of countries. This approach also ignores the effects of pre-program characteristics on performance.

The control-group estimator is calculated by running the following regression for the sample of program and non-program countries:

$$\Delta y_i = \beta_o + \beta_1 d_i \qquad \text{for all } i \in Q \tag{2}$$

where Q denotes the set of program and nonprogram countries and d_i is a dummy variable with a value of one for program countries. The estimated value of β_1 is equal to the difference in the mean changes in the target variables for program and non-program countries. Thus, a statistically significant value for β_1 would thus indicate that the change in the target variable for the program country was different from the corresponding change in that variable for non-program countries (the control group).

This approach controls for the effect of changes in the global economic environment, but it assumes that such global factors affect program and non-program countries equally. This assumption introduces a bias, however, whenever program countries differ systematically from non-program countries. This point is important for performance evaluation.

If the determinants of program selection are positively correlated with the non-program determinants of change in the macroeconomic target variables that

would have occurred in the absence of a program, the control-group estimate of the program effects will overstate the actual program ones. In short, if the program countries are more likely to have experienced negative temporary shocks in the pre-program period, a comparison of the changes in mean macroeconomic outcomes between program and non-program countries will most likely overstate the true independent effect of the program. A negative shock in the pre-program period simultaneously increases the probability of participation in the program and the probability of a positive change in the target variable, y_i, in the program period. Thus, attributing all the improvement in y_i to a program overstates its real effect. This kind of bias, known in the literature as sample-selectivity bias, will be zero if the determinants of program selection are uncorrelated with the determinants of macroeconomic performance or when the program group has been randomly selected. Only in these case will the control-group approach estimator be an unbiased indicator of the program effect.

A Modified Control-Group Estimator

There are several estimators that resolve the sample-selectivity bias. One of them is obtained from the modified control-group approach.[10] The basic idea is to accept the non-random selection of program countries, to identify the differences between program and non-program countries in the pre-program period and then to control for these differences in the comparison with subsequent economic performance. Furthermore, the modified control group approach also control for world economic conditions and the stance of country policies without program.

The modified control-group approach starts from the basic equation for the macroeconomic target variable in country i in level form (equation [3]) instead of using the first difference form that applied in the before-after and control-group approaches. Thus, in period 3 we have the following equation:

$$y_i = x_i'\omega + W_i'\alpha + \beta_4 d_i + e_i \qquad (3)$$

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[10] Goldstein and Montiel (1986) outline a procedure for removing the sample-selectivity bias from control-group estimates of the effects of the program when the selection of program countries is non-random.

where x_i is a K-element vector of macroeconomic policy instruments that would have been observed in the absence of a program in country i; W_i is an M-element random vector of world non-program variables relevant to country i; and d_i is a dummy variable that takes the value of unity if a country has a program and the value of zero otherwise.[11] Equation (3) says that the level of the targeted results will be a function of four factors: (i) the value of selected policy instruments that would have occurred in the absence of a program, x; (ii) the change in selected world economic conditions, W; (iii) the total effects of a Bank-supported program if the country has a program in place, d; and (iv) a range of unobservable shocks that are specific to country i, e_i.

The complete policy vector x can be generated by estimating equation 4, the policy reaction function:[12]

$$\Delta x_i = [y_i^d - (y_i)_{-1}]\gamma + u_i \qquad (4)$$

where y_i^d is the desired value of the vector y_i and u_i is the unobservable error term. This equation says that policymakers display a systematic policy reaction to perceived disequilibria in their macroeconomic target variables. More specifically, it says that the change in country i's macroeconomic policy instruments between the current and previous period will be a function of the difference between the desired value of the macroeconomic target variables in this period and their actual value in the preceding period. γ is the vector of the coefficients that indicates the responsiveness of the policy instruments to such target disequilibria.

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[11] To avoid a potential specification error we also included in our estimation a predetermined dummy that takes a value of one for countries with an IMF program in 1985 or before. Of our sample of 25 intensive adjustment countries, 23 undertook a program with the IMF before that they undertook a program with the World Bank. Of other two, only one, Nigeria, undertook a program with the IMF after 1985--during 1987--while Colombia has not undertaken a program with the IMF in 1985 or since.

[12] As x represents the counterfactual scenario--the policies that would have been undertaken in the absence of the program--it is directly observable only for non-program countries and must be estimated for program countries.

In practice, as Goldstein and Montiel (1986) mention, an important limitation of the modified control-group estimator is that such a reaction function may be highly unstable both across countries and in a given country over time so that, in the extreme case of instability, the problem of estimating the counterfactual scenario becomes insoluble.

The model is completed with equations (5) to (7):

$$z_i = [\, y_i^d - (y_i)_{-1}]\delta + \pi_i \tag{5}$$

$$d_i = 1 \text{ if } z_i > z^* \tag{6}$$

$$d_i = 0 \text{ if } z_i \leq z^* \tag{7}$$

where z_i is a random variable that serves as the index of country-specific characteristics that determines the probability of country i having a program during a given period; z^* is the threshold value of the z that divides program from non-program countries and π_i is an unobservable error term.

The first step in estimating x_i for the program countries is to fit the reaction function to observable data for the non-program countries. The only unobserved variable in equation (4) is the country-specific vector of desired macroeconomic outcomes, y_i^d. As Goldstein and Montiel (1986) maintain, if this variable can be assumed to be constant over time, it can be captured by a set of country-specific constants (γ_{oi}) so that equation (4) is now

$$\Delta x_i = \gamma_{oi} - \gamma(y_i)_{-1} + u_i \quad . \tag{8}$$

If both the setting of the policy instruments in equation (8) and the acceptance by a country of a program as specified in equation (5) reflect policy decisions of the government, any unobservable factors, π_i, that make a given country more likely to resort to official assistance, such as a specific program, may also lead it to adopt a different policy package in the absence of the program, in contrast to another country facing similar observable circumstances.

