Assessing the Effect of Structural Adjustment Programmes on Export Performance in Developing Countries

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Abstract

This paper analyses three aspects of the export supply response to structural adjustment programmes supported by the World Bank. First, have programmes improved programme countries' export performance relative to non-programme countries? Second, have programmes contributed to re-orientation of production and build up of supply capacity? Third, have programmes resulted in greater export diversification? These questions are analysed by employing the 'before-after', 'with-without' and an original extended version of the 'modified control group' approach. The empirical findings in this paper suggest that, although structural adjustment programmes have the expected effects in the short to medium run, they have failed to generate an appropriate supply response which could underpin lasting export expansion and diversification.

1. Introduction

Structural adjustment lending was initiated in 1980 in response to serious balance of payments problems affecting many developing countries. It was initially expected that structural adjustment loans (SALs) to a country would continue for three to five years. In fact, following adverse developments in the international economy in the early 1980s, adjustment lending has intensified rather than disappeared and its scope has widened with the introduction of sectoral adjustment loans (SECALs). The share of SALs and SECALs in World Bank lending has thus steadily increased since and, by the end of the 1980s, structural adjustment lending was accounting for a third of total lending.

The economic difficulties of the 1980s and the debt crisis above all made trade policy reforms a significant component of the structural adjustment efforts undertaken by many developing countries and a prominent feature of the conditionality attached to World Bank lending for structural adjustment. During the second half of the 1980s, 70 per cent of adjustment loans had significant trade policy components and contained trade policy reform conditionality.

The objective of trade policy adjustments is to eliminate the anti-export bias that arises from protectionism. Outward trade orientation is expected to shift incentives towards tradables, especially exportables, lead to a more efficient allocation of resources and rekindle long-term economic growth.

It is important, therefore, to investigate whether World Bank-supported Structural Adjustment Programmes (SAPs) have in practice played any role in improving programme countries' export performance relative to non-programme countries. This question has already been addressed in a cross-country context in a number of studies (see for instance World Bank, 1988, 1990, 1992a; Thomas and

Nash, 1991; Mosley et al. 1991; Kirkpatrick and Clarke, 1992). Generally, these studies have found that SAPs have had a significant but weak effect on export performance. This has often been attributed to the fact that the response of exports to SAPs will only take place with a long lag. It is therefore interesting to investigate whether, a few years after those earlier studies, there is any stronger evidence of programme effects on export performance and whether Early Intensive Adjustment Lending (EIAL) countries, which implemented reforms early on and borrowed from the World Bank more heavily than other countries, have performed better than Other Adjustment Lending (OAL) countries.

Moreover, unlike previous studies, this paper examines also other aspects of the export response. One is whether the export expansion has been accompanied by a re-orientation of production and a build up of export capacity. Another question is whether SAPs have resulted in greater export diversification. In this respect, disturbing evidence from country-studies and small cross-sections shows that the increase in exports has not been backed by a build up of supply capacity and diversification of production. Likewise, no export diversification seems to have taken place to any significant degree (for example, Jenkins, 1996; Shafaeddin, 1994 and Yentürk-Coban, 1992). These are clearly unwelcome findings as they imply that, despite a change in trade orientation, LDC's economies are not more able to withstand adverse external shocks. It is therefore important to investigate whether these findings also emerge in a large cross country study.

These issues are analysed by employing three different methodological approaches, each providing useful information. The three approaches are the 'before-after', the 'with-without' and an original extended version of the 'modified control group' approach. The empirical results, as often in large cross-section studies, are not

conclusive. The interpretation put forward in this paper is that, although policies normally included in SAPs have the expected effects, their impact on exports and capacity are short lived. SAPs seem to have failed to generate an appropriate supply response which could underpin lasting export expansion and diversification.

The plan of this paper is as follows. The methodological approach of the study is discussed in Section 2. The following three sections analyse the three questions of this paper in turn, i.e. export performance, supply capacity and export diversification. Concluding comments are in Section 6

2. Methodology

In order to assess the impact of SAPs on export response we look at the evolution of a number of variables. First, a variable measuring export performance: the rate of growth of real exports. The second variable measures diversification of production. As manufacturing value added in GDP is an indicator of the production base for manufactures, its growth can be taken as an indicator of the increase in supply capacity. An alternative indicator is the rate of growth of GDP, which is also used in empirical work to measure increases in supply capacity.[1] Finally, the ratio of manufactured exports to total merchandise exports is taken as a measure of export diversification.

The purpose of this study requires the use of cross section data. This is at the cost of losing information on the role of country-specific economic structures and the degree of policy implementation.

[1] Although it is a rather indirect proxy for supply capacity, the rate of output growth has been chosen as one of the variables to analyse also on the basis of the consideration that, being an important indicator of economic performance, it has always been used in empirical assessments of SAPs.

