

**The implementation of policy conditions in structural adjustment programmes:
The case of Sub-Saharan African countries**

Farhad Noorbakhsh and Alberto Paloni

*Department of Economics
University of Glasgow*

f.noorbakhsh@socsci.gla.ac.uk
a.paloni@socsci.gla.ac.uk

Abstract

If, as some recent research seems to suggest, the economic performance of countries that comply with World Bank conditionality is significantly better than that of countries that do not comply, then an important topic for research is the identification of factors that increase the likelihood of programme countries' compliance. This paper starts research in this area by employing data recently released by the World Bank that allow a classification of Sub-Saharan African programme countries according to their compliance with adjustment lending conditionality. The empirical results are sensible and have important implications for the design and management of policy-based lending.

1. Introduction

From their onset in the early 1980s a vast amount of literature has been devoted to the assessment of the effects of structural adjustment programmes. This effort is understandable in view of the sheer number of countries engaged in these programmes and the amount of resources involved. In Sub-Saharan Africa alone, thirty-seven countries have engaged in structural adjustment programmes. Structural adjustment lending in the region has totalled \$15 billion (World Bank, 1997).

In view of this it is very surprising that the economic literature has devoted no attention whatsoever to the identification of characteristics that may distinguish countries that comply with the policy conditions set out in adjustment programmes from countries that, despite their formal commitment to structural adjustment, do not comply with conditionality.

It should be obvious that the identification of such characteristics may significantly aid in the design of appropriate policy measures, especially if, as some research seems to suggest (World Bank, 1994; Bouton, Jones and Kiguel, 1994; Noorbakhsh and Paloni, 1998a), the performance of compliers is significantly better than that of non-compliers.

One explanation for the lack of research in this area - especially outside the World Bank - may have been the lack of data on countries' compliance with conditionality. The World Bank (1997), however, published a classification of Sub-Saharan countries based on their degree of compliance with policy conditions during their adjustment period. This classification is at the core of this paper.

Thus, the objective of this paper is to begin to fill an important vacuum in the literature by attempting to identify the factors that influence programme countries' compliance with adjustment lending conditionality. Section 2 discusses the importance

of focusing research on programme countries' compliance. The index of compliance used in this paper is also presented here. Section 3 describes the methodological approach. Section 4 is a review of the literature on the characteristics of countries that engage in reform programmes. It is argued that, although such characteristics are common to both compliers and non-compliers, this review may give some hints about the identification of factors that make compliance more likely. Possible determinants of compliance are fully discussed in Section 5. Section 6 presents the results of the empirical analysis. Section 7 draws policy implications and conclusions.

2. The importance of compliance with conditionality

A number of researchers, both within and outwith the World Bank, have made the case that a proper evaluation of structural adjustment programmes should take into account the degree with which programme countries have implemented the policy conditions attached to these programmes (for instance, see Summers and Pritchett, 1993; Mosley, Harrigan and Toye, 1991).

In the early assessment of its adjustment lending operations the World Bank had a different approach and identified reforming countries simply with the programme countries¹ or with those programme countries (also called "EIAL") that had borrowed from it more extensively and for longer periods than other programme countries.² However, this approach is not very satisfactory since programme countries implemented the recommended policies to different extents. Moreover, some countries in receipt of adjustment loans abandoned reforms early or were on-again/off-again reformers. Thus, not all programme or EIAL countries should be bundled in the same category of reformers (Summers and Pritchett, 1993).

In its high-profile work on the Sub-Saharan African programme countries, the

World Bank (1994) - as well as its update by Bouton, Jones and Kiguel (1994) - concentrated on the policies actually implemented by the programme countries of the region and classified them according to the extent of their macroeconomic reforms. These studies showed that those countries that made the largest adjustments in their macroeconomic policy stance had better macroeconomic performance than the countries that had implemented less resolute macroeconomic reforms.

However, it should be emphasized that adjustment programmes include a vast array of policies in addition to macroeconomic policies and an assessment of the effectiveness of structural adjustment programmes should take into account the degree of compliance with conditionality in all of these policy areas. The general unavailability of data in this respect has been partially eased by a World Bank publication (1997), where Sub-Saharan African programme countries are classified on the basis of their compliance with policy conditions in all areas of the programme.

This classification is based on an index of overall compliance. To compute the index, the policy measures normally included in structural adjustment programmes have been classified under three headings, namely macroeconomic stabilization, public sector management and private sector development.

Macroeconomic stabilization includes all conditions regarding fiscal deficit reduction, fiscal revenues, public expenditure levels, exchange rate, etc. Public sector management includes measures for civil service reform, public expenditure reform and public enterprise restructuring and privatization. The measures under private sector development concern financial sector reform, trade policy reform, pricing policies and incentives, and regulatory environment.

In a second step, compliance with measures in each of these three groups has been rated from 1 (highest) to 4 (lowest). The country index for overall compliance has

finally been constructed by averaging the ratings for the individual groups. On the basis of this index, the World Bank classifies countries as *good*, *weak* or *poor* compliers.

Using this index of compliance, Noorbakhsh and Paloni (1998a) found that compliance is an important determinant of economic performance after controlling for the role of the external environment, initial economic conditions, social factors and other country-specific conditions.

The findings in both the World Bank (1994) study and Noorbakhsh and Paloni (1998b) point to an important area for research. If adjustment programmes give significantly better results in countries that implement the policy conditions set out in the programmes than in countries that do not implement those conditions, then the effectiveness of adjustment lending could be raised by an understanding of what factors affect countries' compliance with conditionality.

If such factors are exogenous and beyond the World Bank's influence, the countries that are less likely to implement an agreed programme should be identified so that scarce resources can be switched from potential non-compliers to potential compliers. If, as more likely, at least some of those factors are endogenous and can be affected by the World Bank - for instance through the modification of certain 'unsuccessful' aspects of programmes - then the outcome of programmes would be closer to the desired one.

