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# EVALUATING THE EFFECTIVENESS OF STRUCTURAL ADJUSTMENT POLICIES ON MACROECONOMIC PERFORMANCE: A Review of the Evidence with Special Reference to Pakistan

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This paper looks at the impact of structural adjustment on the macroeconomic performance of Pakistan. After a brief description of the broad characteristics of the various policies implemented under Pakistan's 1980s adjustment programme, it provides a methodological review of pre-existing studies of the effects of adjustment on macroeconomic performance in Pakistan. A number of methodological shortcomings of the methods used are identified, including the problem of controlling for non-adjustment factors. An alternative analysis is then proposed, which involves simulating an error correction model using time series data for inflation and investment. Model simulations based on a number of alternative scenarios suggest that adjustment has had a negligible indirect effect, if any, on investment. Inflation would on average have been higher in the absence of adjustment, though this difference has diminished in recent years.

## I. Introduction

Pakistan has received over three billion U.S. dollars in IMF and World Bank adjustment lending since 1980 [Iqbal,(1993), Khan, (1994)]. Based on the number of adjustment loans it has received, Pakistan is classified as an "intensive adjuster" by the World Bank [World Bank, (1992)]. These loans have been contingent on a number of policy reforms, including: reducing the overall budget deficit; curtailing

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the rate of price inflation; reducing the current account deficit; reducing the private external debt service ratio; increasing gross official reserves; containing growth of domestic credit; liberalising foreign trade; rationalising public investment; reforming the financial sector, and ; deregulating agricultural sector prices [Zaidi, (1993), and McGillivray and White, (1994)]. The main aims of these reforms have been to control price inflation and increase economic growth.

Adjustment lending to Pakistan has been the subject of much debate. Paradoxically, this largely relates to Pakistan's significantly improved macroeconomic performance in the 1980s and early 1990s. McCleary (1991), for example, argues that the IMF World Bank, through their regimes of policy-based lending, have played a positive role in the development of the Pakistan economy during the 1980s. Khan (1991), however, argues that reforms introduced during the 1980s were marginal and not much greater than those introduced in the preceding decade. This is consistent with the findings of McGillivray and White (1994), who show that the majority of the Pakistan's adjustment programme policy objectives have not been attained. Zaidi (1993, 1994) goes even further. He argues that much of Pakistan's improved macroeconomic performance has occurred regardless of adjustment lending – that its progress is due to Pakistan's "own genius".

This paper attempts to shed more light on the issue of adjustment and macroeconomic performance. Is Pakistan's improved performance due to the introduction of IMF and World Bank supported structural adjustment programme and, if so, to what extent? The basic premise of this paper is that we currently do not know the answer to this question: much more rigorous and objective research is required. While by no means definitive, we believe that the sort of analysis provided in this paper is a step in the right direction. The paper commences, in Section II by reviewing previous studies on the effects of structural adjustment on Pakistan's macroeconomic performance. Special attention is given to the methods these studies adopt. A number of methodological shortcomings are identified, so too are contradictions between the findings of various studies. Section III contains this paper's own analysis of the experience of adjustment in Pakistan. It is based on the estimation and simulation of an error correction model estimated using time series data for the period 1960-92. This model is augmented with intercept and slope dummy variables which test for structural breaks due to the introduction of an adjustment programme. Result of this analysis, where they could be drawn, suggest that adjustment has had little casual effect on Pakistan macroeconomic performance *vis-a-vis* investment. In the case of inflation, however, adjustment seems to have had a beneficial impact in that inflation on the average, would have been higher in the 1980s without an adjustment programme.

## II. Evaluating the Effects of Adjustment: Some Methodological Issues

A number of studies on the effects of structural adjustment in Pakistan have been

undertaken. In what follows, we review these studies, paying special attention to the methodologies employed.

### *i) Before and After Comparisons*

The simplest form of analysis is "before and after" comparison. This popular approach involves comparison of the value of a variable before and after the occurrence of some event (in this case the implementation of an adjustment programme). Iqbal (1993) provides a recent application of this analysis to Pakistan data. A selection of Iqbal's results are shown in Table 1.

**TABLE 1**

Before and After Comparison of Pakistan's Macroeconomic Performance – Selected Indicators

| Indicator | 1970-79[a] | 1980-91[a] |
|---|---|---|
| Real GDP Growth (%) | 4.4 | 6.3 |
| Investment (% of GDP) | 15.1 | 17.0 |
| Current Account (% of GDP) | -5.9 | -4.2 |
| CPI Inflation (%) | 12.7 | 7.9 |
| Exports (% of GDP) | 8.0 | 10.4 |
| Budget Balance (% of GDP) | -5.2 | -7.7 |
| Terms of Trade Change (%) | -1.7 | -4.3 |

[a] Annual average for period under consideration.

Source: Iqbal (1993) and based on IMF (1992) and Government of Pakistan (1985, 1992).