Following a categorization used by the World Bank itself in assessment studies of its own adjustment lending operations (World Bank, 1990; 1992b), countries have been classified as Early Intensive Adjustment Lending (EIAL), Other Adjustment Lending (OAL) and No Adjustment Lending (NAL) countries.[2]

In studies using this classification (for example, Corbo and Rojas, 1992) OAL countries are considered as non-programme countries as they have received too few adjustment loans during the period analysed for programmes to show any significant impact. However, these studies are based on data at best only up to 1988. In the present paper it is argued that all lags in responses may have disappeared: OAL countries are therefore considered as programme countries, although the existence of a differential response for EIAL and OAL countries is also tested for.

The analysis looks at the evolution of macroeconomic variables of interest over the period 1981-1995. This has been broken down into five-year sub-periods, 1981-1985, 1986-1990 and 1991-1995. Since the country classification is based on the year 1985 as the dividing line and it was in 1985-1986 that structural adjustment lending began on a large scale, the 1981-1985 sub-period is taken as the base and could be interpreted as the pre-SAL period. This is also justified by the consideration that SAPs will have an impact on the supply of exports only after a long lag; thus, even lending that took place in the base period is not expected to have an effect within the same sub-period. Economic performance in the pre-SAL period is compared both to the entire 1986-1995 SAL period and the 1986-1990 sub-period. Comparison is also made

[2] According to this categorization, countries have been classified as follows: (a) Early-Intensive Adjustment Lending (EIAL) countries, if they 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; (b) Other Adjustment Lending (OAL) countries, if they started a programme after 1985 or received fewer than two SALs or fewer than three adjustment loans in 1985 or before; (c) No Adjustment Lending (NAL) countries if they received no adjustment loans between 1980 and 1988. The list of countries in each group is in Appendix A.

between performance in 1991-1995 and in 1986-1990 to capture long-term effects of programmes and issues of sustainability of reforms.

The use of period averages for the analysis is useful to eliminate year-to-year random fluctuations in the data and may be seen as a partial reply to the criticism that, in cross section studies, the response lag is treated as uniform across countries. Furthermore, by using period averages, attention is no longer restricted to the one or two years after programmes have ceased. This seems particularly inappropriate when analysing the export supply response.

It is well-known that any method of assessment of SAPs is fraught with difficulties, that no method is objectively superior to others and that, ultimately, it is not possible to say with certainty whether programmes have 'worked' or not. Three methods of assessment have been most widely used in the economic literature, namely the before-after approach, the with-without approach and the modified control group approach. It has been argued that each method can provide useful information, so long as the limitations of each method are fully taken into account and due care is exercised in distinguishing between positive and normative information (see Killick, 1995). In this spirit, all three approaches have been used in this paper.

3.1. The before-after approach

This approach compares macroeconomic performance during a programme and performance prior to the programme. In the context of regression analysis this is done by running a cross-section regression like (1) below on programme countries:

$$\Delta y_i = a_1 d_i \qquad (1)$$

Δy_i is the change in each of the target variables between programme years and previous years, d_i is a dummy variable that takes the value 1 for programme countries.

To check for robustness of results, trials have been made where OAL countries have been considered both as programme and non-programme countries.

The weakness of this approach is that, by assuming that non-programme determinants of macroeconomic outcomes remain unchanged over the period of analysis, all of the change in outcomes is attributed to programme factors. Nevertheless, the before-after approach will yield information on whether programmes are associated with an improvement in the initial situation.

3.2. The with-without approach

This approach compares macroeconomic performance in countries with programmes and performance in a control group of countries without programmes. In the context of regression analysis this is done by expanding equation (1) to include a constant term a_0:

$$\Delta y_i = a_0 + a_1 d_i \qquad (2)$$

where d_i is a dummy variable that takes the value 1 for programme countries and the value 0 for non-programme countries; hence, a_1 is the difference in the mean change of the target variable between programme and non-programme countries.

The weakness of this approach is that programme countries are not randomly selected so that, while differences in outcomes are attributed exclusively to the presence (absence) of programmes, differences in the starting positions between the two groups of countries may themselves be a cause of different economic performance. Furthermore, the refusal of countries with starting positions similar to programme countries to take on a SAL may be expected to negatively affect their subsequent performance. Thus, the two groups are not strictly comparable. Despite these

difficulties, the with-without approach provides some information on whether programme do better than non-programme countries.

3.3 An extended version of the modified control group approach

The with-without approach can be modified to account for the problem of non-random selection. This is done by controlling for the differences in initial positions in the comparison of subsequent economic performance. Essentially, the modified control group approach involves specifying an equation linking changes in each target variable to the programme dummy, lagged values of other target variables, lagged values of policy instruments, and any external variables that would affect the target variables. Formally, the equation estimated for the *j*th macroeconomic target variable in country *i* has the following form:

$$\Delta y_{ij} = b_{0j} - l_j \left(y_i\right)_{-1} + b_j \left(x_i\right)_{-1} + a_j W + b_j^P d_i + n_{ij} \qquad (3)$$

where Δ is the first difference operator, $\left(y_i\right)_{-1}$ is a $J \times 1$ vector of lagged target variables, x_i is a $K \times 1$ vector of policy instruments, W is a vector of foreign exogenous variables, d_i is a dummy variable denoting programme countries and n_{ij} is a random shock. The parameter b_j^P measures the effect of the programme on the target variable. All parameter vectors are conformable accordingly. Econometric estimation of (3) produces an estimate of b_j^P which is not subject to the criticisms levelled at the before-after and with-without approaches.