The compliance index as the basis for a research on the determinants of compliance is however liable to various criticisms.³ First, the assessment of the degree of compliance is inevitably subjective. Second, averaging the compliance scores may, in certain cases, change the ranking of countries if the arbitrary number of categories (four) for the scores is altered. Third, the ordinality of the index makes it impossible to establish if the difference between two countries' scores is small or large, at least

within certain ranges. Finally, the procedure of averaging the ratings in the three policy groups by assigning them equal weights is arbitrary.

These criticisms question the use of the index and the associated country classification in good, weak and poor compliers. Nevertheless the force of these criticism is in practice significantly reduced if the index is used as a blunt instrument to separate compliers from non-compliers without trying to identify degrees of compliance. Thus, in this paper, Sub-Saharan programme countries have been classified simply as compliers or non-compliers on the basis of the overall index of compliance. No distinction has been made between good and weak compliers, unlike the World Bank (1997) paper. (The country typology as compliers and non-compliers is reported in Appendix A).

3. Methodology

As explained, the objective of this study is to determine what affects programme countries' tendency to comply with conditionality. The problem is that the tendency to comply cannot be observed directly. What can be observed is a binary variable that crudely separates countries into a group of compliers and a group of non-compliers on the basis of certain behaviour that is assumed to reflect the unobservable tendency to comply.

An appropriate methodology under these circumstances is that of the logit regression framework.⁴ The logit model has been widely employed in psychology, sociology, medical and biological sciences but, until recently, relatively less used in economics. It may be useful to provide some justification for its use in the context of compliance with structural adjustment programmes.⁵

We assume that a continuous variable *tendency to compliance*, Z^* , is a linear function of a set of conditions (vector x) with an error term \mathbf{e}_1 as in regression equation:

$$Z^* = x'\mathbf{b}_1 + \mathbf{e}_1 \quad (1)$$

where x' is a row vector whose first element is 1 and the other elements are explanatory variables; \mathbf{b}_1 is a column vector of parameters.

The *threshold* to compliance, Z^\oplus , is then:

$$Z^\oplus = x'\mathbf{b}_2 + \mathbf{e}_2 \quad (2)$$

where \mathbf{b}_2 is the appropriate vector of parameters and \mathbf{e}_2 is the corresponding error term for the threshold. It follows that:

$$Y = 1 \text{ if } Z^* > Z^\oplus \text{ and } Y = 0 \text{ otherwise}$$

where Y is a binary variable that separates countries into groups of compliers ($Y = 1$) and non-compliers ($Y = 0$).

Then, the probability function for compliance is:

$$\begin{aligned} P(Z) = P(Y = 1) &= P(Z^\oplus < Z^*) = P((\mathbf{e}_2 - \mathbf{e}_1) < x'(\mathbf{b}_1 - \mathbf{b}_2)) = \\ &= 1 - F(x'(\mathbf{b}_1 - \mathbf{b}_2)) \end{aligned} \quad (3)$$

$P(Z)$ indicates that the probability of compliance is a function of Z , where Z itself is a linear function of k explanatory variables. $P(Y = 1)$ - henceforth $P(\cdot)$ - denotes the probability of the event of compliance taking place.

The term $(\mathbf{e}_2 - \mathbf{e}_1)$ has a cumulative distribution function, F , which with an appropriate specification may be expressed as a logistic function. In this case, countries change binomially from the state of non-compliance ($Y = 0$) to compliance ($Y = 1$) as Z increases over its range. Y has a symmetric cumulative density function

around its midpoint; that is, Y varies between 0 and 1 with a sigmoid or S-shaped curve around its midpoint as Z ranges between $-\infty$ and $+\infty$.

Under these circumstances, the probability of compliance for a country can then be presented as:

$$P(\cdot) = \frac{e^Z}{1 + e^Z} = \frac{1}{1 + e^{-Z}} \quad (4)$$

Equation (4) has a cumulative distribution function of *logistic* form. It postulates that the effect of a set of conditions (variables) on tendency towards compliance is an exponential function of the strength of such conditions (variables).

The *odds (odds ratio)* in favour of compliance for a country can be expressed as the ratio of probability of compliance to the probability of non-compliance as follows:

$$\frac{P(\cdot)}{1 - P(\cdot)} = \frac{1 + e^Z}{1 + e^{-Z}} = e^Z \quad (5)$$

The natural logarithm of (5) will result in:

$$L = \ln\left(\frac{P(\cdot)}{1 - P(\cdot)}\right) = Z \quad (6)$$

where L is the *logit* and reflects the log of odds ratio. Equation (6) clearly shows that as Z changes between $-\infty$ and $+\infty$ L does the same though probabilities are bounded between 0 and 1.

Equation (6) shows that the estimated parameter \mathbf{b}_k gives the change in the log of odds for a unit change in the k^{th} explanatory variable of Z . Then, the exponential of \mathbf{b}_k is the factor by which the odds change for a unit change in the explanatory variable k . A positive (negative) value of \mathbf{b}_k results in an increase (decrease) in odds

in favour of compliance. After estimating Z , the probability of compliance for each country may be estimated from equation (4).