Table 1 certainly paints a generally glowing picture of structural adjustment in Pakistan with each indicator but one showing clear improvements. In particular, real GDP growth in the adjustment period is strong in comparison to the pre-adjustment period. The dangers of such comparison are reasonably obvious and well known. In particular, they make no allowance for other factors that influence the variables under consideration. One can attribute these improvements to the adjustment programmes only if it can be shown that all other relevant variables remained unchanged between the two periods. Indeed, this assumption of *ceteris paribus* is implicitly adopted through the use of the before and after approach. Unless this can

be shown, which appears quite unlikely, one simply ought not to ascribe causation to these programmes.[1]

### *ii) Comparator Country Analysis*

Another popular method of assessing the macroeconomic impact of adjustment programmes is the "comparator (control group) country" approach. The use of this approach is often intended to overcome the *ceteris paribus* problem of the before and after approach by comparing the experience of adjusting and non-adjusting countries over the same period. But this approach itself crucially rests on a rather different *ceteris paribus* assumption: all included countries are differentiated only in terms of having, or not having, an adjustment programme. More specifically, this approach requires each country to have experienced the same external environment over the period of analysis and share the same basic economic structure. Moreover, if we accept that current macroeconomic performance is a function of past performance, it also requires that each country exhibit highly similar performance in the pre-adjustment period.[2] Satisfying each of these requirements in practice would seem a difficult and necessarily problematic task. The data in Table 2 highlight these problems.

Table 2 shows various performance indicators for Egypt and Pakistan. These countries were paired in a comparator country analysis reported in the influential Mosley et al. (1991) study. Some rather mixed signals emerge from Table 2. Some contradict conclusions drawn from Table 1's before and after analysis (those relating to investment and export).[3] On the basis of the data for 1980-92, we could conclude that adjustment has on balance served Pakistan well, since it out-performs Egypt in five of the seven indicators. But even in 1970-79, Egypt's performance was inferior to that of Pakistan on account of two of these indicators (current account and government budget balance). Moreover, in as much as GNP per capita is an appropriate indicator, both countries would appear to have different economic structures. Together with the often vast differences in pre-adjustment performance,

[1] The importance of this can easily be demonstrated in the Pakistani case. As outlined in Naqvi and Sarmad (1993), Pakistan during the 1980s received huge remittances from nationals employed abroad, increasing these flows well above the level experienced in the pre-adjustment period. This event, which is totally unrelated to adjustment, itself played an important role in the improved current account balance.

[2] See Goldstein and Montiel (1986) for further details of this argument with respect to IMF stabilisation programs. In short, they argue that countries adopting a stabilisation program are likely to exhibit poorer performance than those which do not adopt such a program.

[3] We are blatantly aware of the discrepancies between the data in Tables 1 and 2. There are of course many reasons why this may emerge (including the use of different sources), but it does not especially matter for our current purpose of evaluating methodologies. That is, the methodological issues arise even if the data are fully consistent.

TABLE 2

Selected Macroeconomic Indicators, Pakistan and Egypt

| | 1980-92 | | 1970-79 | |
|---|---|---|---|---|
| Indicator | Pakistan | Egypt | Pakistan | Egypt |
| Real GDP Growth (%) | 6.16 | 3.76 | 4.10 | 7.76 |
| Investment (% GDP) | 18.85 | 23.26 | 16.04 | 23.05 |
| Current Account (% GDP) | –3.79 | –6.52 | –5.75 | –10.15 |
| CPI Inflation (%) | 7.34 | 17.78 | 12.47 | 8.23 |
| Exports (% GDP) | 13.57 | 24.49 | 10.10 | 19.22 |
| Govt. Budget Balance (% GDP) | –6.67 | –9.96 | –8.19 | –16.53 |
| Terms of Trade Change (%)[a] | –2.00[a] | –4.60[a] | –5.60[b] | –2.90[b] |
| GNP Per Capita ($US) (1981) | 350.00 | 650.00 | | |

All percentages refer to yearly averages for period under consideration.
[a] Refers to 1981-86 [b] Refers to 1975-81.
Sources: Mosley et al., (1991), as supplemented by data from World Bank (1994).

this would clearly suggest that any pairing of Egypt and Pakistan for a comparator country analysis of the effects of adjustment is, at best, dubious.[4, 5]

### *iii) Regression Analysis (Econometric Modelling)*

The remaining method used to assess the macroeconomic impact of adjustment is that which dominates applied economic research: econometric modelling of time series data using multiple regression techniques. Although often abused, this tech-

[4] Note that Pakistan seems to have converted relatively poor pre-adjustment performance (in inflation, GDP growth and the government budget) to relatively superior performance. That is, it now outperforms Egypt in each of these respects, whereas the reverse was the case in 1970s. On this basis it could be argued that adjustment, with respect to these indicators, has served Pakistan rather well. However, our main point on this issue remains: these economies would appear to be so different that any comparison in this context is necessarily problematic.

[5] Balassa (1989) uses a blend of the before and after and control group approaches, by comparing changes in performance of adjusters and non-adjusters. No attempt is made to match the control group for prior

nique is potentially advantageous in that it can avoid the main problems associated with the before and after and comparator country approaches. That is, if a comprehensively specified model is used (i.e. which contains all important determinants of the performance indicator under consideration) it avoids the *ceteris paribus* problem. Moreover, if applied to time series data for individual country case studies, it avoids the difficulties inherent in pairing countries for comparator country analysis.