Crucial to the modified control group approach is the existence of policy reaction functions expressing how policy instruments change when the state of the economy changes. The reliability of results obtained from estimating equation (3) depends on the stability of the policy reaction functions, both across time and across

countries. Nevertheless, it is a sufficient condition for meaningful results to be obtained that the deviations in the reactions of instruments to targets should be random across time and across countries.[3]

This methodological approach, initially formulated by Goldstein and Montiel (1986), has been applied to assess the impact of IMF-supported programmes (Khan, 1990; Goldstein and Montiel, 1986) and World Bank programmes on output and export growth (Corbo and Rojas, 1992) but it is only in Kirkpatrick and Clarke (1992) that it has been used for the evaluation of trade policy reforms, although they make no distinction between Eial and Oal countries and do not test for export diversification.

The normal practice in the studies that employ this methodological approach is to choose a set of policy targets (for example, real GDP growth, export growth, the current account balance to GDP ratio, etc.) and a limited set of policy instruments (only the real exchange rate and the rate of change of domestic credit and/or the budget deficit to GDP ratio have been used). Each target variable would then be regressed on lagged values of *all* target variables and *all* policy instruments.[4] This procedure implies that the policy instruments, which respond to deviations of the lagged values of target variables from their desired values, are affected by all target variables and that the targets are interdependent.

This procedure may be sensible in certain circumstances but not in others. There is *a priori* no reason why a certain policy instrument should react to deviations of a number of target variables from their desired values and appear among the regressors for all target variables. To the contrary, it may be assumed that certain

[3] Other sources of bias are possible: for example, bias associated with interdependence between outcomes in programme and non-programme countries, as well as bias from aggregation across different types of programmes. Thus, caution is required in the assessment of programme effects. This caveat applies to all cross-country studies.

[4] Kirkpatrick and Clarke (1992) include no lagged instruments in the estimated equations.

policy instruments will not be affected by some target variables and should be excluded from the regression for those targets.

Likewise, there is no real reason why all target variables should appear in every equation, especially when the targets may not be closely related. This is likely to be the case for the variables analysed in this paper, where the rate of growth in total exports need not be accompanied by an increase in manufactured exports or in capacity, for example. In each equation, it is only targets that have policy instruments that are common to the dependent variable that should be included among the regressors.

The standard modified control group approach has been extended in this paper to allow for the specification of target-specific policy instruments. As a result, the set of policy instruments is significantly larger than in the standard approach and may or may not contain elements that are common to various targets.

Formally, for *J* targets and *K* instruments, the estimated equation for target *j* has the following form (see Appendix C for the formal derivation):

$$\Delta y_{ij} = b_{0j} - l_j \Theta_j \left(y_i\right)_{-1} + b_j \Omega_j \left(x_i\right)_{-1} + a_j W + b_j^P d_i + n_{ij} \qquad (4)$$

where Θ_j is a $J \times J$ diagonal matrix for the *j*th target with the diagonal elements equal to 1 or 0 according to whether the targets are interdependent insofar as they both affect some common policy instrument(s). Ω_j is a $K \times K$ diagonal matrix for the *j*th target (equation) with the diagonal elements equal to 1 or 0 depending on whether the *k*th instrument is a function of the target concerned.

The selection of the set of policy instruments has been made on both theoretical and empirical grounds. More precisely, the first step was to select a few policy instruments which, on the basis of theoretical considerations, may be expected to affect target variables and, in turn, to be adjusted according to the evolution of those

variables. In a second step, a broader set of eligible policy instruments was identified for each target but their final inclusion in each estimated regression was made to depend on their significance.

This procedure determined the following relationships between the set of targets and the set of policy instruments: the rate of export growth is a function of the real exchange rate, the degree of openness (measured by the total trade to GDP ratio) and macroeconomic stability (the inflation rate is used as a proxy); the rate of growth of GDP is a function of the real exchange rate and the degree of openness; manufacturing value added in GDP is a function of the real interest rate; the share of manufactured exports in total exports is a function of the investment to GDP ratio, the financial constraint imposed by the external debt burden (the debt to GDP ratio is used as a proxy) and the fiscal deficit as a percentage of GDP.

This procedure for instruments selection is obviously more complicated than the standard practice of using a small set of instruments common to all target variables. However, since most of the selected instruments turn out to be significant at normal confidence levels, the econometric results shed light not only on the overall impact of programmes (as reflected in the coefficient of the programme dummy) but also on the effects of specific policies. It is therefore a contention of this paper that this extension to the modified control group is an improvement on the standard procedure.