Thus, if the model presents a correlation between the error terms π_i in equation (5) and u_i in equation (4), the behavior of the non-program countries would not be a good guide to the counterfactual scenario in the program countries. If such a correlation is present,[13] then equation (8) will provide a biased estimate of Δx_i for the program countries, unless we assume something with respect to the errors π_i and u_i. The method of estimation that we use in this paper does not require any extra assumption with respect to the relationship between the error terms of equations (4) and (5) (more on this point below).[14]

By subtracting $(y_i)_{-1}$ from both sides of equation (3) and substituting x_i by equation (8), our model for estimating the effects of a specific program is:[15]

$$\Delta y_i = \beta_o + \beta_1(y_i)_{-1} + \beta_2(x_i)_{-1} + \beta_3 W_i + \beta_4 d_i + e_i \ . \qquad (9)$$

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[13] In their estimations of the model, Goldstein and Montiel (1986), assume that both error terms are uncorrelated.

[14] See Heckman (1979).

[15] Equation (9) is the reduced form used by Goldstein and Montiel (1986) to estimate the effects of the IMF program.

However, the dummy variable included on the right side of the equation that measures the effect of the program in country i is endogenous. The choice of countries to undertake a specific program principally depends on their expectation of better performance with respect to the target macroeconomic variables, y_i. Thus, we would expect that the coefficient of the effect of the program should be biased and inconsistent in the model used by Goldstein and Montiel (1986). This kind of bias can also be called self-selectivity, because the data are generated by the self-selection of the countries.

To resolve this selectivity bias, Barnow, Cain and Goldberger (1981) discuss several consistent estimators for in this situation. The method used here essentially treats d_i as an endogenous variable and uses instrumental variables to correct for the bias.[16] The first stage consists of estimating a status equation that determines whether or not the country should undertake a program. We estimate the following equation using the probit ML method

$$P(d_i = 1) = \Phi[\delta_o + (y_i)_{-1}\delta + (x_i)_{-1}\omega + W'\phi + R'\psi] = \Phi[V_i\theta] \qquad (10)$$

where $\Phi[\ ]$ denotes the standard normal cumulative distribution, W is an M-element random vector of world non-program variables and R is an N-element vector of individual country characteristics, such as if the country is low-income, has a recurrent program with the IMF, has had an important internal shock, and so on. In the second stage we use the value of the probability of that the country will undertake a program with the World Bank, calculated with equation (10), as an instrument for d_i in the estimation of equation (9). The probability of the country undertaking a specific program, calculated by the probit model, is

$$\hat{d}_i = \Phi[V_i\hat{\theta}]. \qquad (11)$$

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[16] See also Heckman (1978).

Thus, using an instrumental variables technique in the estimation of equation (9), with $\hat{d}_i$ as an instrument of d_i,[17] allows us to obtain a consistent estimate of β_4, the coefficient of the effectiveness of the program.[18]

4. Overview of the Data

All the data used in our analysis are taken from the World Bank's ANDREX data base except the real exchange rate, which comes from IMF calculations. We consider a sample that contains observations from 77 developing countries during the 1970-88 sample period. They are ones for which data are available for all relevant macroeconomic variables for the period 1970-88. We work with the data in current and constant prices. Because most EIAL countries carried out a real depreciation in 1985-88, the relative price of investment goods and exports rose relative to the early 1980s. Therefore, to measure the contribution of growth in the supply response of exports, it is better to work with the investment to GDP and export to GDP ratios in constant prices. For completeness and to satisfy the adding up condition we also work with saving ratios at constant prices. For purposes of this analysis, the countries were grouped into two categories: EIALs, the program countries and a "control" group--the non-program countries--consisting of OALs and NALs. The OAL's are considered non-program countries because they have received too few adjustment loans during the period analysed.

The sample period was, as noted, divided into three periods: 1970-80 (first), 1981-84 (second) and 1985-88 (third), with the latter corresponding to the adjustment period. We compare performance in this third period in the program countries with respect some counterfactual scenario of what would have

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[17] This solution to the selectivity-bias problem of an instrumental variable method means that we do not have to assume that the error terms of equations (4) and (5) are uncorrelated.

[18] The instrumental variable method used here is more efficient than the two-stage least squares method suggested by Barnow, Cain and Goldberger (1981), principally because the robustness of the two-stage method depends on the well specification of the status equation and on the distribution assumption made in the estimation of equation (10) more than the instrumental variable procedure does. In addition, with the instrumental variable estimation, we do not need to correct the standard errors obtained from equation (9), while the standard errors obtained from a two-stage least squares estimation must be corrected. Because d_i has been estimated, the standard errors underestimate the true standard errors.

happened in the absence of an adjustment program. We use four indicators: rate of GDP growth and the ratios of gross domestic saving, gross investment and total exports to GDP. For each of these indicators we calculate simple averages in each period. Thus, for each country j, we have observations for variable i in periods one, two and three. (A complete list of the variables used in the analysis is presented in Appendix A.)

5. The Empirical Results

In both the control-group and modified control-group approaches we compare the performance of our four indicators in 1985-88 with performance in 1970-80 and 1981-84 for the program and non-program groups of countries.[19]

Table 5.1A and 5.1B report the results of the control-group estimates. Under this criterion for program evaluation and working in current prices, we find that the coefficients of the program effects are statistically significant for the rate of GDP growth and exports to GDP ratio: they show an improvement in the program period (1985-88) in relation to the periods (one and two). In contrast, the other two indicators do not show significant improvement with respect to any of the previous periods (Table 5.1A). When working at constant prices, only the change in the average rate of growth is positive and statistically significant. The investment to GDP ratio shows a substantial decrease with respect to the period 1970-80. In contrast, the changes in the saving to GDP and export to GDP ratios are not significant. Thus, if we were to use only the results from the control-group approach to evaluate the adjustment lending program, we would conclude that it led to improvements in the rate of GDP growth and the current price ratio of exports to GDP. In the case of the constant price ratios, the investment ratio decreased with respect to the period 1970-80, while the change in the other ratios was not statistically significant. As we mentioned in Section 3, the control-group estimates are an inconsistent estimator of the program's effects unless the determinants of

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[19] The relevant period of comparison would be the period before the program was put in place, but as some programs were initiated in the early 1980s, the 1970-80 is a better base period. In any case, we report results for both base periods.

program selection are uncorrelated with the determinants of macroeconomic performance or the program group is selected randomly. There are good a priori reasons for believing that the assignment of countries to the program and non-program groups is not random.