A recent econometric study of adjustment in Pakistan is Iqbal (1993). Iqbal estimated six equations using time series data. The dependent variables were: real GDP growth, investment, exports, import demand, government current consumption and domestic inflation. The level of adjustment lending appeared as an explanatory variable in each equation, along with a range of common macroeconomic variables. In the case of the GDP growth and investment, for example, Iqbal estimated the following equations:

$$GDPg = \alpha_0 + \alpha_1 \left[\frac{ALs}{Y}\right]_{t-1} + \alpha_2 \left[\frac{OL}{Y}\right]_{t-1} + \alpha_3 RDSg_{t-1} + \alpha_4 \Delta TOT_{t-1} + \alpha_5 WI + e \quad \text{and} \tag{1}$$

$$\frac{I}{Y} = \beta_0 + \beta_1 \left[\frac{ALs}{Y}\right]_{t-1} + \beta_2 \left[\frac{OL}{Y}\right]_{t-1} + \beta_3 DSg + \beta_4 IR + \beta_5 P^e + u \tag{2}$$

where GDPg is real annual GDP growth, Y is GDP, ALs is the level of adjustment lending (structural plus adjustment) provided by the World Bank, OL is other external borrowing, RDSg is real annual domestic savings growth, ΔTOT is the annual change in the terms of trade, I is the investment (i.e., gross domestic capital formation), DSg is nominal savings growth, IR is average nominal interest rate on fixed deposits, $P^e$ is the expected rate of inflation, e and u are error terms and t refers to the time period.

Iqbal estimated his six equation model using annual data for 1979-91. For our purposes, the most pertinent results are those showing the effect of adjustment loans on each performance indicator (as shown, for growth and investment, by $\alpha_1$ and $\beta_1$ in equations, (1) and (2)). The results are rather striking. In equation (1), $\alpha_1$ was found to be significantly different from zero and to display a *negative* sign: adjustment loans, it seems, retard growth. In contrast, $\beta_1$, while significantly

characteristics or experience of external shocks in the 1980s. Balassa found that Pakistan "showed a much superior performance to the comparator group" (p.90), with improvements in such indicators as output growth, exports, the balance of payments and the rate of inflation. Sarmad (1992) used a decomposition methodology to look at external shocks and adjustment in Pakistan, looking mainly at the balance of payments.

different from zero, displayed a positive sign. With the exception of exports, the equivalent parameters in the remaining equations were also found to be significantly different from zero (albeit at the 20 per cent level in two of the three instances). But the direction of causation was not uniform. While reducing import demand, adjustment loans seemed to increase government consumption and domestic inflation.

A number of comments can be made about Iqbal's analysis (and very similar analysis for other countries – see, in particular, Mosley et al. (1991)). The most fundamental is that no account is taken for a possible change in domestic economic policy associated with adjustment. That is, the adjustment variable in this analysis is the level of loans only and the more important policy reforms are ignored. To this extent, only a very partial analysis of adjustment is provided. Other comments relate to the number of time series observations used in estimation. As Iqbal plainly and correctly notes, 12 years of data is too small a sample to enable one to reliably infer conclusions from multivariate regression analysis. This problem is unavoidable: it cannot be solved by simply obtaining more data since adjustment loans only came into being a little over a decade ago. In addition, the equations estimated are likely to be a set of simultaneous equations. Iqbal's use of the ordinary least squares (OLS) method of estimation (made necessary by the small sample size) is invalid in this event.[6]

## III. Structural Adjustment and Macroeconomic Performance in Pakistan

### *a) Methodology*

Given the perceived methodological shortcomings of the studies discussed in the previous section, our task now turns to devising a method which avoids the above pitfalls. The question addressed is whether the presence of a programme structurally transforms an economy (or sector within it) to such an extent that significant improvements in macroeconomic performance result. This question must primarily turn on whether such a programme results in changes in the underlying behavioural relationships that determine macroeconomic performance. How do we test for this while avoiding the pitfalls of previous approaches? Our preference is for econometric modelling principally on the grounds identified above: it can control for the effects of non-adjustment factors. But precisely how should such an exercise be conducted?

One possible approach is the econometric procedure proposed by Sapsford and Greenway (1994) in their study of the effects of trade liberalisation on economic growth. They identified two possible effects, both of which are of direct relevance

[6] Iqbal's analysis falls within the general literature on the macroeconomic impact of aid. Many other criticisms of this literature also apply to Iqbal. See White (1992, 1994) for surveys of this literature.

to an adjustment programme (which typically contains a trade liberalisation). The first is reasonably direct: the introduction of a programme may exogenously alter a determinant of the performance indicator under consideration. For example, a financial liberalisation may see a fall in interest rates and this should, according to standard economic behavioural relationships, see an increase in investment. The second effect is at the very heart of the theory of adjustment. The process of adjustment is, through the reduction of structural rigidities, supposed to change the nature of behavioural relationships between variables. This translates to altering the sensitivity of an indicator to changes in one or more of its determinants. For convenience, we shall refer to these impacts as the *size* and *sensitivity* effects of adjustment.

The impact of the size and sensitivity effects on growth can be modelled in a reasonably straightforward manner by including intercept and slope dummy variables in the specification of an econometric model. Ideally, this model ought be a fully specified structural macroeconomic model so that all linkages between variables, exogenous and endogenous, can be determined. But this approach has two limitations. First, the data requirements of such a model are great, often requiring 40 or more time series observations. Such data are simply not available for the Pakistani economy. Second, it is now well known that most economic time series are non-stationary and regressing two non-stationary variables often results in spurious results. Means of accommodating this problem are not readily available within simultaneous, multi-equation econometric models. These problems lead us to an alternative modelling approach, one which is widely used in applied econometric research. Provided the variables used are cointegrated we may estimate an error correction model (ECM), which combines the long-run equilibrium with short-run dynamics.