Finally, the specification of (4) also requires the selection of a set of exogenous external variables. Two variables were chosen, namely growth in terms of trade and the level of foreign demand (each country's exports to GDP ratio was used as a proxy[5]).

[5] The selection of this particular measure is likely to over-estimate the influence of foreign demand.

3. Export performance

Table 1 reports period averages of developing countries' export supply response. In order to assess whether this has been affected by SAPs, averages for EIAL, OAL and NAL countries are shown separately. Table 2 reports the results of econometric estimates of programme effects on export growth.

With the exception of OAL countries, where the rate of growth of exports has remained practically unchanged throughout the period, both EIAL and NAL countries have seen their export growth rates rising very fast in the second half of the 1980s. However, no further increases were registered in the 1991-1995 period. For EIAL countries the rate of export growth actually decelerated.

However, estimates obtained with the before-after approach show that no difference between countries' export performance is statistically significant. Both the with-without and the extended modified control group approach also confirm that SAPs do not seem to have affected either EIAL's or OAL's rate of growth of exports.

Results obtained from the modified control group show variables that significantly affect export growth. The rate of output growth, interpreted here as the increase in supply capacity, foreign demand and the real exchange rate have had a strong, positive effect in raising the rate of export growth relative to the pre-SAL period. This effect shows up both in the 1986-1995 period as a whole and in the 1986-1990 sub-period.

Thus, although SAPs do not seem to have caused better economic performance in programme countries, the results seem to suggest that the faster rates of export growth were achieved by those countries that brought their exchange rate to competitive levels. Interestingly, however, all the variables affecting exports positively

Table 1 - LDC's export supply response (period averages)

	1981-1985	1986-1995	1986-1990	1991-1995
Xg				
EIAL	4.4	7.2	7.4	6.8
OAL	4.3	4.6	4.7	4.4
NAL	3.9	5.1	5.1	5.1
GDPg				
EIAL	1.9	3.8	4.3	3.2
OAL	2.9	2.8	2.7	2.8
NAL	2.3	2.6	2.1	3.3
MANGDP				
EIAL	16.9	18.0	18.4	17.6
OAL	14.8	15.7	15.8	15.5
NAL	13.6	13.6	13.7	13.4
MANX				
EIAL	25.3	34.4	32.8	37.1
OAL	22.3	29.6	28.3	34.4
NAL	23.5	34.1	33.5	34.4

Notes: Variables sources and definitions are reported in Appendix B.

Table 2 - Programme effects on exports growth

Dependent variable: DXg

	1986/95-1981/85	1986/90-1981/85	1991/95-1986/90
Before-After			
EIAL	2.718	2.908	-0.506
	(1.26)	(1.20)	(-0.25)
EIAL & OAL	1.428	1.577	-0.397
	(0.97)	(0.97)	(-0.24)
With-Without			
EIAL=1	1.454	1.628	-0.351
	(0.48)	(0.48)	(-0.10)
OAL=1	-0.948	-0.850	-0.148
	(-0.32)	(-0.26)	(-0.04)
Extended Modified Control Group			
EIAL=1	2.725	2.769	1.410
	(1.57)	(1.10)	(0.45)
OAL=1	-1.008	0.034	-3.032
	(-0.57)	(0.01)	(-1.00)
Xg_{-1}	-1.070	-1.097	-1.289
	(-9.99)**	(-7.42)**	(-5.44)**
$GDPg_{-1}$	0.818	0.958	0.743
	(3.25)**	(2.62)**	(1.28)
TOTg	-20.387	-46.419	-28.728
	(-0.80)	(-1.54)	(-1.12)
X/GDP	29.470	65.402	2.436
	(2.87)**	(3.48)**	(0.12)
RER_{-1}	0.047	0.115	-0.103
	(2.01)*	(3.39)**	(-0.85)
$OPEN_{-1}$	-0.183	-0.382	0.074
	(-3.07)**	(-4.05)**	(0.50)
INF_{-1}	-1.0E-04	0.002	0.002
	(-0.06)	(0.66)	(0.56)

Notes to Tables 2-5: t-values are in parentheses. Variables sources and definitions are reported in Appendix B.

** Coefficient significant at the 1 percent level

* Coefficient significant at the 5 percent level

† Coefficient significant at the 10 percent level

seem to have ceased their influence in the 1991-1995 sub-period, when the rate of growth of exports dropped both in EIAL and OAL countries but not in NAL countries.

On the one hand this could simply be a statistical characteristic typical of any bounded random variable, whereby growth rates tend to decelerate when they are high and accelerate when they are low. In equations estimated with the modified control group approach, this effect would be reflected in a significantly negative coefficient of the lagged level of the dependent variable. This is indeed the case in all of the equations reported in this paper, with the exception of the share of manufactured exports in total exports. In this respect, however, it should be noted that this explanation, while perhaps sensible with respect to EIAL countries, may not be consistent with the experience in OAL countries, since their rates of export growth increased only very slightly during 1986-1990.