The inconsistency of the control-group estimates is overcome here by using the modified control-group estimates presented in Section 3. Table 5.2 presents the maximum likelihood probit estimates of the coefficients of the participation status function, equation (10). If a country decided to participate in an adjustment program in the period 1981-84, then we assume that the only important variables in that decision were the value of the external shock during the period 1981-84 (period two) with respect to 1970-80 (period one), SHOCK1; the change in the ratio of the current account surplus to GDP between periods one and two, CACC6; the change in non-official external financing over GDP between periods one and two, NETF6; the change in the ratio of total debt to GDP between periods one and two, DEBT6; the level of investment in period 2, INV2; the level of the real exchange rate in period 2, RER2; and a group of dummy variables--if the country had a program with the IMF, D1, if it is an African country, D2, if it is a Latin American country, D3, if it is a middle-income country, D6, and if it has a rate of inflation of over 60% per year in period 2, DINFLAC.[20]

All the coefficients of the participation equation (10) have the expected signs except the coefficient of change in the ratio of non-official external financing to GDP between periods one and two, NETF6. We expected that a positive change in this variable decreases the probability that a country would undertake an adjustment program with the World Bank. However, the coefficient is not significant. The rest of the coefficients are significant except for dummy variables D2 and D6. Table 5.2 also presents the pseudo-R^2, defined by McFadden (1974) as a measure of the goodness of fit of the ML probit estimation.

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[20] The dummy variable DINFLAC is defined with a value of one if a country has a rate of inflation of over 60% per year in period two. Countries with high levels of inflation are expected to be less likely to undertake a program, because before receiving a loan from the World Bank, they need to make enough progress in reducing their internal disequilibrium.

Consistent estimates of the coefficients of the target equation (9) are obtained using instrumental variables, with $\hat{d}_i$ as an instrument for d_i. Since we are working with grouped data, we calculate the robust White standard errors that are consistent under the possibility of heterokedasticity. The results are presented in Tables 5.3A and 5.3B.[21]

After explicitly controlling for the size of the external shock, the initial conditions and the policies followed in the pre-program period by each country, we find that the adjustment programs have had a positive and significant effect on the rate of growth of GDP.[22] This finding is verified when comparing performance in 1985-88 with 1970-80 and 1981-84. The change in the annual average rate of GDP growth in the EIAL countries was 1.6 percentage points higher than that the in all the other countries when measuring changes with respect to 1970-80. When measuring differences with respect to 1981-84, the adjustment programs are estimated to have boosted the rate of GDP growth by about 2 percentage points. In other words, adjustment does seem to have caused an increase in GDP growth relative to the early 1980s.

Note, however, that this average result for the EIAL countries involves an aggregation of successful and unsuccessful adjustment programs. Typically, the successful adjustment programs improved the rate of growth as a result of higher export growth, which more than offset the effects of the contractionary policies. In other countries, resources did not shift rapidly enough from non-tradable to tradable activities to increase growth, probably because of market distortions and institutional weaknesses.[23]

The estimations of equation (9) for the ratio of domestic saving to GDP find a positive and significant coefficient of program effects when comparing

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[21] For the modified control-group approach we report the results for the ratios in constant prices only.

[22] In the results (shown in Tables 5.3A and 5.3B) we are only interested in identifying the effect of Bank programs. Some of the coefficients for the other variables on the right-hand side are most of the time not statistically significant, in part because of high collinearity.

[23] Because in many of the countries in our sample IMF programs were also in place, we used a dummy for the presence of the IMF program. However, the dummy was never significant, and the results for the effectiveness of Bank-supported programs were practically identical to the ones without the dummy.

with the period 1981-84 but an insignificant effect when contrary with the period 1970-80. When comparing 1985-88 with 1981-84, the increase was 3.7 percentage points of GDP more for the EIAL than for the other countries.

In the case of the investment to GDP ratio, the adjustment programs appear to have led to a statistically significant drop of 3.5 percentage points of GDP between 1970-80 and 1985-88, whereas the effect between 1981-84 and 1985-88 was small and not significant. The impact of the programs on investment should, however, be interpreted carefully. Since adjustment is not estimated to have reduced growth, it must have increased the average efficiency of investment and utilization of capital. For countries where an integral component of their adjustment programs was to curtail low-efficiency public (and private) investment programs, a decrease in the investment rate was part of adjustment. The result is nonetheless worrisome, since in most countries the achievement of sustainable higher growth paths is likely to require an increase in physical capital (and human capital) investment above the average levels of the eighties.

Finally, when controlling for other factors, the coefficients of the program effects indicate that the programs also had a positive and significant effect on the export to GDP ratio, equal to about 6.5 percentage points of GDP between 1970-80 and 1985-88 and 2.5 percentage points of GDP between 1981-84 and 1985-88.

From this analysis we conclude that the adjustment lending programs in the EIAL countries have contributed to higher GDP growth and higher export to GDP ratios, and the saving to GDP ratio has improved with respect to the values reached in the early 1980s. However, the investment to GDP ratio has decreased on average for program countries over the level reached in the seventies.[24]

6. Conclusions

Simple comparisons of the growth rates in the countries that have had at least two SALs or at least three adjustment loans, with the first one in 1985 or before, show that their growth has improved relative to that of the other countries. However, simple comparisons of the performance of groups of countries are poor estimators of the effectiveness of adjustment programs. The reason is that the performance of an adjusting country results from (i) the policies that would have been in place in the absence of adjustment lending from the Bank, (ii) world economic conditions, (iii) the effects of the Bank-supported program and (iv) shocks to the economy (such as droughts and earthquakes). To isolate the net contribution of Bank-supported programs, it is necessary to "control" for non-program determinants of performance.