Another way of justifying the logit model is to present it within the framework of the *utility* model with discrete choice. With respect to compliance countries enjoy two different levels of utility: U_1 , the utility of the state of compliance ($Y = 1$), and U_0 , the utility of the state of non-compliance ($Y = 0$). We then have the following corresponding equations:

$$U_1 = x' \mathbf{b}_1 + \mathbf{e}_1 \quad (7)$$

$$U_0 = x' \mathbf{b}_2 + \mathbf{e}_2 \quad (8)$$

We assume that compliance initially carries a higher utility than non-compliance. This assumption can be justified on the grounds that countries agree with the suggested programmes in the first place. Equation (3) can be re-written as:

$$\begin{aligned} P(Z) = P(Y = 1) &= P(U_0 < U_1) = P((\mathbf{e}_2 - \mathbf{e}_1) < x'(\mathbf{b}_1 - \mathbf{b}_2)) = \\ &= 1 - F(x'(\mathbf{b}_1 - \mathbf{b}_2)) \end{aligned} \quad (9)$$

The logistic function can again be suggested as an appropriate specification of the cumulative probability distribution of the term $(\mathbf{e}_2 - \mathbf{e}_1)$ such that Y is binary depending on the value of utility, where the latter in turn is a function of a set of explanatory variables.

In general, we have a continuous *latent* variable which in principle is not observable. However, it is regarded as being a function of a set of conditions which in turn, at a certain level, would result in compliance with structural adjustments programmes. Changes in these conditions, or stimulants, have an increasing effect, at a constant rate, on the likelihood of compliance.⁶

The likelihood function - corresponding to equations (3) and (9) - to be maximised is:

$$L = \prod_{Y=1} (1 - F(x'(\mathbf{b}_1 - \mathbf{b}_2))) \prod_{Y=0} F(x'(\mathbf{b}_1 - \mathbf{b}_2)) \quad (10)$$

Given the logistic form of the cumulative probability distribution function of $(e_2 - e_1)$ this can also be written as:

$$L = \prod_{Y=1} \frac{1}{1 + e^{-Z}} \prod_{Y=0} \frac{1}{1 + e^Z} \quad (11)$$

That is, the parameters of Z are estimated such that the observed results will be the most *likely* outcomes.

The treatment of the sample period in this paper warrants some comments. In many evaluation studies of the effectiveness of World-Bank supported adjustment programmes, the sample period has been selected by identifying a specific date as the beginning of the adjustment period for all countries. For example, World Bank (1994) fixes the beginning of structural adjustment lending in Africa at 1986. The same procedure is followed in Corbo and Rojas (1992) to investigate both the determinants of participation in World Bank programmes and the effectiveness of these programmes, although they fix the beginning of the adjustment period at 1985.

This approach, however, is not appropriate since countries undertook structural adjustment programmes at different times, with some countries completing their operations before other countries had even begun theirs. Thus, in this paper, the sample period varies in accordance with each country's actual adjustment period.

The approach adopted in this paper is cross-sectional. The use of panel data is made impossible by the nature of the dependent variable: this is fixed and does not have time-series variation. The sample period for each country is divided into a pre-programme and a programme period, each having a five-year duration. The choice of a

five-year adjustment period is the same as that in World Bank (1997). Though this is quite arbitrary, it should be pointed out that no consent has emerged in the literature about an optimal length: for example, Corbo and Rojas (1992) use a four-year periodization, while Bouton, Jones and Kiguel (1994) a six-year one. Since the length of the pre-adjustment period also varies across papers, the choice made here is to have adjustment and pre-adjustment periods of equal lengths. (Adjustment and pre-adjustment periods for each country are presented in Appendix B).

4. The characteristics of programme countries

It is fair to say that, overall, only a limited amount of research has addressed the question whether identifiable characteristics exist that distinguish countries that turn to the international financial organizations for support from those that choose a more autonomous path. Moreover, practically all of the studies in this area were concerned with the determinants of participation in *IMF* programmes. Corbo and Rojas (1992) is, to our knowledge, the only study that examined the factors affecting a country's decision to undertake a *World Bank*-supported adjustment programme.

The variables they found to be important were: the value of the external shock⁷ during the programme period (1981-84) with respect to the pre-programme period (1970-80); the change in the ratio of the current account surplus to GDP between the programme and the pre-programme period; the change in the ratio of total debt to GDP between the programme and the pre-programme period; the level of investment in the programme period; the level of the real exchange rate in the programme period; and a group of dummy variables - if the country had a programme with the IMF, if it was a Latin American country,⁸ if it was highly indebted, and if it had a rate of inflation of over 60 percent per year during the programme period.

Unfortunately, no explanation for the inclusion of those variables is reported in their paper, except for the rate of inflation.⁹ With respect to this variable, they argued that countries with high levels of inflation were expected to be less likely to undertake a programme because, before receiving a loan from the World Bank, they would have to have achieved a certain level of progress in reducing their internal disequilibrium. If one accepts this explanation, it should perhaps be recognized that the sign of the coefficient of inflation may then not be determined *a priori* since one could equally argue that countries with poorer economic performance, for example higher inflation, are more likely to enter a programme.¹⁰

The justification for the inclusion of the other variables is left to guesswork. It may be argued that a country is more likely to undertake a World Bank programme if it has been hit by a negative shock and is in external disequilibrium, as expressed by current account deficits and debt burdens.¹¹

A country with a relatively low ratio of gross investment to GDP may be more likely to undertake structural adjustment. A low investment ratio may indicate not only limited access to international capital markets but also limited imports of capital and intermediate goods as well as distorted domestic credit markets.¹²

The probability of programme participation was found to be positively correlated with a more depreciated real exchange rate during the programme period. This raises obvious issues of simultaneity since the real exchange rate is likely to depreciate more in programme countries during their adjustment period than in other countries. One explanation for the positive correlation that does not encounter a simultaneity problem may be that the depreciation of the real exchange rate less than fully reflects the depreciation of the equilibrium rate.¹³

The finding that countries with an IMF programme are more likely to

undertake a World Bank programme may reflect the fact that an agreement with the IMF is often a precondition for a Bank programme or may be seen as a proxy for a host of political and social characteristics: the fact that the country has already entered an agreement with the IMF may imply that certain political and social conditions for the acceptance of an adjustment programme are already in place or may simply indicate that the country is already familiar with the modalities of dealing with international financial institutions.

Finally, Latin American countries were found to be less likely to undertake a World Bank programme. This may also be related to some political and social characteristics.