A more worrying explanation of the fall in export growth rates in EIAL countries is that the fast growth in the 1986-1990 period was not sustainable. As will be commented in the next section, both supply capacity and diversification of production (as measured by output growth and the share of manufacturing value added in GDP) fell in programme countries in the 1991-1995 period.

The degree of openness affected the growth of exports negatively both in the 1986-95 period as a whole and in the 1986-1990 sub-period but not during 1991-1995. Here too there may be different, though not necessarily mutually exclusive, explanations for this phenomenon. According to one, it is countries that were relatively closed and inward-oriented that benefited most from trade reforms and had the higher rates of export growth. According to this interpretation, once trade reforms are completed, they cease to act as a determinant of exports (Moguillansky, 1995).

Another explanation is that the liberalization of imports causes an initial boom in consumer goods imports and a strangulation of imported inputs. This affects mainly firms producing manufactures for exports. Although, as will be seen later, this explanation is consistent with the negative sign of the openness coefficient in the output equation, it should be noted that openness does not appear as a determinant either of the share of manufacturing value added in GDP or the share of manufactured exports in total exports.

4. Supply capacity and diversification of production

Table 1 also shows the evolution of output growth and the share of manufacturing value added in GDP. Tables 3 and 4 report the results of econometric estimation of programme effects on these two variables respectively.

Output growth doubled in EIAL countries between the pre- and post-SAL period. In fact, it more than doubled in the 1986-1990 period but slowed subsequently. Both the before-after and the with-without approaches show significantly positive effects of SAPs on output growth in 1986-1990 and significantly negative effects in the 1991-1995 sub-period compared to the previous one. While the positive effect is confirmed by the modified control group approach, the negative effect is not statistically significant.

The growth rate in OAL countries has remained virtually unchanged. In NAL countries it fell marginally in 1986-1990 but it rose in 1991-1995 to an average of 3.3% per year, slightly higher than in EIAL countries.

As mentioned in the previous section, openness has a significantly negative effect on output growth both in the 1986-1995 period as a whole and in the 1986-1990 sub-period. The coefficient of openness is, however, not significant in the 1991-1995

Table 3 - Programme effects on output growth

Dependent variable: DGDPg

	1986/95-1981/85	1986/90-1981/85	1991/95-1986/90
Before-After			
EIAL	1.863 (4.19)**	2.447 (5.45)**	-1.169 (-3.66)**
EIAL & OAL	0.789 (1.58)	1.015 (2.11)*	-0.535 (-1.24)
With-Without			
EIAL=1	1.535 (1.37)	2.625 (2.32)*	-2.292 (2.42)**
OAL=1	-0.498 (-0.46)	-0.085 (-0.08)	-1.092 (-1.19)
Extended Modified Control Group			
EIAL=1	1.058 (1.53)	2.182 (3.05)**	-1.157 (-1.23)
OAL=1	0.368 (0.54)	0.737 (1.07)	-0.169 (-0.20)
Xg_{-1}	-0.004 (-0.12)	3.9E-04 (0.01)	0.008 (0.16)
$GDPg_{-1}$	-0.891 (-10.65)**	-0.852 (-9.94)**	-0.534 (-3.57)**
TOTg	20.040 (2.07)*	4.622 (0.62)	7.261 (0.89)
X/GDP	4.855 (1.66)†	4.717 (1.29)	3.886 (0.93)
RER_{-1}	-0.003 (-1.26)	-0.004 (-2.03)*	6.6E-04 (0.29)
$OPEN_{-1}$	-0.035 (-2.07)*	-0.042 (-2.22)*	-0.002 (-0.06)

Notes: see Table 2

Table 4 - Programme effects on manufacturing production

Dependent variable: DMANGDP

	1986/95-1981/85	1986/90-1981/85	1991/95-1986/90
Before-After			
EIAL	1.129	1.553	-0.960
	(1.81)†	(2.86)**	(-2.36)*
EIAL & OAL	0.912	1.181	-0.631
	(2.14)*	(3.44)**	(-1.59)
With-Without			
EIAL=1	0.963	1.187	-0.355
	(1.09)	(1.70)	(-0.43)
OAL=1	0.537	0.457	0.289
	(0.62)	(0.66)	(0.35)
Extended Modified Control Group			
EIAL=1	1.275	0.957	0.073
	(1.25)	(1.10)	(0.08)
OAL=1	0.437	0.031	0.610
	(0.46)	(0.04)	(0.69)
$MANGDP_{-1}$	-0.129	-0.081	-0.109
	(-2.61)**	(-1.98)*	(-2.29)*
TOTg	-21.461	3.193	-3.499
	(-1.42)	(0.36)	(-0.34)
X/GDP	5.768	2.734	5.606
	(2.50)**	(1.30)	(2.79)**
RIR_{-1}	0.006	-0.024	-0.009
	(0.15)	(-0.75)	(-0.79)

Notes: see Table 2

sub-period. This is entirely consistent with the findings reported in the previous section on export growth. Both explanations mentioned there also apply here.