The basic ECM is:

$$\Delta y_t = \alpha + \beta' \Delta x_t + \gamma (y_{t-1} - \delta' x_{t-1}) + \mu_t \qquad (3)$$

where $y_t$ is a macroeconomic performance indicator in period t, $\Delta x_t$ is a vector of exogenous regressors expressed in first difference form, $y_{t-1}$ and $x_{t-1}$ are lagged own values (the latter in levels), $\alpha$ is an intercept term, $\gamma$ is a parameter, $\beta'$ and $\delta'$ are vectors of parameters and $\mu_t$ is an error term. The final expression in brackets is the error correction term, which captures the long-run relationship between y and x This can be seen by solving for equilibrium (setting $x_t = x_{t-1} = x^*$):

$$x^* = \frac{1}{\delta} \left( \frac{\alpha}{\gamma} + y^* \right) \qquad (4)$$

In case $\beta_0 = 0$, there is a long-run proportional relationship between x and y. The size effect can be captured by adding a binary (0,1) dummy variable to $\alpha$. This

variable takes the value of 1 for the adjustment period and 0 for the non-adjustment period and can be lagged one or more periods to capture the full effect of a programme. The sensitivity effect can be captured by adding such a variable to $\delta$, $\beta_1$ and $\gamma$.

Let us for the moment assume, merely for presentational convenience, that the sensitivity operates via $y_{t-1}$ only. The augmented ECM therefore becomes:

$$\Delta y_t = \alpha + \beta'\Delta x_t + \gamma(y_{t-1} - \delta' x_{t-1}) + \lambda D_{1,t-j} + \pi D_{2,t-k}\, y_{t-1} + \mu_t \qquad (5)$$

where $D_{1,t-j}$ and $D_{2,t-k}$ are binary dummies picking up size and sensitivity effects, respectively, and j and k are equal to or greater than zero. Given the above comments, they act as intercept and slope dummies, respectively. these effects will be larger the greater the absolutes values of $\lambda$ and $\pi$. It follows that during the adjustment period, when $D_{1,t-j} = D_{2,t-k} = 1$, (5) becomes

$$\Delta y_t = (\alpha + \lambda) + \beta'\Delta x_t + (\gamma + \pi) y_{t-1} - \gamma\delta' x_{t-1} + \mu_t \qquad (5a)$$

and reduces back to (3) in the pre-adjustment period (that is, when $D_{1,t-j} = D_{2,t-k} = 0$).

Some further comments on equations (3) to 5(a) are in order. First, the estimating equation (5a) is parsimonious, provided that the number of variables in the vectors $\Delta x$ and x is limited to a workable quantity. A method of dealing with this is provided below. This is useful if one is forced to use relatively small samples. Second, the effect of introducing a programme does not have to be contemporaneously modelled. The lags assigned to the dummy variables can vary from zero upward. The full effects of a programme may not be evident until some years after its introduction. Experimentation with alternative values of j and k should be able to detect this. Third, and importantly, the main focus is on the qualitative change in policies associated with the introduction of a programme. While possible effects directly associated with the receipt of additional loans is not captured directly, they are likely to indirectly influence the size of $\lambda$ and $\pi$. Finally, there is a "black box" element in this approach. That is, its weakness is that the use of dummies does not show the specific processes by which adjustment may affect performance. These variables and their coefficients simply show whether adjustment has worked (or not worked), not how it has worked.

### b) *Application*

The preceding methodology was applied to time series data for Pakistan. The following common indicators of macroeconomic performance were examined: annual real GDP growth, share of investment in GDP, the domestic savings to GDP ratio,the export to GDP ratio and the annual CPI inflation rate. All data were taken

from World Bank (1978-94).

Our initial objective turns to finding the most parsimonious model consistent with the data for each indicator. We followed the Hendry general to specific modelling approach. This involved three stages. First, a comprehensively specified model estimated, with each variable eliminated in turn so that various restrictions could be tested using F ratios. Second, various lag structures were tested for variables retained in the model. Third, having determined the best fitting lag structures, further restrictions were tested to obtain the most parsimonious regression model. Having found this model, we then tested for cointegration. If this was not the case, then the regression, however high its explanatory power may have seemed, was judged to be spurious.

Unfortunately, a result of the preceding procedure was that we were unable to find a robust equation for GDP growth and domestic savings. While the export ratio exhibited a pronounced and strong relationship with both the multilateral real exchange rate and a demand variable (an index of the real GNP of Pakistan's four main trading partners), the regression proved to be spurious, as was the case in all other attempts to find a satisfactory export function.[7]

Our focus therefore narrowed to the investment ratio and the rate of inflation. The investment and inflation equations exhibited particularly good explanatory power, with squared correlation coefficients between actual and fitted values of the explanatory variables of 0.99 and 0.92, respectively. The following equation was finally obtained for investment:

$$\Delta\left(\frac{I}{Y}\right)_t = 0.329 + 0.095\,\Delta\left(\frac{B}{Y}\right)_t - 0.038\,\Delta\,(\Delta CPI)_t - 2.772\,\Delta DI_t$$
$$- 0.019\left[\left(\frac{I}{Y}\right)_t + 0.191\left(\frac{B}{Y}\right)_t - 4.793\,DI_{t-1} - 0.056\,\Delta CPI_{t-1}\right] + \mu$$

where (ignoring subscripts) I is investment, Y is GDP, B is the government budget balance, ΔCPI is the inflation rate and DI is a binary variable taking the value of one during the period 1969-74 (in which investment was especially low) and Zero in all other years. One of the more pertinent features of this equation is that it does not contain size and sensitivity effect dummies.[8] Neither was found to significantly effect investment, even after allowing for a range of lags, and as such were eliminated from the equation. We obtained the following equation for inflation:

$$\Delta(\Delta CPI)_t = 0.848 + 0.475\Delta\left(\frac{B}{Y}\right)_t + 0.001\,\Delta NER_t + 18.839\,\Delta DC_t$$

[7] Further details of estimation can be obtained from the authors.