When the external shocks and conditions that determine the demand for adjustment programs are explicitly controlled for, the evidence shows that adjustment lending programs have usually increased the rate of growth of GDP and exports to GDP ratio and increased the saving to GDP ratio with respect to the level reached in the early 1980s, and have decreased the average ratio of investment to GDP over the level reached in the seventies.[25]

The drop in the share of investment in GDP in the initial years of adjustment has to be interpreted carefully. In many countries their economic

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[24] When working with ratios at current prices, the changes in GDP growth, saving/GDP and export/GDP are statistically significant with respect to both periods. In contrast, the change in investment/GDP was negative but not statistically significant with respect to both base periods.

[25] Conway (1990), using another statistical approach for a sample of 76 developing countries, also concludes that there is a significant association between participation in a World Bank adjustment lending program on the one hand and more rapid real economic growth, improved current account as a percentage of GNP and lower ratio of domestic investment to GNP on the other.

crisis resulted from a level of public investment reached in the 1970s that was unsustainable. Part of the needed adjustment was a reduction in the high levels of inefficient public investment. For private investment, the initial uncertainty that occurs when an adjustment program is started most likely will result in a slowdown of investment. Despite their disappointing investment performance, the EIAL countries experienced an increase in their rates of GDP growth in 1985-88 relative to 1981-84 and 1970-80. This result must reflect an increase in the efficiency of investment combined with an increase in capacity utilization. However, for countries that have reduced most of their policy inefficiencies, achieving a sustainable and acceptable rate of growth in the 1990s will require investment rates higher than those achieved in the early eighties. The challenge in the 1990s is to create the conditions needed to generate an increase in the investment to GDP ratios.[26]

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[26] The role of policies in generating a rise in investment is discussed in Serven and Solimano (1990).

TABLE 1

INITIAL CONDITIONS
(period average, 1970-80)

	1 DEBT AS % OF GDP[a/]	2 DEBT AS % OF Exports[a/b/]	3 REAL EFFECTIVE EXCH. RATE	4 FISCAL DEFICIT AS % OF GDP[c/]	5 ANNUAL AVG. RATE OF INFLATION	6 RATE OF GROWTH[d/]	7 DOMESTIC SAVING AS % OF GDP[d/]	8 INVESTMENT AS % OF GDP[d/]	9 EXPORTS AS % OF GDP[d/]
FIAL average	41.5 (3)	204.7 (2)	98.3 (3)	-6.4 (2)	23.2 (3)	4.6 (2)	18.7 (1)	24.3 (3)	24.7 (2)
Median	46.6	199.6	96.6	-6.9	13.5	5.6	19.2	23 8	22.3
1st quartile	24.2	116.3	94.4	-9.2	9.8	2.5	14.5	19.8	16.6
3rd quartile	49.3	277.0	101.7	-3.5	19.8	6.3	22.1	28.2	29 4
OAL average	39.6 (2)	206.2 (3)	97.9 (2)	-7.0 (3)	21.3 (2)	3.9 (3)	13.9 (3)	23.6 (2)	24.7 (3)
Median	34.9	150.1	99.1	-5.2	11.8	3.6	14.3	21.8	20.4
1st quartile	22.3	116.0	95.1	-7.1	8.9	2.7	2.9	15.7	12.0
3rd quartile	46.6	320.8	101.2	-2.1	16.9	4.9	24.0	30.8	34.4
NAL average	29.7 (1)	144.6 (1)	97.8 (1)	-4.4 (1)	12.2 (1)	5.5 (1)	14.6 (2)	22.6 (1)	29.9 (1)
Median	26.1	112.6	97.6	-3.5	11.4	4.6	15.4	21.6	29.1
1st quartile	16.9	76.8	94.2	-7.7	9.1	3.6	10.0	16.8	16.3
3rd quartile	37.0	128.8	100.5	-1.4	13.3	7.0	19.6	25.8	36.6

Source World Bank data.

a/ The ratios are computed using data in current US dollars; the period covered is 1975-80. The data include total disbursed guaranteed and non-guaranteed debt.

b/ Exports of goods and non-factor services are obtained from balance of payments statistics in the World Bank data files.

c/ This column considers only the average for the period 1976-80 and is based on IMF data; Algeria, Bolivia, Indonesia and Jamaica have data available only since 1979, Guinea-Bissau and Morocco since 1978, and Brazil, Burkina Faso, China, Congo, Greece, Niger and Portugal since 1977.

d/ The ratios are calculated with data in constant local currency.

Note: The numbers in parentheses are the rankings of the country groups for that indicator ("best" is one).

TABLE 2

COUNTRY PERFORMANCE

	Rate of Growth a/			Ratio of Domestic Saving to GDP			Ratio of Investment to GDP			Ratio of Exports to GDP		
	1970-80	1981-84	1985-88	1970-80	1981-84	1985-88	1970-80	1981-84	1985-88	1970-80	1981-84	1985-88
[illegible] average	4.6 (2)	1.3 (3)	4.2 (1)	18.7 (1)	14.8 (1)	17.2 (1)	24.3 (3)	19.9 (1)	18.6 (1)	24.7 (2)	25.1 (2)	28.1 (1)
Median	5.6	0.6	3.7	19.2	14.7	15.8	23.8	19.0	16.5	1.3	20.8	24.6
1st quartile	2.5	0.5	2.0	14.5	10.9	9.1	19.8	15.8	12.0	15.5	13.2	14.4
3rd quartile	6.1	2.7	6.0	22.1	19.0	19.1	28.2	21.0	20.4	29.4	30.1	31.0
[illegible] average	3.9 (1)	2.3 (2)	3.0 (2)	13.9 (3)	12.7 (2)	13.3 (3)	23.6 (2)	22.0 (2)	20.1 (1)	24.7 (3)	24.4 (3)	23.6 (3)
Median	3.6	1.9	3.1	14.3	12.0	12.2	21.8	19.2	18.1	20.4	19.4	17.9
1st quartile	2.7	0.6	0.5	2.9	1.2	1.8	15.7	14.7	12.2	12.0	9.0	9.6
3rd quartile	4.9	3.9	3.9	24.0	21.1	16.6	30.8	25.8	23.2	34.4	25.3	29.9
[illegible] average	5.5 (1)	3.1 (1)	2.7 (3)	14.6 (2)	14.0 (3)	14.4 (2)	22.6 (1)	24.1 (3)	20.0 (2)	29.9 (1)	26.1 (1)	24.6 (2)
Median	4.6	2.6	2.2	15.4	14.1	13.9	21.6	22.7	21.8	29.1	25.3	22.8
1st quartile	3.6	1.7	0.7	10.0	7.9	7.5	16.8	17.7	13.0	16.3	14.9	14.9
3rd quartile	7.0	5.7	3.9	19.6	20.0	19.2	25.8	27.3	23.2	36.6	32.1	43.8

Source: World Bank data.

a/ The ratios are calculated with data in constant local currency.
Note: The figures in parentheses indicate the rankings of the country groups for that indicator ("best" is one).