As expected, the coefficient of lagged output growth is significantly negative. The coefficient of terms of trade growth is significantly positive only in the 1986-1995 period but not in any of the sub-periods. An increase in terms of trade raises the capacity to import of a given quantity of exports. Thus, the import of inputs will also increase with positive effects on output growth. However, as the size of the estimated coefficient is very different in each of the estimated regressions, the result relative to terms of trade should be interpreted with caution. The same warning apply with respect to the coefficient of the real exchange rate. Although there are a number of channels through which real devaluations can lead to output contraction (see Lizondo and Montiel, 1989, for a review), the size of the estimated coefficient is very small.

The share of manufacturing value added in total GDP grew in EIAL countries from an average of 16.9% in 1981-1985 to 18.4% in 1986-1990. It fell a little in 1991-1995 to 17.6%. Both the increase and the fall in the ratio are statistically significant with the before-after approach but not with the alternative approaches.

The evolution of this ratio in OAL countries is very similar to that in EIAL countries: it rises in 1986-1990 from 14.8% to 15.8% and it falls in 1991-1995 to 15.5%. The positive effect of SAPs in 1986-1990 persists with the before-after approach even when OAL countries are considered as programme countries. In NAL countries this ratio remains practically unchanged: it rises from 13.6% to 13.7% in 1986-1990 and it falls to 13.4% in 1991-1995.

The extended modified control group approach suggests variables that significantly affect the evolution of the manufacturing value added to GDP ratio. These are the lagged value of this ratio and the exports to GDP ratio (which intends to

capture the influence of foreign demand relative to GDP). As foreign demand rises, there are more profit opportunities for exporters so long as production is reasonably diversified. It can be noted that the coefficient of the export to GDP ratio in the manufactured exports equation (see Table 5) is only significant in the 1986-1995 period as a whole but not in any of the sub-periods. This suggests that while foreign demand may have a determining influence on entrepreneurs' decisions to supply output, whether this materializes in exports depends on a host of other factors.

Financial liberalization is advocated by the World Bank as an important complement to trade reforms since productive firms may be credit rationed by restrictions and regulations. However, in the regressions reported in Table 4 the real interest rate, that has been used as a proxy for financial liberalization, does not have any statistically significant effect on the share of manufacturing value added to GDP.

5. Export diversification

Table 1 shows that the share of manufactured exports in total exports has increased substantially in all countries. It rose from 25.3% in EIAL countries in 1981-1985 to 32.8% in 1986-1990 and 37.1% in 1991-1995. In OAL countries this share increased from 22.3% to 28.3% rising further to 34.4% in 1991-1995. The before after approach shows in Table 5 that these increases are statistically significant and that SAPs have resulted in a higher share of manufactured exports.

NAL countries also increased their exports of manufactures at a higher rate than total exports. Their share rose from 23.5% to 33.5% in 1986-1990 and 34.4% in 1991-1995. The estimates obtained both with the with-without approach and the extended modified control group show that the performance of EIAL and OAL countries is not statistically different from that of NAL countries.

Table 5 - Programme effects on manufactured exports

Dependent variable: DMANX

	1986/95-1981/85	1986/90-1981/85	1991/95-1986/90
Before-After			
EIAL	8.378 (4.64)**	6.964 (4.85)**	2.505 (2.41)*
EIAL & OAL	8.905 (5.30)**	7.555 (5.08)**	2.624 (2.82)**
With-Without			
EIAL=1	-1.560 (-0.46)	-2.429 (-0.81)	1.613 (0.84)
OAL=1	-0.506 (-0.15)	-1.246 (-0.41)	1.868 (0.94)
Extended Modified Control Group			
EIAL=1	3.666 (0.92)	1.215 (0.33)	2.250 (0.96)
OAL=1	1.737 (0.47)	-0.105 (-0.03)	3.367 (1.29)
$MANX_{-1}$	0.025 (0.30)	0.019 (0.24)	-0.066 (-1.29)
TOTg	-25.880 (-0.42)	1.376 (0.04)	34.384 (1.38)
X/GDP	22.010 (2.18)*	16.068 (1.49)	5.249 (0.73)
D^*/GDP_{-1}	-0.151 (-2.60)**	-0.115 (-2.04)*	-0.026 (-1.88)†
FD/GDP_{-1}	-0.982 (-2.22)*	-0.849 (-2.05)*	-0.332 (-1.01)
I/GDP_{-1}	0.069 (0.52)	0.056 (0.44)	0.383 (1.80)†

Notes: see Table 2

In addition to foreign demand, already mentioned above, the share of manufactured exports is affected negatively by foreign debt and fiscal deficit (both expressed as a percentage of GDP). There are two channels through which the foreign debt ratio could affect the share of manufactured exports. One is by reducing the amount of imports (including inputs for producers of manufactures for exports) that a country can afford. The other channel is by requiring a larger real devaluation. Somewhat paradoxically, devaluation turns the internal terms of trade against manufacturing. Note, however, that the real exchange rate was not found significant.