[8] These dummies were assigned a value of one for all years from 1980 and zero for all others.

$$+ 0.936\ \Delta D_{1,\,t-6} - 1.225\Delta\left\{\left(\frac{B}{Y}\right)_t D_{2,\,t-4}\right\} - 1.38\ \left[\Delta CPI_{t-1} - 2.19\right.$$

$$- 0.001\left(\frac{B}{Y}\right)_t - 14.973\ DC_{t-1} - \quad ER_{t-1} - 8.039 D_{1,\,t-5}$$

$$\left. - 1.947\Delta\left\{\left(\frac{B}{Y}\right)_{t-1} D_{2,\,t-5}\right\}\right] + v_t$$

where NER is the nominal rupee-US dollar exchange rate (i.e., the number of rupees required to buy one dollar), DC is a binary variable taking the value of one during the especially high inflation years of 1973-75 and zero otherwise, $D_1$ is the size effect dummy, $D_2$ is the sensitivity effect dummy (in this case via the relationship between inflation and the budget deficit) and all other variables are as before. The lags attached to $D_1$ and $D_2$ imply that adjustment had not taken full effect on inflation until 1983. A surprising, yet highly robust result is that negative coefficients attached to budget deficit to GDP ratio (B/Y ). It therefore seems that a deterioration of the budget balance is associated with a lessening of inflation and *vice versa*.[9] Indeed, based on the finding of a positive sensitivity effect on inflation, this relationship is stronger under adjustment.[10]

### c) *Some Further Analysis*

The usefulness of econometric analysis is that it tells us whether an adjustment programme has influenced performance and the direction of influence after controlling for the effects of other extraneous factors. But looking at estimated coefficients alone says little of final outcomes. In other words, it does not give a clue of what performance would be like without adjustment. Is inflation lower and investment higher due to adjustment, or is it the reverse? More specifically, to what extent is Pakistan's improved performance due to adjustment? Having said this, it is possible to use a fitted econometric model for *ex post* simulations and this sort of analysis is capable of saying something about the outcomes. It is this type of simulation, using the results reported in the preceding sub-section, to which our attention now turns.

*Ex post* simulation analysis requires us to speculate what values of those variables determining investment and inflation would assume in the absence of adjustment. Stated differently, what scenarios would have prevailed without adjustment? We settled on the following : Scenario 1 – no size and sensitivity effects and

[9] One can only speculate as to why this may be so. It could be that reductions in the deficit crowd-in private expenditure, which in turn is more inflationary than public expenditure.

[10] One should exercise caution over the interpretation of the size effect dummy. A significant sensitivity effect indicates a pivoting of the fitted regression line. This in turn alters the intercept term, and it may simply be this effect which has driven our results for $D_1$.

the nominal rupee-US dollar exchange rate remains at its 1981 value for 1982 onward;[11] Scenario 2 – no size and sensitivity effects, the post-1981 depreciation (increase) of the nominal rupee-US dollar exchange rate is half the actual rate and the budget deficit from 1980 is 20 per cent higher than was actually the case; Scenario 3 – as in Scenario 2, but with exchange rate remaining at its 1981 value; Scenario 4 – as in Scenario 2, but with no change in the deficit. Of these scenarios, our best guess is that Scenario 2 would have been the most likely if the adjustment programme had not been introduced.

Simulation results are summarised and compared with actual outcomes in Table 3.[12] All data are expressed as period averages. Full simulation results are plotted and compared to actual outcomes in Figure 1 to 8 of the Appendix. Since we are comparing actual to simulated values, the latter include the error terms. The results suggest that adjustment has had only a very slight positive effect on investment. The largest difference between average simulated and actual adjustment period outcomes is only 0.27 percentage points. This arises from Scenario 2. But given the degree of speculation over the adjustment period counterfactual scenarios, the safest conclusion to draw is that adjustment has had no impact. By implication, this also suggests that Pakistan's improved investment performance *vis-a-vis* the immediate pre-adjustment decade is not due to the adoption of World Bank and IMF adjustment programmes. To this extent, the conclusion drawn by Zaidi (1993) – that improved performance is due to Pakistan's own genius – is certainly not wholly rejected by these results.

TABLE 3

Investment and Inflation Rates (Actual and Simulated) - Pakistan

| | Investment (%GDP)[a] | CPI Inflation (%)[a] |
|---|---|---|
| Actual 1980-91 | 18.70 | 7.80 |
| Simulated 1980-91 (Scenario 1) | 18.67 | 9.04 |
| Simulated 1980-91 (Scenario 2) | 18.53 | 10.36 |
| Simulated 1980-91 (Scenario 3) | 18.58 | 9.00 |
| Simulated 1980-91 (Scenario 4) | 18.62 | 10.40 |

[a] period averages

[11] The nominal rupee-US dollar exchange rate depreciated significantly from 1982 onward. In index number terms, it depreciated from 207.9 to 520.0 points between 1981 and 1992.