(T22P.WP)FQ
(PATOX90.WK1)
XI-1-90

TABLE 3

SELECTED INDICATORS OF POLICY STANCE

	Real Effective Exchange Rate a/				Ratio of Fiscal Deficit to GDP b/				Annual Average Rate of Inflation				Ratio of Resource Balance to GDP c/			
	1970-80	1981-82	1983-84	1985-88	1970 80	1981 82	1983 84	1985 88	1970 80	1981-82	1983-84	1985 88	1970 80	1981 82	1983 84	1985 88
ETAL																
Average	98 3 (3)	110 7 (3)	103 6 (2)	79 0 (1)	-6 4 (2)	-7 6 (3)	-6 2 (1)	-4 6 (3)	23 2 (3)	27 5 (3)	59 8 (3)	150 4 (3)	5 1 (1)	7 1 (1)	3 2 (1)	1 4 (1)
Median	96 6	105 7	98 2	78 9	-6 9	-7 6	-6 1	-3 8	13 5	14 3	17 9	13 4	5 0	6 1	1 9	0 7
1st quartile	94 4	97 6	88 6	69 7	-9 2	-10 5	-7 1	-5 9	9 8	11 5	6 5	4 8	2 1	3 9	0 2	2 6
3rd quartile	101 7	112 3	107 9	86 3	-3 5	-4 3	-3 3	-2 2	19 8	31 2	31 2	26 5	8 4	10 2	5 6	4 3
OAL																
Average	97 9 (2)	104 2 (1)	103 4 (1)	81 1 (2)	-7 0 (3)	-7 3 (2)	-7 6 (3)	-8 4 (3)	21 3 (2)	22 3 (2)	44 6 (2)	37 6 (1)	7 3 (3)	10 9 (2)	7 7 (2)	6 8 (3)
Median	99 1	104 0	96 9	80 8	-5 2	-5 8	-5 7	-5 7	11 8	14 3	11 1	10 1	5 5	9 5	5 0	2 1
1st quartile	95 1	96 3	89 3	64 5	-7 1	-8 0	-9 6	11 0	8 9	9 8	7 8	3 7	2 1	1 3	-0 7	0 0
3rd quartile	101 2	112 5	106 8	97 2	-2 1	-3 6	-3 3	-3 1	16 9	25 1	39 8	33 9	9 4	13 9	12 8	11 2
NAL																
Average	97 8 (1)	108 7 (2)	116 7 (3)	115 0 (3)	-4 4 (1)	-6 7 (1)	-7 0 (2)	-6 4 (2)	12 2 (1)	13 5 (1)	15 2 (1)	135 7 (2)	6 7 (2)	12 6 (3)	7 7 (2)	5 6 (2)
Median	97 6	107 4	113 0	101 1	-3 5	-6 2	-7 1	-6 4	11 4	10 4	9 2	9 0	3 6	7 5	6 1	5 5
1st quartile	94 2	102 1	98 0	87 4	-7 7	-10 4	9 8	-10 3	9 1	7 6	6 0	4 4	2 0	3 0	1 9	0 9
3rd quartile	100 5	115 7	128 8	122 8	-1 4	-2 4	-3 7	-3 0	13 3	13 8	15 9	20 1	8 4	17 2	10 4	8 9

Source World Bank data

a/ The real effective exchange rates are taken from the IMF data base The first column considers only the average of the 1978 80 period
A decrease in the index (1980=100) indicates a real depreciation

b/ IMF data The ratios are computed using data in current local currency
Algeria, Bolivia, Indonesia and Jamaica have data available only since 1979 Guinea-Bissau and Morocco have data available only since 1978
Brazil, Burkina Faso, China, Congo, Niger and Portugal have data available only since 1977 The 1976 and 1988 data for Greece are missing

c/ The ratios are calculated with data in constant local currency

Note The figures in parentheses indicate the rankings of the country groups for that indicator ("best" is one)

(T23P WP)FQ
(XE-1-90)FQ

TABLE 4A

EXTERNAL SHOCKS

	1981-84 Relative to 1970-80			1985-88 Relative to 1970-80			1985-88 Relative to 1981-84		
	Terms of Trade	Real Int. Rate	Total Shock	Terms of Trade	Real Int. Rate	Total Shock	Terms of Trade	Real Int. Rate	Total Shock
EIAL	-10.5	-1.9	-12.4	-6.0	-3.2	-9.2	1.1	-0.2	0.9
OAL	-2.9	-2.0	-4.9	-3.4	-3.6	-7.0	-0.4	-0.6	-1.0
NAL	-10.4	-1.2	-11.6	-13.9	-2.0	-15.9	-3.3	-0.3	-3.6

Source: World Bank data.