Studies on the factors affecting participation in IMF programmes highlight dimensions that are broadly similar to those raised by Corbo and Rojas (1992) with respect to World Bank programmes (see Conway, 1994; Edwards and Santaella, 1993;¹⁴ Joyce 1992; Knight and Santaella, 1997; McDonald, 1986). Empirically, these dimensions appear to have some robustness, though the different variables that have been used to measure the dimensions do not.

To somewhat summarize their findings, these studies point to five major dimensions affecting the decision to undertake an IMF programme. The first is the deterioration in the economic performance. This has been measured by a number of variables such as the current account balance (as a proportion of GDP), the rate of growth of GDP (or GDP per capita), export growth, the investment to GDP ratio, inflation, and the real exchange rate.

A second factor affecting programme participation is the occurrence of adverse external shocks. These have been modelled by the growth in export markets, the growth in terms of trade and the world real rate of interest for the country. However,

only the latter has been reported as significant in one study, i.e. Conway (1994).

A third determinant of programme participation is a country's ability to implement an adjustment programme autonomously. This has been measured by the level of GDP per capita¹⁵ - to reflect the fact that richer countries will be less reliant on IMF funds and will be more able to change the level of expenditures - or by the country's GDP per capita relative to that of the United States - to denote the availability of technical expertise.

The fourth factor affecting the decision whether to seek financial support from the IMF is the deterioration in the ability to finance an external deficit. The stock of international reserves (as a proportion of imports) consistently turns out to be a significant variable. Other variables that are significant only in some studies and are not always used are: the external debt service (as a proportion of exports), the debt to GDP ratio, net FDI as a proportion of GNP, the net foreign assets ratio.

Finally, previous participation in IMF programmes and the amount of funds drawn down in such programmes are important determinants.

In certain studies, the estimated regression included indicators of domestic policies such as the expansion of domestic credit, the government to GDP ratio and the (rate of change of the) nominal exchange rate.¹⁶

Unlike the other studies, Edwards and Santaella (1993) included political and institutional variables. They argued that countries with more stable political regimes, dictatorial regimes and left-leaning governments are less likely to seek IMF assistance. However, their attempt was overall not very successful since, with the exception of the frequency of attempted coup d'état - a proxy for political instability - none of the other four political and institutional variables included was significant at normal confidence levels.

Edwards and Santaella (1993) also attempted to identify the circumstances under which devaluation programmes are more likely to end up in failure. They argued that the reasons for the adoption of inconsistent macroeconomic policies should be sought in the characteristics of these countries' political systems. However, none of the variables reflecting political instability, political weakness, political ideology, democracy or IMF presence turned out statistically significant.

5. Determinants of compliance

In the absence of previous work in this area, the identification of determinants of compliance can only proceed by intuition. In this respect the previous section has been useful in highlighting the major characteristics of programme countries. On one hand these characteristics equally apply to compliers and non-compliers and cannot, therefore, be considered as possible determinants of compliance. On the other hand, however, they provide some hints as to what factors are likely to be important.

As a rough organizing principle, the outcome of compliance may be seen as depending on both the *willingness* and the *capacity* to comply.¹⁷ In this paper it is suggested that the capacity to comply is affected by two main factors. One is the extent of the internal and external disequilibria facing the country. If, as documented in the previous section, programme countries undergo a deterioration in economic performance during the pre-programme period both domestically and externally, it is likely that the seriousness of the crisis will affect compliance. On one hand it may be argued that the deeper the crisis, the more a country will strive to pursue an adjustment (Drazen and Grilli, 1993).¹⁸ On the other hand, it may also be the case that compliance is made more difficult in an extensive crisis, especially if the required adjustment is large.¹⁹

In this paper, two variables have been chosen to represent the depth of the crisis, namely the growth in the real effective exchange rate in the pre-programme period and the fiscal balance in the pre-programme period. These particular variables have been chosen not only as proxies for external and internal disequilibria but also because their adjustment involves unpleasant trade-offs. Real exchange rate appreciation causes external deficits but, on the other hand, helps repress inflation. Structural reforms call for an adjustment in the real exchange rate at the cost of increasing the debt burden and raising inflation. Larger budget deficits require larger expenditure cuts that are more difficult in situations where the room for raising revenue through taxation is limited and where government expenditure is rather inflexible because the state is a major employer and the only provider of social services. In this case, policymakers have to weigh the need for adjustment against the risk of possible political unrest.

The second factor determining the capacity to comply is the occurrence of negative exogenous shocks.²⁰ For African countries, important shocks are represented by gyrations in their terms of trade. In this paper, the shock variable is measured as the growth in terms of trade between the programme and the pre-programme period. This particular formulation has the advantage that it captures the occurrence of shocks in the programme period as well as the reversion to 'normal' values after a shock during the pre-programme period.

The willingness to comply may be determined by a number of factors. It could be argued that the amount of funds potentially available to a country as a result of compliance with policy conditions will affect a country's willingness to comply. A variable that reflects the availability of funds is the ratio of adjustment lending commitments to GNP. It is suggested that the larger the commitments, the greater the

effort that the country will make in attempting to comply with the policy conditions.

A second factor that may affect compliance is the country's economic performance during the adjustment period. Although one could make the argument that if the economy is recovering countries may be tempted to relax austerity, it is also possible that compliance with structural adjustment measures is made easier by good economic performance (Mosley and Weeks, 1993). The variable chosen to represent this is the growth rate of GDP during the programme. Under certain conditions, this choice may or may not introduce a simultaneity bias.²¹

The willingness to comply with conditionality is also determined by political and social characteristics. It should be noted, however, that the political economy literature is of limited help in identifying relevant variables since it is typically concerned with "why" or "when" a country chooses to reform and very rarely with the question why a country initiates a reform but then subsequently chooses not to implement the reform package.