[12] For all investment simulations were used simulated, rather than actual, values of inflation. This captures the interactive effect which has been ignored in other analyses (see, for example, Faini et al., 1990).

In contrast, inflation clearly seems lower as a result of adjustment. It seems that, at best, inflation would on average be 2.20 percentage points higher without adjustment. This result arises from Scenario 3. Unlike investment, inflation is rather sensitive to the different assumptions on which each Scenario is based. Indeed, in Scenario 4 inflation is 1.4 percentage points higher than in Scenario 1. These differences notwithstanding, the same conclusion is drawn over the effect of adjustment on inflation irrespective of which scenario is chosen. Figures 5 to 8 suggest that adjustment had its greatest impact on inflation in the period 1985 to 1987. According to Scenarios 2 and 4, however, the difference between actual and simulated "no adjustment" scenarios is removed by 1991. Interestingly, despite these generally favourable effects, it would seem that even without such a programme inflation would still be lower than in the 1970s. As Table 3 shows, the average actual inflation rate for this decade, at 12.47 per cent, is still clearly higher than any of the simulated averages for 1980–91. Based in our scenarios, between 3.47 and 2.03 percentage points of the difference between 1970–79 and adjustment period inflation is due to non-adjustment factors. Thus, with respect to inflation, the adjustment programme introduced in 1980 seems to account for the minority of Pakistan's improved adjustment period performance.

## IV. Conclusion

This paper evaluated various methodologies used to assess the impact of World Bank and IMF-sponsored structural adjustment policies on macroeconomic performance using data for Pakistan. After highlighting problems with a number of common approaches, it argued that the more appropriate method was econometric modelling. The main advantage of this approach is the ability to control for the influence of non-adjustment programme factors on macroeconomic performance. The paper then attempted to apply more rigorous, but by no means definitive, econometric modelling techniques to Pakistani data. Results of this analysis, where they could be drawn, suggest that adjustment has had little causal effect on Pakistan macroeconomic performance *vis-a-vis* investment. In the case of inflation, however, adjustment seems to have had a beneficial impact, in that inflation would on average be higher in the 1980s without an adjustment programme.