Note: The total effect of the external shocks as a % of GDP is computed as the sum of the real interest rate effect and the terms of trade effect. The interest rate effect is calculated as $-(r-r_{base})*(debt/GDP)_{beg}$, where r is the real interest rate computed as $(i-dp/p)/(1+dp/p)$; r_{base} is the average real interest rate of the base period (1975-80) or (1981-84); i is the ratio of interest payments to total debt; interest payments are calculated by adding public interest payments to private interest payments; private interest payments are proxied by multiplying private debt by L (L equals the three-month annualized LIBOR plus 1%); private debt is estimated by subtracting public and publicly guaranteed debt from total debt; dp/p is "world" inflation (proxied by the percentage change of the GNP deflator in the US, and $(debt/gdp)_{beg}$ is the ratio of debt to GDP in the year preceding the beginning of the end period. The debt data correspond to total disbursed guaranteed and non-guaranteed debt. The debt and interest rate information is available starting in 1975 only. Therefore, the average for the period 1970-1980 is estimated using information for the period 1975-80.
The effect of the terms of trade is computed as $[(PX/PX_{base})-1]*(X/GDP)_{beg}-((PM/PM_{base})-1)*(M/GDP)_{beg}$, where PX and PM are the average export and import price indices deflated by the US GNP deflator, respectively; PX_{base} and PM_{base} are the average price indices of the base period; X and M are exports and imports of goods and non-factoral services; and $(X/GDP)_{beg}$ and $(M/GDP)_{beg}$ are the ratios of X and M to GDP respectively in the year preceding the beginning of the end period. All the variables are denominated in current US dollars.

(ARATE1.WK1)FQ
(ASHOCKT1.WK1)FQ
(T23S.WP)FQ
X-30-90

TABLE 4B

TOTAL EXTERNAL SHOCKS

	1981-84 Relative to 1970-80	1985-88 Relative to 1970-80	1985-88 Relative to 1981-84
EIAL average	-12.4	-9.2	0.9
Median	-13.6	-10.1	0.7
1st quartile	-17.1	-13.3	-2.3
3rd quartile	-8.9	-3.3	3.4
CAL average	-4.9	-7.0	-1.0
Median	-6.3	-6.9	-1.5
1st quartile	-16.8	-13.1	-5.2
3rd quartile	-1.9	0.5	2.1
NAL average	-11.6	-15.9	-3.6
Median	-10.8	-11.2	-1.6
1st quartile	-20.6	-25.0	-7.1
3rd quartile	-2.1	-5.2	0.0

Source: World Bank data.

Note: The total effect of the external shocks as a % of GDP is computed as the sum of the real interest rate and terms of trade effects. The interest rate effect is calculated as $-(r-r_{base})*(debt/GDP)_{beg}$, where r is the real interest rate computed as $(i-dp/p)/(1+dp/p)$; r_{base} is the average real interest rate in base period (1975-80); (1981-84) i is the ratio of interest payments to total debt; interest payments are calculated by adding public and private interest payments; private interest payments are proxied by multiplying private debt by L (L equals three-month annualized LIBOR plus 1%); private debt is estimated by subtracting public and publicly guaranteed debt from total debt; dp/p is "world" inflation (proxied by the percentage change in the GNP deflator of the US, and $(debt/gdp)_{beg}$ is the ratio of debt to GDP in the year preceding the beginning of the end period. The debt data correspond to total disbursed guaranteed and non-guaranteed debt. Debt and interest rate information is available starting in 1975 only. Therefore, the average for the period 1970-80 is estimated using information for the period 1975-80.
The effect of the terms of trade is computed as $((PX/PX_{base})-1)*(X/GDP)_{beg}-((PM/PM_{base})-1)*(M/GDP)_{beg}$, where Px and PM are the average export and import price indices deflated by the US GNP deflator, respectively; PX_{base} and PM_{base} are the average price indices of the base period; X and M are exports and imports of GNFS; and $(X/GDP)_{beg}$ and $(M/GDP)_{beg}$ are the ratios of X and M to GDP respectively at the year preceding the beginning of the end period. All the variables are denominated in current US dollars.

TABLE 5

NON-OFFICIAL EXTERNAL FINANCING BEFORE AND DURING ADJUSTMENT
NET FLOW AS % OF GDP

	1975-80	1981-82	1983-84	1985-88
EIAL	1.8	3.3	0.4	0.0
OAL	3.0	1.1	0.6	0.5
NAL	1.1	3.1	2.2	-0.2

Source: World Bank data.

Note: The net capital flows correspond to the net long and short-term capital flows obtained from the balance of payments minus net flows (disbursements minus amortization) provided by official (bilateral and multilateral) creditors. All variables are denominated in current US dollars. Panama is not included in the data to avoid the distortion that the enormous capital flight causes in the aggregate.

TABLE 5.1 A

CONTROL-GROUP ESTIMATES OF THE PROGRAM EFFECTS[a]/
(ratios at current prices)

Periods Compared	Change in GDP Growth	Change in Investment/GDP	Change in Saving/GDP	Change in Exports/GDP
1985-88 with 1970-80	0.017 (2.402)	-0.015 (-1.108)	0.014 (0.839)	0.042 (2.023)
1985-88 with 1981-84	0.028 (3.141)	0.017 (1.498)	0.021 (1.438)	0.042 (3.070)

a/ As measured by the coefficient of the program dummy, β_1, of equation (2). The t-values are in parentheses.

TABLE 5.1 B

CONTROL-GROUP ESTIMATES OF THE PROGRAM EFFECTS[a]/
(ratios at constant prices)

Periods Compared	Change in GDP Growth	Change in Investment/GDP	Change in Saving/GDP	Change in Exports/GDP
1985-88 with 1970-80	0.017 (2.402)	-0.031 (-1.786)	-0.013 (-0.620)	0.038 (1.603)
1985-88 with 1981-84	0.028 (3.141)	0.017 (1.322)	0.025 (1.516)	0.018 (1.466)

a/ As measured by the coefficient of the program dummy, β_1, of equation (2). The t-values are in parentheses.