In addition to the fact that this literature provides few unequivocal indications on the type of governments that are more likely to comply with the conditions attached to an adjustment programme, there is also the problem that the political economy variables used in the empirical literature are often in the form of decade averages or are measured at a precise point in time, which is unsuitable for describing characteristics during the programme period.

Nevertheless, this literature provides a particularly useful insight for the purpose of this paper: the success of structural reforms will depend upon the investment response of the private sector. If the private sector believes that structural reforms will be sustained, it will react to the new price signals by investing and the reforms will succeed. If reforms are not believed to be sustainable or their future is

uncertain, the private sector will hold back investment and the reforms will be abandoned (Dornbusch, 1991). There are many reasons that may lead to such expectations about the future of structural reforms, namely political instability, lack of government credibility, high inequality in the distribution of the expected costs and benefits of reforms, etc.

A variable that may capture these political economy arguments is the change in the gross domestic investment to GDP ratio between the programme and the pre-programme period. It should perhaps be noted that the inclusion of this particular variable may also be justified on the basis of other considerations. For example, an increase in the investment ratio may be the result of improved access to international capital markets.

Another factor that may determine compliance with policy conditionality is the country's degree of development, which could be approximated by its level of income. In low income countries a contraction in the role of government and a re-orientation of its expenditure are more difficult. Moreover, since standards of living are lower it is more difficult to implement and to muster support for structural reforms that tend to bring about benefits only after an initial period of austerity. A dummy variable taking value one for low income countries and zero otherwise has been used in the regressions.

6. The empirical results

The results of the logistic model regression for the determinants of compliance are presented in Table 1.

Table 1. Logistic regression results

Variable	Coefficient	Standard error	Wald Statistic	Level of significance
	(1)	(2)	(3)	(4)
<i>ALCGNP</i>	5.057	2.484	4.144	0.042
<i>TOTg</i>	0.241	0.139	3.015	0.082
<i>gRER₋₁</i>	0.370	0.204	3.283	0.070
<i>dIGDP</i>	0.468	0.293	2.552	0.110
<i>gGDP</i>	1.558	1.046	2.217	0.136
<i>FBGDP₋₁</i>	0.767	0.558	1.885	0.170
<i>Lidum</i>	-8.944	5.261	2.890	0.089
<i>Constant</i>	0.807	4.211	0.037	0.848

The estimated coefficients have sensible signs and according to the Wald Statistic are statistically significant at worst at the 17 percent confidence level.²² The constant is not significantly different from zero.²³

The results show that a larger real appreciation of the exchange rate and a larger budget deficit in the pre-programme period (lower *gRER₋₁* and *FBGDP₋₁*) make compliance less likely. On the other hand, a larger adjustment package (higher *ALCGNP*) increases the chances that countries would strive to comply with policy conditions. The probability of compliance increases in a more favourable economic environment: better growth performance of the economy (higher *gGDP*) and more favourable terms of trade (higher *TOTg*) improve the likelihood of compliance with conditionality.

The increase in the investment to GDP ratio between the programme and the pre-programme period (*dIGDP*) also makes compliance more likely. It should be pointed out that the fact that both GDP growth and the investment ratio are significant

at the same time suggests that the increase in the investment ratio should not be interpreted simply as a proxy for economic recovery but more as a reflection of the influence of other factors, such as political economy conditions. Finally, low income countries (*LIdum*) are significantly less likely to comply.

Since the logit model is non-linear, the partial effects on compliance deriving from unit changes in one of the regressors while keeping the others constant are not equal to the estimated coefficients. Table 2 reports these computed partial effects on both the odds in favour of compliance and the associated probability of compliance.

Table 2. Partial effects on odds and probability of compliance

Variable	Factor of change in odds (1)	Factor of change in probability (2)	Elasticity of odds (3)	Elasticity of probability (4)
<i>ALCGNP</i>	157.116	1.134	16.278	1.940
<i>TOTg</i>	1.272	1.026	3.012	0.359
<i>gRER₋₁</i>	1.448	1.038	0.071	0.008
<i>dIGDP</i>	1.596	1.047	1.185	0.141
<i>gGDP</i>	4.749	1.104	3.054	0.364
<i>FBGDP₋₁</i>	2.153	1.068	4.927	0.587
<i>LIdum</i>	1.31E-04	-1.135	-	-

Column (1) of this table reports the factor by which the odds in favour of compliance would change for a unit change in a relevant explanatory variable.²⁴ For example, for a 1 percentage point (a unit) increase in the ratio of adjustment lending commitments to GNP the odds in favour of compliance would increase by a factor of 157.12, while an increase of 1 percentage point in the growth rate of real GDP in the adjustment period would increase the odds in favour of compliance by a factor of 4.75.

Column (1) shows that a country's income status has a large effect on odds: everything else equal, the odds of compliance for a low income country are 0.001 times smaller than for a middle income country.

Since the concept of probability may be somewhat more intuitive than that of odds, Column (2) reports the factor by which the probability of compliance would change for a unit change in explanatory variables. This factor of change in probability has been calculated by taking as the initial level of probability that of a low income country when all explanatory variables are at their mean values.²⁵

Column (2) shows that, for a country where the explanatory variables are at their mean values, adjustment lending commitments and income status have, quantitatively, practically the same impact on the probability of compliance. These variables have stronger effects on the probability of compliance than any other variable. The third variable in order of importance is the growth rate of GDP during the adjustment period.

Since a unit change can be a large amount for some explanatory variables and a small one for others, the relative size of these changes on odds and probability of compliance is obviously influenced by the scales of the individual explanatory variables. To have a scale-free measure one can compute the elasticity of odds in favour of compliance²⁶ and the elasticity of the probability of compliance²⁷ with respect to changes in the explanatory variables: these are reported in Column (3) and (4) respectively. The reported elasticities have been calculated at the means of the explanatory variables.