The fiscal deficit has a puzzling negative effect on the change in the share of manufactured exports both in the 1986-1995 period and in the 1986-1990 sub-period. This may perhaps be explained by cuts in public sector investment that may have severely affected public enterprises, which in most developing countries are important exporters of manufactures. An alternative explanation is based on cuts in public sector investment in infrastructure. Finally, investment has a positive influence on the share of manufactured exports. Its coefficient, however, is only significant at the 10% confidence level.

6. Conclusions

The empirical results shown in this paper may be given different interpretations. For example, simply by looking at the significance of programme dummies in the regressions illustrated in previous sections, one may conclude that, overall, SAPs have not had much impact at all on programme countries. Where they had, as for example on the share of manufactured exports, there is no evidence that programme countries would have done worse by not adopting World Bank-supported programmes.

If this not so unusual result (for example, Kirkpatrick and Clarke, 1992; Mosley et al., 1991 also find little evidence of significant impact of SAPs on

programme countries) is not particularly comforting, it is not too damaging either. In fact, there is some evidence from the results of the extended modified control group that policies advocated within the context of SAPs do have the positive effects hoped for. The real exchange rate is a powerful instrument for adjustment by significantly stimulating exports. Reductions in the foreign debt burden, which are accompanied by the adoption of SAPs, are an important instrument for export diversification.

Even policies that are expected to lead to some adjustment costs, like cuts in budget deficits and import liberalization, only seem to entail short-run losses. In the 1991-1995 period none of the variables which have been used to assess LDC's export response is affected by any of these contractionary policies.

Thus, a more upbeat interpretation of the empirical results is that structural adjustment policies do seem to work. The fact that the coefficients of programme dummies do not indicate a differentially better performance of programme countries may be explained by the fact that trade reforms have been undertaken, of course to different degrees, by many LDCs, not just programme countries. What may differentiate countries' performance is, therefore, whether they are reformers or non-reformers, not programme or non-programme (see Nash, 1992; Thomas and Nash, 1991, for a similar assessment).

The findings of this paper, however, invite a note of caution. After the success of structural adjustment in 1986-1990, export growth, output growth, the share of manufacturing in GDP all fell in programme countries during 1991-1995, particularly in the EIAL countries. SAPs do not seem to have had a lasting or significant impact on supply capacity and diversification of production. If this interpretation is correct, the growth in exports may not be sustainable. Thus, while structural adjustment policies

seem to work in the short to medium run, the sustainability of trade policy reforms requires an explicit targeting of capacity and production diversification.

A large number of studies (Corbo and Rojas, 1992; World Bank, 1988 and 1990, among others) have found a significant reduction in investment in all programme countries. It has been argued, however, that the overall efficiency of investment has increased and that, therefore, it is the low-yielding unproductive investment that has been cut. The finding in this paper that SAPs have failed to generate an appropriate supply response provides indirect support for the alternative view that investment across the board, not just the ill-conceived one, has been a casualty of SAPs. The challenge for SAPs is to look beyond the short to medium run and encourage productive investment once more.

This interpretation of the empirical results should be qualified by the observation that, as often in large cross-section studies, different interpretations are also possible. In order to reach more solid conclusions, cross-section studies should be complemented by country studies and by analyses at a more disaggregated level to highlight the relevance of specific institutional structures and other characteristics. The agenda for future research is rather long.

Appendix A

Country classification

EIAL Countries

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

OAL Countries

Argentina, Bangladesh, Burkina Faso, Burundi, Central African Republic, Chad, China, Congo People's Republic, Ecuador, Gabon, Gambia, Guinea, Guinea-Bissau, Guyana, Honduras, Hungary, Indonesia, Mali, Nepal, Niger, Panama, Sierra Leone, Somalia, Sudan, Tunisia, Uganda, Uruguay, Zaire, Zimbabwe.

NAL Countries

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

Note: Yugoslavia included in the original World Bank list has been excluded.

Appendix B

Variables sources and definitions

The source of data is the World Bank's World Development Indicators: 1997 CD-Rom.

Following is a description of the variables:

(1) Dependent variables

Xg	Rate of growth of real exports
GDPg	Rate of growth of real GDP
MANGDP	Ratio of manufacturing value added to GDP
MANX	Ratio of manufactured exports to merchandise exports

(2) Other variables

D*/GDP	Ratio of total foreign debt to GDP
FD/GDP	Ratio of fiscal deficit to GDP
I/GDP	Ratio of domestic investment to GDP
INF	Inflation (wholesale price index)
OPEN	Openness, defined as the ratio of the sum of exports and imports to GDP

RER	Real exchange rate, defined as the relative prices of traded to non-traded goods. Because of problems with data availability, this was calculated as the ratio of each country's export price index (multiplied by the index of the nominal exchange rate) to the GDP deflator
RIR	Real interest rate
TOTg	Rate of growth of terms of trade
X/GDP	Calculated as the ratio of real exports to real GDP