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## Appendix

**Investment and Inflation Simulation Results**

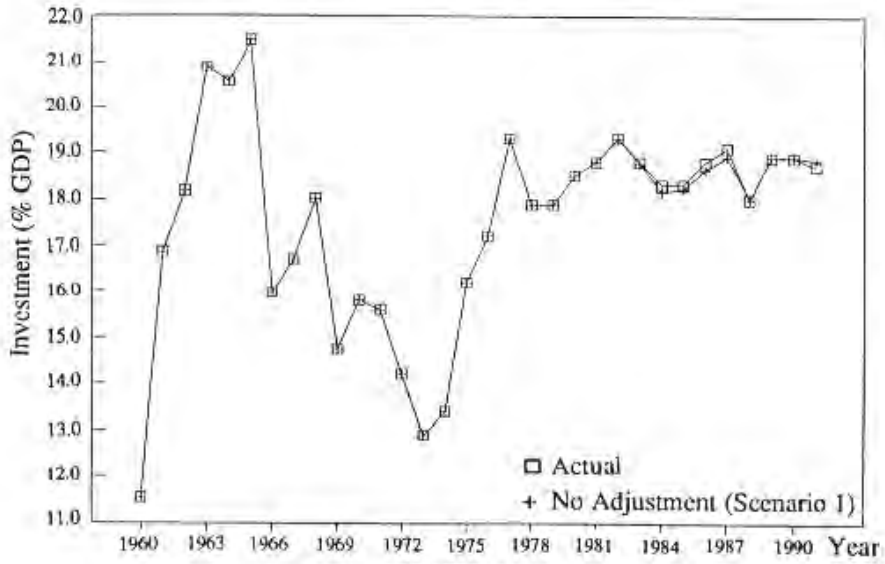


**FIGURE 1**

Investment, Pakistan 1960–91

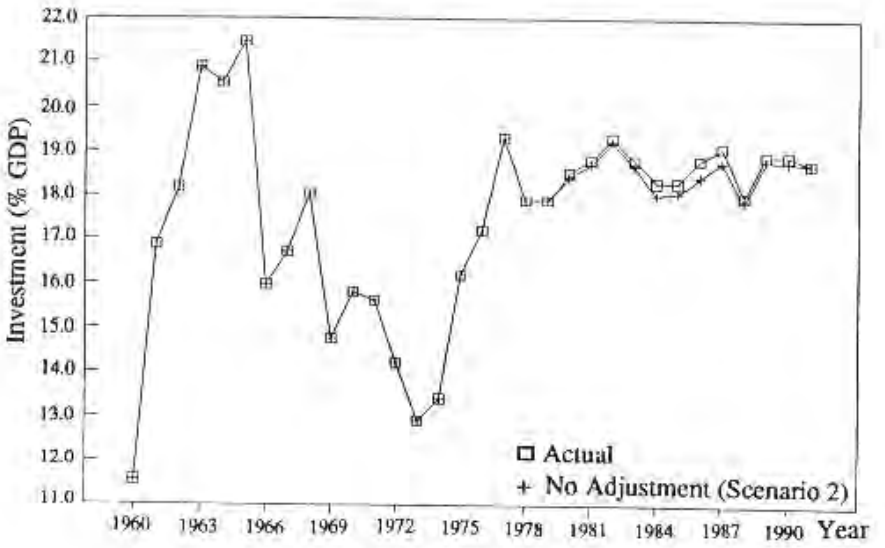


**FIGURE 2**

Investment, Pakistan 1960–91

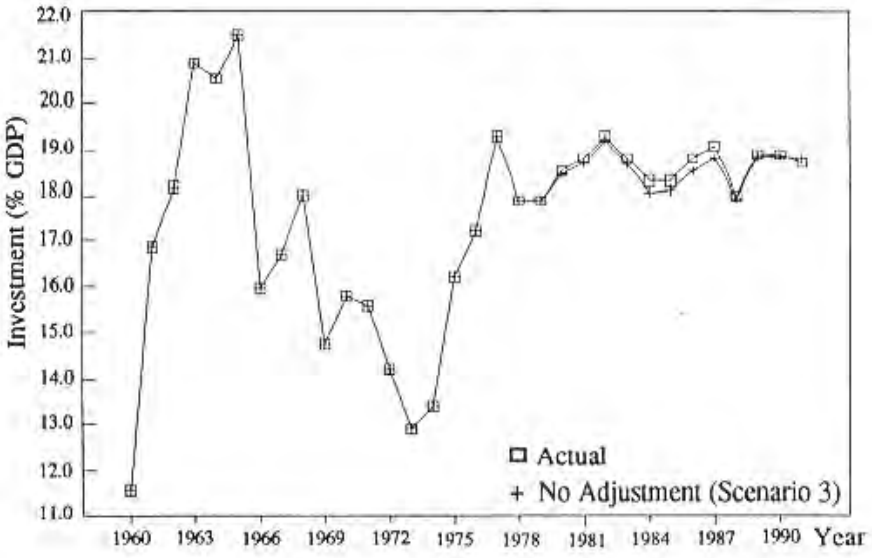


**FIGURE 3**

Investment, Pakistan 1960–91

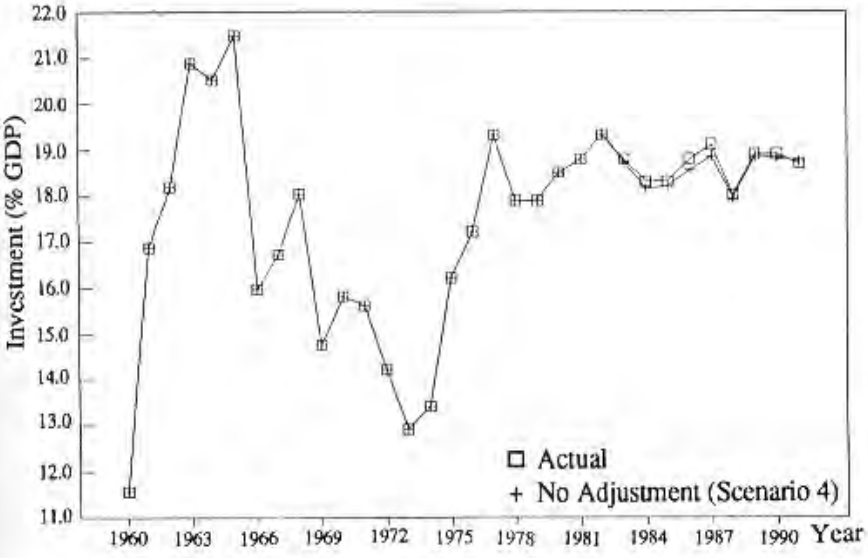