TABLE 5.2

MAXIMUM LIKELIHOOD PROBIT ESTIMATES OF THE STATUS PARTICIPATION EQUATION

Variable	Coefficient	Std. Error	t-Stat.	2-Tail Sig.
CONSTANT	-3.338	1.881	-1.775	0.081
CACC6	-15.269	6.685	-2.284	0.026
NETF6	7.731	5.183	1.491	0.141
RER2	0.020	0.012	1.667	0.101
SHOCK1	-3.156	1.583	-1.994	0.051
DEBT6	2.652	1.525	1.738	0.087
INV2	-8.692	4.574	-1.900	0.062
D1	2.045	0.715	2.858	0.006
D2	0.266	0.672	0.396	0.693
D3	-2.469	1.033	-2.389	0.020
D6	0.725	0.637	1.138	0.259
D7	3.540	1.008	3.511	0.001
DINFLAC	-1.465	0.658	-2.223	0.030

Note: Log likelihood = -24.99; pseudo R^2 = 0.50.
Number of observations: 77. The pseudo R^2 measure is equal to $[1-(\log L_n)/(\log L_c)]$, where L_n denotes the maximum of the likelihood function when maximized with respect to all the parameters, and L_c is the maximum when maximized with respect to the constant term only.

TABLE 5.3 A

MODIFIED CONTROL-GROUP ESTIMATES OF THE PROGRAM EFFECTS[a/]
(constant prices)
(1985-88 relative to 1970-80)

	C	GDP1	INV1	SAVDOM1	EXP1	RER1	FISC1	SHOCK2	d
Change in GDP growth	0.004	-0.613	0.032	-0.014	-0.034	-0.000	-0.052	-0.026	0.016
	(0.133)	(-5.164)	(0.693)	(-0.425)	(-1.198)	(-0.003)	(-0.742)	(-1.358)	(1.988)**
Change in investment/GDP	0.009	0.854	-0.561	-0.014	0.021	0.000	-0.086	0.037	-0.035
	(0.128)	(3.339)	(-5.509)	(-0.173)	(0.427)	(0.609)	(-0.764)	(0.724)	(-1.725)***
Change in saving/GDP	-0.094	1.336	-0.011	-0.345	0.004	0.000	0.079	-0.010	0.014
	(-0.972)	(3.975)	(-0.084)	(-3.281)	(0.065)	(0.707)	(0.513)	(-0.187)	(0.542)
Change in exports/GDP	-0.092	-0.412	0.634	-0.295	-0.179	0.001	0.621	-0.074	0.065
	(-0.700)	(-0.753)	(3.746)	(-1.816)	(-2.005)	(0.487)	(2.852)	(-0.833)	(2.023)**

Note: The t-values are in parentheses.
* Statistically significant at the 2.5% level.
** Statistically significant at the 5% level.
*** Statistically significant at the 7.5% level.
**** Statistically significant at the 10% level.
a/ Estimation of equation (9), using d as the instrument of d.

TABLE 5.3 *B*

MODIFIED CONTROL-GROUP ESTIMATES OF PROGRAM EFFECTS[a/]
(constant prices)
(1985-88 relative to 1981-84)

	C	*GDP2*	*INV2*	*SAVDOM2*	*EXP2*	*RER2*	*FISC2*	*SHOCK3*	*d*
Change in GDP Growth	*0.009*	*-0.750*	*0.057*	*-0.030*	*-0.015*	*0.000*	*0.028*	*0.026*	*0.020*
	(0.625)	*(-11.480)*	*(1.521)*	*(-0.989)*	*(-0.708)*	*(0.643)*	*(0.883)*	*(0.459)*	*(2.561)**
Change in Investment/GDP	*0.027*	*0.006*	*-0.343*	*0.092*	*-0.022*	*0.000*	*-0.052*	*0.081*	*0.001*
	(0.908)	*(0.063)*	*(-4.986)*	*(1.635)*	*(-0.662)*	*(0.360)*	*(-0.860)*	*(0.806)*	*(0.039)*
Change in Saving/GDP	*-0.026*	*0.116*	*0.095*	*-0.238*	*0.069*	*0.000*	*-0.029*	*0.128*	*0.037*
	(-0.702)	*(0.860)*	*(0.795)*	*(-2.714)*	*(1.249)*	*(0.306)*	*(-0.312)*	*(1.199)*	*(2.186)***
Change in Exports/GDP	*-0.006*	*0.086*	*0.035*	*0.027*	*0.069*	*-0.000*	*0.000*	*0.063*	*0.025*
	(-0.219)	*(0.817)*	*(0.494)*	*(0.508)*	*(1.522)*	*(-0.849)*	*(0.006)*	*(0.688)*	*(1.640)*****

Note: The t-values are in parentheses.
** Statistically significant at the 2.5 % level.*
*** Statistically significant at the 5 % level.*
**** Statistically significant at the 7.5 % level.*
***** Statistically significant at the 10 % level.*
a/ Estimation of equation (9), using d as instrument of d.

Appendix A

All the data used in the analysis are taken from the World Bank's ANDREX data base except the real exchange rate, which is from IMF statistics. The sample consists of 77 developing countries, listed in Table B by group and by middle- and low-income. The sample period is 1970-88.

The variables are defined for three periods: (1970-80, first; 1981-84 second; and 1985-88 third. The number following the variable is the period, i.e., GDP1 is the rate of GDP growth in period 1. Variables with a number 4 mean period 3 relative to period 1, with number 5, period 3 relative to period 2, and with number 6, period 2 relative to period 1).

Following is a description of the variables:

(i) For periods 1, 2 and 3

GDP_ : rate of GDP Growth

INV_ : domestic investment to GDP ratio

SAVDOM_ : domestic saving to GDP ratio

EXP_ : total exports to GDP ratio

(ii) Defined for periods 1 and 2

RER_ : real exchange rate index

FISC_ : fiscal deficit to GDP ratio

(iii) Others

SHOCK1 : total external shock (positive), period 2 relative to period 1.

SHOCK2 : total external shock (positive), period 3 relative to period 1.

SHOCK3 : total external shock (positive), period 3 relative to period 2.

NETF6 : change in non-official external financing to GDP ratio, period 2 relative to period 1.

(iv) Dummy variables

D : 1 for EIAL countries (program countries), 0 otherwise

D1 : 1 if a country has a recurrent program with IMF, 0 otherwise

D2 : 1 if a country is African, 0 otherwise

D3 : 1 if a country is Latin American, 0 otherwise

D6 : 1 if a country is middle-income, 0 otherwise

D7 : 1 if a country highly indebted, 0 otherwise

DINFLAC : 1 if a country had a rate of inflation over 60% in period 2, 0 otherwise.