The results show that a one percentage change in the adjustment lending commitment to GNP ratio will increase the odds in favour of compliance by 16.3 percent and the probability of compliance by 1.9 percent. These effects are stronger

than for any other variable.²⁸ The second largest elasticities are those with respect to the fiscal balance to GDP ratio in the pre-adjustment period. Next are the elasticities with respect to the rate of growth of GDP and the rate of growth of terms of trade. Quantitatively, these are similar. Smaller elasticities are those with respect to the change in the investment to GDP ratio and the rate of growth of the real exchange rate during the pre-programme period.

The goodness of fit of the model can be gauged in a number of ways. The null hypothesis that all coefficients excluding the constant are jointly equal to zero is rejected at the 1 percent confidence level:²⁹ this indicates that the overall fit of the estimation is good.

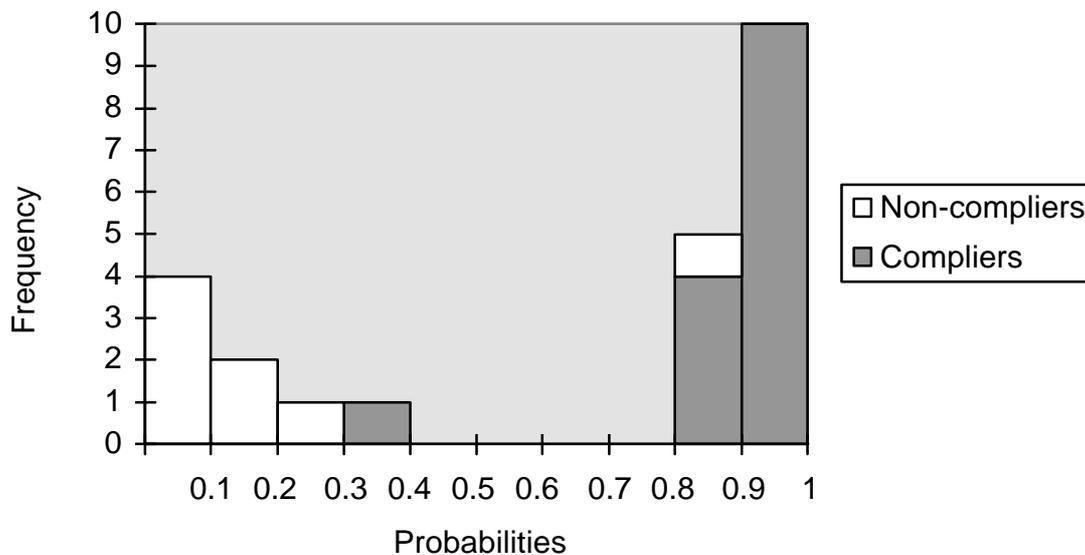
Since the model can be used to forecast a country's likelihood of compliance on the basis of certain variables, it is important to assess the forecasting performance of the model further. One method evaluates the accuracy of the model predictions with respect to the observed outcomes. Table 3 presents cross-tabulations of the predicted number of compliers and non-compliers against the observed frequency of these cases. As can be seen from this table, the model correctly predicts 21 of the 23 cases considered: this gives an accuracy ratio of 91.3 percent.³⁰ The logit regression shows one 'false positive' (prediction of compliance when in fact there was no compliance) and one 'false negative' (prediction of non-compliance when the country complied). The countries concerned are Chad and Burkina Faso, respectively.

Table 3. Accuracy of the predicting equation.

Predicted	No compliance	Compliance	Percent correct
Observed			
No compliance	7	1	87.5
Compliance	1	14	93.3
Overall	-	-	91.3

Another method of evaluation focuses on the precision of forecasts. The *Cut Value* for Table 3 is 0.5; that is, all cases which have been predicted to have a value greater than 0.5 (to 1) are classified as compliers and all those with the predicted value of less than 0.5 (to 0) are regarded as non-compliers. The more these two groups are away from the mid-point and cluster at their respective ends the higher is the precision of the estimated model. Figure 1 reveals a high precision for the estimated model. All correctly predicted compliers have a probability between 0.8 to 1 while the probability of the non-compliers complying falls between 0 to 0.3 range with concentration between 0 and 0.1.

Figure 1. Histogram of predicted probabilities



7. Conclusions

This paper has estimated a logit regression model in an attempt to identify empirically the factors that increase the likelihood of programme countries complying with the policy conditions set out in adjustment programmes. The results suggest that compliance is affected by the seriousness of the economic crisis facing the country and,

therefore, the harshness of the required adjustment. A favourable external environment as well as good economic performance are both important determinants. Compliance is also made more likely by an investment recovery, which reflects appropriate political conditions such as a good degree of political stability and credibility of the reform programme. A low level of development makes compliance harder. This may be due to limited infrastructure, difficulty in implementing strong corrections of policy instruments or limited technical and administrative capacity to implement the reforms. Finally, larger financial support increases the cost of not complying.

In the data set, about one-third of programmes supported by the World Bank were not implemented. To put it in another way, over \$4.3 billion were not put to the use they were intended for. Can the World Bank do anything to increase the chances that programme countries will comply with the policy conditions? In this respect, the paper has a number of important policy implications.

The empirical result that a rise in the investment ratio increases the likelihood of compliance highlights the importance of the political and institutional environment. In this respect, there seems to be some support for the view that development agencies should have a deeper understanding of the political economy of different countries so as to transfer their resources towards countries that are more politically stable.

A recovery of investment also requires that the private sector be persuaded of policy makers' commitment to reform and sustainability of the reform programme. However, on its own, the prescription that reforms should be credible and believed to be sustainable is rather hollow since the credibility and sustainability of reforms is endogenous: the design of adjustment programmes is thus at least as important as the identification of politically stable countries.