**FIGURE 4**

Investment, Pakistan 1960–91

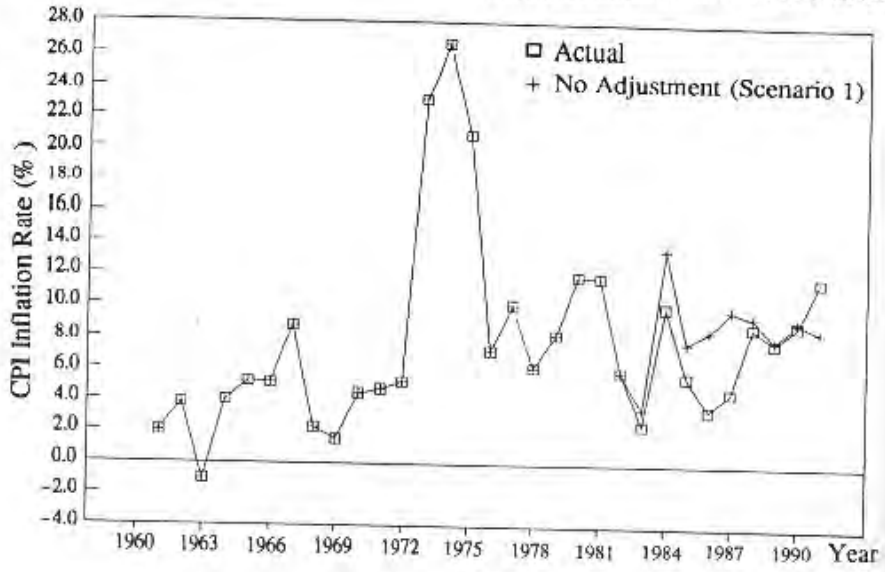


**FIGURE 5**

Inflation, Pakistan 1960–91

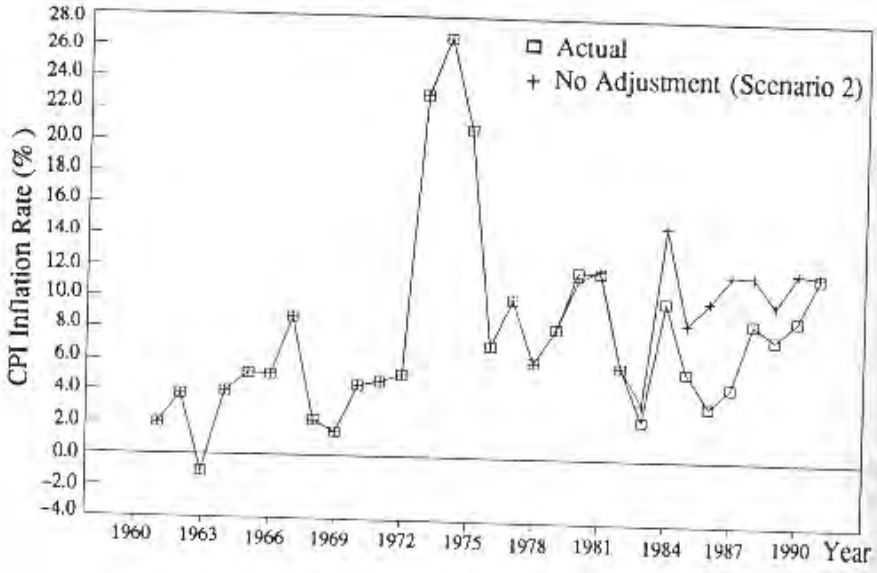


**FIGURE 6**

Inflation, Pakistan 1960–91

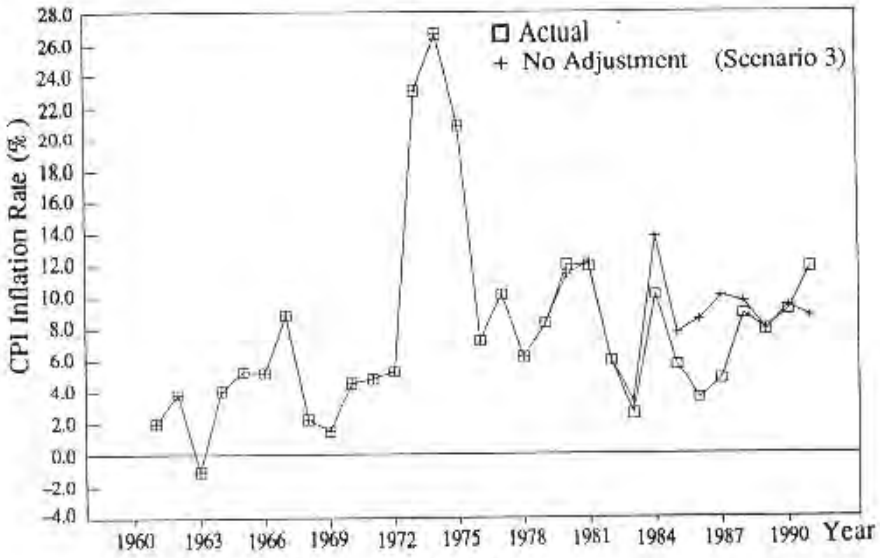


**FIGURE 7**

Inflation, Pakistan 1960–91

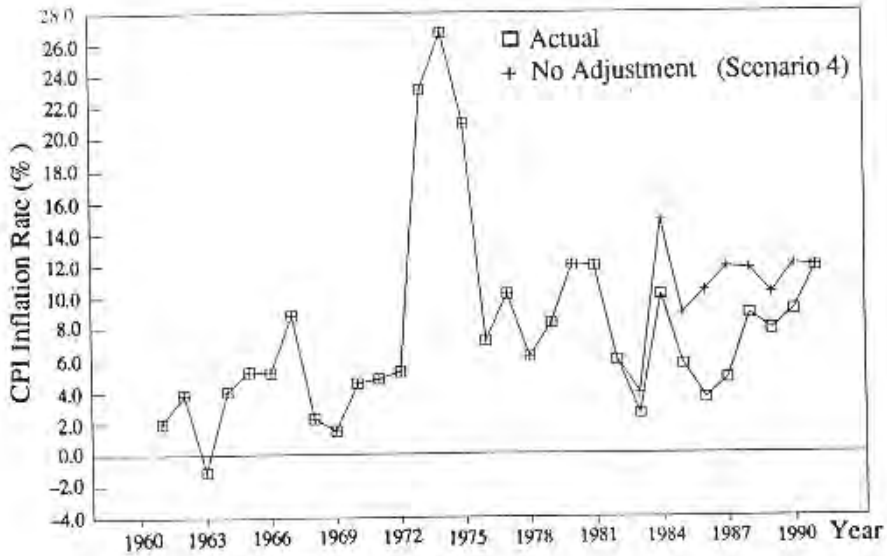


**FIGURE 8**

Inflation, Pakistan 1960–91