TABLE A.1

COUNTRY CLASSIFICATION

I. EIAL (Early Intensive Adjustment Lending 25 Countries)a/

Bolivia *
Brazil
Chile
Colombia
Costa Rica
Cote d'Ivoire
Ghana *
Jamaica
Kenya *
Korea, Republic of
Madagascar *
Malawi *
Mauritania *
Mauritius
Mexico
Morocco
Nigeria *
Pakistan *
Philippines
Senegal *
Tanzania *
Thailand
Togo *
Turkey
Zambia *

II. OAL (Other Adjustment Lending 25 Countries)b/

Argentina
Bangladesh *
Burkina Faso *
Burundi *
Central African Republic *
China *
Congo, People's Republic of the
Ecuador
Guinea *
Guinea-Bissau *
Guyana *
Honduras
Hungary
Indonesia
Mali *
Niger *
Panama
Sierra Leone *
Somalia *
Sudan *
Tunisia
Uruguay
Yugoslavia
Zaire *
Zimbabwe

III. NAL (No Adjustment Lending 28 Countries)c/

Algeria
Benin *
Botswana
Cameroon
Dominican Republic
Egypt, Arab Republic of
El Salvador
Ethiopia *
Greece
Guatemala
Haiti *
India *
Jordan
Liberia *
Malaysia
Myanmar *
Nicaragua
Oman
Papua New Guinea
Paraguay
Peru
Portugal
Rwanda *
Sri Lanka *
Syrian Arab Republic
Trinidad and Tobago
Venezuela
Yemen Arab Republic *

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a/ EIAL are countries that have received 2 SALs or 3 or more adjustment operations, with the first adjustment operation in 1985 or before.
b/ OAL are other adjustment lending countries.
c/ NAL are countries that did not receive AL in the period 1980 to 1989.
* Low-income countries that are IDA countries; and middle-income countries are non-IDA countries.

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TABLE A. 2

INDICATORS OF PERFORMANCE: EIAL COUNTRIES

	GDP1	GDP2	GDP3	INV1	INV2	INV3	SAVDOM1	SAVDOM2	SAVDOM3	EXP1	EXP2	EXP3
Bolivia	0.048	-0.027	0.000	0.223	0.108	0.091	0.208	0.174	0.091	0.294	0.261	0.250
Brazil	0.084	-0.005	0.048	0.238	0.178	0.176	0.210	0.190	0.221	0.079	0.119	0.128
Chile	0.024	-0.007	0.053	0.161	0.139	0.149	0.145	0.109	0.173	0.158	0.231	0.265
Colombia	0.059	0.020	0.04[illegible]	0.186	0.209	0.17[illegible]	0.192	0.171	0.211	0.155	0.138	0.177
Costa Rica	0.058	0.003	0.037	0.222	0.166	0.[illegible]	145	0.167	0.215	0.275	0.301	0.310
Cote d'Ivoire	0.062	-0.002	0.014	0.200	0.164	0.	[illegible]17	0.161	0.158	0.350	0.356	0.310
Ghana	-0.001	-0.016	0.053	0.072	0.048	0.[illegible]	071	0.042	0.045	0.132	0.073	0.082
Jamaica	-0.011	0.013	0.008	0.264	0.190	0.16[illegible]	.188	0.097	0.119	0.453	0.503	0.712
Kenya	0 058	0.022	0.062	0.306	0.214	0.18[illegible]	0.261	0.191	0.178	0.371	0.261	0.255
Korea, Rep. of	0.095	0.088	0.106	0.288	0.310	0.322	0.280	0.290	0.391	0.242	0.370	0.421
Madagascar	0.003	0.031	0.020	0.198	0.101	0.108	0.107	0.000	0.010	0.155	0.099	0.096
Malawi	0.063	0.014	0.023	0.320	0.193	0.120	0.168	0.148	0.094	0.227	0.208	0.231
Mauritania	0.017	0.004	0.037	0.282	0.375	0.257	0.078	-0.012	0.172	0.372	0.469	0.533
Mauritius	0.066	0.040	0.089	0.297	0.208	0.328	0.296	0.197	0.395	0.527	0.470	0.580
Mexico	0.052	0.019	0.005	0.227	0.210	0.154	0.207	0.244	0.191	0.098	0.142	0.167
Morocco	0.056	0.027	0.056	0.251	0.241	0.242	0.148	0.144	0.202	0.214	0.180	0.187
Nigeria	0.065	-0.047	0.027	0.194	0.159	0.079	0.207	0.119	0.089	0.223	0.112	0.122
Pakistan	0.047	0.066	0.067	0.190	0.190	0.187	0.096	0.147	0.178	0.129	0.132	0.144
Philippines	0.063	0.004	0.020	0.264	0.254	0.146	0.230	0.205	0.164	0.182	0.207	0.260
Senegal	0.025	0.031	0.044	0.184	0.158	0.146	0.088	0.010	0.025	0.268	0.298	0.246
Tanzania	0.051	0.006	0.036	0.256	0.208	0.200	0.162	0.110	0.075	0.194	0.131	0.102
Thailand	0.072	0.062	0.068	0.273	0.261	0.241	0.221	0.209	0.221	0.217	0.250	0.317
Togo	0.034	-0.017	0.032	0.338	0.248	0.215	0.267	0.201	0.124	0.269	0.453	0.433
Turkey	0.059	0.047	0.062	0.220	0.204	0.204	0.140	0.142	0.150	0.072	0.154	0.212
Zambia	0.007	0.002	0.029	0.411	0.149	0.148	0.447	0.113	0.145	0.466	0.367	0.342
Average	0.048	0.015	0.042	0.243	0.195	0.177	0.187	0.148	0.161	0.247	0.251	0.275

Note: GDP_: rate of growth of GDP; INV_: gross domestic investment to GDP ratio; SAVDOM_: gross domestic saving to GDP ratio; EXP_: total exports to GDP ratio. The numbers after the variables mean period 1, period 2 and period 3.

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