(3) Dummy variables

EIAL=1	1 for EIAL countries, 0 otherwise
OAL=1	1 for OAL countries, 0 otherwise

Appendix C

Suppose that we have a number of policy targets (y_j), say three, and a number of policy instrument (x_k), say three. Let us assume that the first target is a function of two instruments, a world external variable (w), a programme dummy variable (d) and an error term.

$$y_1 = b_0 + b_1 x_1 + b_2 x_2 + a_1 w + b_1^p d + u_1 \qquad \text{(C1)}$$

Following Goldstein and Montiel (1986) one way of estimating the policy reaction function for x_1 is to relate it to the extent of the deviation of this target in the previous period, from its desired level, y_1^*. Hence:

$$x_1 - (x_1)_{-1} = g_1[y_1^* - (y_1)_{-1}] + m_1 \qquad \text{(C2)}$$

In addition, let us suppose that, in the same manner, the change in the level of policy instrument x_2 also depends on the target variable y_2. That is:

$$x_2 - (x_2)_{-1} = g_2[y_1^* - (y_1)_{-1}] + g_3[y_2^* - (y_2)_{-1}] + m_2 \qquad \text{(C3)}$$

Replacing for instruments in equation (C1) from equations (C2) and (C3) results in:

$$y_1 = (b_0 + b_1 g_1 y_1^* + b_2 g_2 y_1^* + b_2 g_3 y_2^*) - (b_1 g_1 + b_2 g_2)(y_1)_{-1} - b_2 g_3 (y_2)_{-1} +$$

$$b_1 (x_1)_{-1} + b_2 (x_2)_{-1} + a_1 w + b_1^p d + v_1 \qquad \text{(C4)}$$

Note that the desired levels of targets are now part of the constant in the above equation. A change in the target variable may then be expressed as follows:

$$\Delta y_1 = c - (b_1 g_1 + b_2 g_2 + 1)(y_1)_{-1} - b_2 g_3 (y_2)_{-1} + b_1 (x_1)_{-1} - b_2 (x_2)_{-1} + a_1 w + b_1^p d + v_1 \quad \text{(C5)}$$

where constant c reflects the first expression on the right had side of equation (C4).

Assuming that target y_2 is only affected by the level of instrument x_2 we will have:

$$y_2 = l_0 + l_1 x_2 + a_2 w + b_2^p d + u_2 \quad \text{(C6)}$$

The corresponding equation for change in the second target variable will be:

$$\Delta y_2 = (l_0 + l_1 g_2 y_1^* + l_1 g_3 y_2^*) - l_1 g_2 (y_1)_{-1} - [l_1 g_3 + 1](y_2)_{-1} - l_1 (x_2)_{-1} + a_2 w + b_2^p d + v_2 \quad \text{(C7)}$$

To consider all possibilities assume that the third target y_3 depends on an independent policy instrument, x_3, which has no bearing on other targets. That is:

$$y_3 = j_0 + j_1 x_3 + a_3 w + b_3^p d + u_3 \quad \text{(C8)}$$

Hence the reaction function for this policy instrument will be:

$$x_3 - (x_3)_{-1} = g_4 [y_3^* - (y_3)_{-1}] + m_3 \quad \text{(C9)}$$

resulting in the following equation for a change in the third target:

$$\Delta y_3 = (j_0 + j_1 g_4 y_3^*) - [j_1 g_4 + 1](y_3)_{-1} - j_1 (x_3)_{-1} + a_3 w + b_3^p d + v_3 \quad \text{(C10)}$$

From the above equations we may deduct that the explanatory lagged variables in the equations reflecting changes in the policy targets are determined with respect to whether an instrument affects a target or not and as to whether the same instrument affects more than one target. More specifically:

(i) If an instrument appears in two (or more) target equations the first difference equations for these targets include the lag variable for that instrument as well as the lag variables for both (or more) targets.

(ii) If an instrument is specific to a target then only the lag variable of that target (and instrument) will be present in its difference equation.

This approach is different from the traditional approach (as adopted by Goldstein and Montiel, 1986; Khan, 1990; Corbo and Rojas, 1992; Kirkpatrick and Clarke, 1992) whereby a fewer policy instruments were *all* assumed to affect *all* targets, hence every target was assumed to be a function of the lagged variables of all target and instrument variables.

The matrix form of the above equations for the jth target in the context of a cross country analysis will be

$$\Delta y_{ij} = b_{0j} - l_j \Theta_j (y_i)_{-1} + b_j \Omega_j (x_i)_{-1} + a_j W + b_j^p d_i + v_{ij} \qquad \text{(C11)}$$

where $(y_i)_{-1}$ and $(x_i)_{-1}$ are $J \times 1$ and $K \times 1$ vectors of lagged target and instrument variables, respectively; Θ_j and Ω_j are 0-1 diagonal matrices of the dimensions of $J \times J$ and $K \times K$ relevant to the lagged target and instrument variables for target j; W is the vector of world variables and d_i is a dummy variable denoting the programme countries. All parameter vectors are conformable respectively.

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