With respect to programme design, the paper suggests three aspects where this

could be improved. One concerns the speed and the extent of reforms. The finding that compliance is less likely when the required adjustment is larger could reflect the fact that structural adjustment programmes may envisage a speed of reform that is too fast and/or a range of reforms that is too broad.

Some policy implications of this empirical finding are, however, ambiguous without further research. One interpretation of the evidence is that, under certain circumstances - essentially when the disequilibrium is very large - reforms should be more gradual, for example because the supply response tends to be slow (Noorbakhsh and Paloni (1998b)). Another view is that, in those conditions, reforms should be less ambitious in scope but not less radical: this is the *narrow-but-deep* approach to policy reforms formulated by Rodrik (1990). Whatever the merits of these positions, the empirical evidence seems to indicate that the *big bang* approach to reforms will only make compliance less likely.

A second implication for the design of programmes derives from the result that good economic performance makes compliance more likely. This seems to suggest that reform programmes should pay more attention to economic growth even within a short horizon so that adjustment is no longer associated with protracted stagnation.

The third aspect where the design of programmes could be improved is suggested by the finding that low income countries are less likely to comply. Modifications to the programmes to account for a broader role of government in these societies and special arrangements to reduce the hardship in adjustment programmes should be introduced. The focus on the social dimensions of adjustment and the problem of poverty reduction in the programmes supported since the late 1980s may be seen as addressing this particular concern. The extent to which these more recent programmes have been successful in improving compliance remains to be seen.

The final policy implication is a consequence of the empirical result that the size of financial support affects the likelihood of compliance. It may be argued that, in difficult situations, once the characteristics of a certain country are evaluated favourably and a reform programme is deemed as likely to be agreed with the country, the financial support provided by the World Bank should be generous. A mean package in a crisis situation is unlikely to stimulate the response needed for the success of reforms.

These are important policy implications that deserve further investigation to evaluate their robustness. Moreover, although they draw support from the empirical analysis conducted in this paper, the econometric results should be interpreted with caution. The limited number of observations implies that the estimation results are not very robust to alternative specifications, although from our trials the importance of many of the dimensions identified in this paper was confirmed.

An objective of this paper was to draw attention to the importance of identifying the factors that make countries more likely to comply with conditionality since this may have implications for the design and management of policy-based lending. Although the empirical results are sensible and encouraging, in the absence of previous work on this topic, they must be considered as preliminary. The research agenda is long.

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APPENDIX A

Country typology

Compliers

Benin*, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea*, Guinea-Bissau*, Madagascar, Malawi, Mali, Mauritania, Mauritius*, Mozambique*, Niger, Senegal, Sierra Leone, Tanzania*, Togo, Uganda, Zambia, Zimbabwe.

Non-compliers

Burundi, Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea*, Gabon, Kenya*, Nigeria, Rwanda, Sao Tome*, Somalia*, Sudan*, Zaire*.

Countries with an asterisk are not in the regression sample only due to lack of data.

APPENDIX B.

Adjustment periods

	Pre-Adj.	Adj.		Pre-Adj.	Adj.
Benin	1984-88	1989-93	Mauritania	1981-85	1986-90
Burkina Faso	1986-90	1991-95	Mauritius	1976-80	1981-85
Burundi	1981-85	1986-90	Mozambique	1983-87	1988-92
Cameroon	1984-88	1989-93	Niger	1981-85	1986-90
CAR	1982-86	1987-91	Nigeria	1982-86	1987-91
Chad	1984-88	1989-93	Rwanda	1986-90	1991-95
Congo	1983-87	1988-92	Sao Tome	1982-86	1987-91
Cote d'Ivoire	1977-81	1982-86	Senegal	1981-85	1986-90
Equat. Guinea	1981-85	1986-90	Sierra Leone	1987-91	1992-96
Gabon	1983-87	1988-92	Somalia	1981-85	1986-90
Gambia	1982-86	1987-91	Sudan	1975-79	1980-84
Ghana	1978-82	1983-87	Tanzania	1982-86	1987-91
Guinea	1981-85	1986-90	Togo	1978-82	1983-87
Guinea-Bissau	1980-84	1985-89	Uganda	1983-87	1988-92
Kenya	1975-79	1980-84	Zaire	1981-85	1986-90
Madagascar	1980-84	1985-89	Zambia	1986-90	1991-95
Malawi	1976-80	1981-85	Zimbabwe	1987-91	1992-96
Mali	1983-87	1988-92			

Notes

¹ This was the procedure followed in World Bank (1988) which was the first evaluation report on its adjustment lending operations.

² EIAL stands for Early Intensive Adjustment Lending countries. To be precise, EIAL countries were those that received two or more structural adjustment loans (SALs) or three or more adjustment loans (SALs or sectoral adjustment loans (SECALs)) starting in 1985 or before. See World Bank (1990).

³ At least some of these criticisms are common to those raised towards the index of macroeconomic adjustment presented in World Bank (1994). See Mosley, Subasat and Weeks (1995).

⁴ In fact, in studies of the decision to participate in World Bank or IMF programmes, both logit and probit models have been employed. However, as pointed out by Maddala (1983, p.23) “because the cumulative normal distribution and the logistic distribution are very close to each other, except at the tails, we are not likely to get very different results using...the logit or the probit methods, unless the samples are very large (so that we have enough observations at the tails)”. Moreover, under certain conditions, the two models are equivalent (see Poirier, 1978).

⁵ McFadden (1974) and (1977), Maddala (1983), Hosmer and Lemeshow (1989) and Cramer (1991) provided various justifications for the use of the logit model in economics.

⁶ Since the derivative of an exponential function is proportional to the value of the function, positive changes in its arguments would increase the value of the function at a constant rate.

⁷ The external shock (as a percentage of GDP) was measured as the sum of real interest rate and terms of trade effects.

⁸ A dummy for African countries was not significant.

⁹ To be fair to the authors, it should be said that the focus of their paper was not on the determinants of programme participation but on the effectiveness of adjustment programmes.

¹⁰ In fact, in studies on the determinants of IMF programme participation where the inflation coefficient is significant, its sign is positive (see Knight and Santaella, 1997; McDonald, 1986).

¹¹ If this interpretation is correct, however, it is not immediately clear why current account deficits and debt burdens were measured as differences between the adjustment and the pre-adjustment period rather than, for instance, as levels in the pre-adjustment period.

¹² This interpretation, however, would suggest that the relevant investment ratio would be that in the pre-programme period rather than that during the programme.

¹³ In this case, however, it seems that the relevant real exchange rate should be that in the pre-programme period.

¹⁴ Strictly speaking the paper by Edwards and Santaella (1993) is slightly different from the others in that it analyses the factors affecting the decision of a country to devalue its currency in the context of IMF programmes.

¹⁵ Conway (1994) tried the ratio of agricultural value added to GDP but was not significant.

¹⁶ The inclusion of policy variables may introduce a possible simultaneity bias. Precisely for this reason Joyce (1992) re-estimated his model without the policy variables previously included.

¹⁷ The use of these two terms does not imply that there is a clear separation between them. For example, if the country is hit by an adverse external shock that reduces its capacity to comply, it is possible that its willingness to comply may also diminish. Likewise, a deterioration in the country's economic performance may reduce its willingness as well its capacity to comply. These considerations suggest that terms such as willingness and capacity should be interpreted flexibly.

¹⁸ However, as pointed out by Rodrik (1996), the proposition that crisis ‘causes’ reform has a strong element of tautology and is virtually non-falsifiable.

¹⁹ This could be due, among other factors, to the fact that structural adjustment loans include normally a large numbers of policy conditions (Toye, 1994).

²⁰ The formulation of policy conditions is generally not explicitly contingent.

²¹ The way the risk of simultaneity bias is reduced in studies using a similar methodological approach is by lagging the explanatory variable. In this paper, however, in the absence of a time series for the dependent variable, lagging the rate of growth of GDP would have meant to use the rate of growth of GDP during the pre-programme period. This would not have captured the dimension that should be modelled, that is that compliance is easier when the economy is doing well. It should also be noted that the problem of simultaneity exists only if compliance has an immediate, rather than lagged, effect on growth.

²² The Wald Statistic for a variable with a single degree of freedom is computed as $(\hat{\mathbf{b}}_k / \hat{\mathbf{S}}_{\mathbf{b}_k})^2$ which has a \mathbf{C}^2 distribution.

²³ The mathematical interpretation of the constant is straightforward: if the constant is not significantly different from zero and all explanatory variables are equal to zero, the odds ratio equals 1, that is a 50:50 chance in favour of compliance (or no compliance). It should be noted that a parameter or the constant being equal to zero means that there is no effect on the log of odds because the exponential of zero is equal to unity. To see this note that:

$$Z = \mathbf{b}_0 + \mathbf{b}_1 X_1 + \mathbf{b}_2 X_2 + \dots + \mathbf{b}_k X_k$$

The odds from equation (5) can then be written as:

$$e^Z = e^{\mathbf{b}_0 + \mathbf{b}_1 X_1 + \mathbf{b}_2 X_2 + \dots + \mathbf{b}_k X_k} = e^{\mathbf{b}_0} e^{\mathbf{b}_1 X_1} e^{\mathbf{b}_2 X_2} \dots e^{\mathbf{b}_k X_k}$$

which indicates that the effect of each exponential is multiplicative.

²⁴ The factor of change in odds is given by the exponential of $\hat{\mathbf{b}}_k$.

²⁵ The figures in Column (2) have been obtained through the following steps. First, by using the exponential of $\hat{\mathbf{b}}_k$ one can calculate the odds in favour of compliance resulting from a unit change in the explanatory variables. Second, the associated probability of compliance are calculated from these odds and compared with the probability of compliance for a low income country when all explanatory variables are at their mean values. Of course, the calculation of the factor of change in probability of compliance for a country that changes its status from middle to low income while everything stays constant has taken as the initial level of probability that of a middle income country.

²⁶ The elasticity of odds in favour of compliance with respect to changes in any of the explanatory variables x_k is:

$$\frac{\frac{\partial e^z}{\partial x_k} \cdot \overline{x_k}}{e^z} = \hat{\mathbf{b}}_k \overline{x_k}$$

²⁷ Since $P(\cdot) = \frac{e^z}{1 + e^z}$ the elasticity of the probability of compliance with respect to changes in any of the explanatory variables x_k is:

$$\frac{\frac{\partial P(\cdot)}{\partial x_k} \cdot \overline{x_k}}{P(\cdot)} = \frac{\hat{\mathbf{b}}_k \overline{x_k}}{1 + e^z}$$

The calculations reported in Column (4) assume that the odds in favour of compliance (e^z) appearing in the formula are those of a low income country where the explanatory variables are at their mean value.

²⁸ The concept of elasticity is not meaningful for dichotomous 0-1 variables: the elasticities of odds and probability of compliance have thus not been calculated for the low income dummy.

²⁹ The likelihood ratio test statistic, which has a \mathbf{C}^2 distribution, is equal to 19.49 and significant at 1% level (the critical value for 7 degree of freedom at 1% level of significance is 18.47). The model's \mathbf{C}^2 test is comparable to the F test for regression. The likelihood ratio is the difference between -2LL (-2 times log of likelihood) for the base line restricted model (the model with only a constant) and -2LL for the model including all the explanatory variables. The degrees of freedom are determined by the difference in the number of parameters to be estimated in these models.

³⁰ Knight and Santaella (1997) argue that this measure is analogous to \mathbf{R}^2 in regression.