# The State of Industry in Sub-Saharan African Countries Undertaking Structural Adjustment Programmes

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## Abstract

Industry in Sub-Saharan African programme countries is in a severe crisis. Is this affecting the industrial base necessary for future growth and leading to de-industrialization? Or is the industry undergoing a process of efficient restructuring whereby the lack of growth is the result of inefficient industries shutting down? The analysis in this paper of a broad range of indicators provides some support for the hypothesis that Africa is on the brink of de-industrialization. The cross-country analysis, which compares Sub-Saharan programme countries with other programme countries, suggests that the programmes in Sub-Saharan Africa may have failed to account for indigenous structural characteristics that would have required a different approach with respect to the industrial sector.

## 1. Introduction

The objectives of stabilization and structural adjustment have dominated policy-making in Africa since the 1980s. The vast majority of Sub-Saharan countries (SSA) undertook such adjustment policies with the financial support of the International Monetary Fund and the World Bank. Adjustment was inevitable. Very low rates of growth of GDP per capita up to 1974 decelerated or turned negative thereafter. By the early 1980s, many SSA countries had a lower GDP per capita than before independence some twenty years earlier. This already bad economic situation became worse during the first half of the 1980s due to further terms of trade deterioration and sharply reduced access to international finance.

Structural Adjustment Programmes (SAPs), with their emphasis on trade liberalization, deregulation and privatization, are expected to lead to significant changes in the industrial sector. There is, however, an ongoing controversy on whether SAPs have in fact had beneficial effects on industry in SSA programme countries. Critics have argued that SAPs have caused not only a short-run stagnation or decline in industrial production but also the erosion of important parts of the industrial base for future growth (Lall, 1992; Stein, 1992; Taylor, 1993). In short, according to them, SAPs are causing the de-industrialization of Africa.

It has been argued that SAPs in Africa are bound to be unsuccessful because they miss underlying specific structural factors and are inappropriate to the individual countries' historical and institutional context (Stein, 1992; Stewart *et al.*, 1992; Tarp, 1993; Malima, 1994; Engberg-Pedersen *et al*., 1996). Therefore, as Helleiner [1994, p. 3] puts it, "it is time to call a formal end to a decade of structural adjustment in SSA".

A possible alternative hypothesis for the observed low industrial growth in SSA programme countries is that this is a short-run phenomenon reflecting a process of efficient restructuring rather than a sign of structural maladjustment of the economy. The World Bank [1994] remarks that countries that made large improvements in their macroeconomic policies had rates of industrial growth far in excess of countries that adjusted their macroeconomic policies less intensively if at all.

Adjustment in Africa is progressing more slowly than initially envisaged (Mosley and Weeks, 1993; World Bank, 1992a) because it takes a considerable time for the results of policy reforms to have an effect on economic performance. However, it is argued that only through persistence with structural adjustment countries will attain increased growth (Harvey, 1996; World Bank, 1994, 1997).

The objective of this paper is to investigate two main issues. Are SSA programme countries undergoing a process of de-industrialization? Is there empirical support for the hypothesis that SAPs have failed to account for structural characteristics specific to SSA?

The methodology of this study is presented in Section 2. Section 3 discusses the results of the empirical analysis. Conclusions are presented in Section 4.

## 2. Methodology

The analysis conducted in this paper has the following three main features: it considers a broad variety of aspects in its assessment of the state of industry; it is dynamic; and it is comparative. The necessity to look at a number of aspects and indicators derives from the fact that rates of manufacturing growth would not on their

own help discriminate between the competing hypotheses of de-industrialization and efficient restructuring. According to the World Bank [1994], an ongoing process of de-industrialization would manifest itself in significant and persistent[1] declines in industrial output, output share[2] of GDP and employment, stagnant productivity, and a pace and pattern of investment that are impeding long-run industrial growth and transformation. In this study the following aspects, together with the respective indicators, are thus suggested:[3]

*a) Performance* - The growth rate of real manufacturing value added is used as an indicator. The dynamism of the industrial sector can also be assessed by comparing the rate of growth of manufacturing value added with the rate of growth of GDP.

*b) Supply capacity* - This can be measured by the manufacturing share of GDP.

*c) Export diversification* - A measure of this is the ratio of manufactured exports to total merchandise exports.

*d) Employment* - It can be measured by the percentage of the labour force employed in manufacturing. Like for many of the other indicators that have been selected for this study, a simple look at its evolution over time may not lead to firm conclusions. For example, a fall in the employment share may have alternative explanations such as a shift towards more capital intensive techniques, an increase in the productivity of labour, or a process of de-industrialization. It is thus important to bring together information from a number of indicators.

*e) Productivity* - Because of the limited reliability of data on total factor productivity, we concentrate on the productivity of labour. This is measured by real manufacturing value added per worker.

*f) Technology* - Two aspects are of particular interest in this respect. One is the

transfer of technology to SSA industry. The other is technological advancement of SSA industry.

A proxy for the former is the ratio of imported machinery and transport equipment to total imports. This assumes that technological transfer, at the particular stage of SSA industrial development, takes place mainly through the import of machinery and transport equipment. In a broader sense, therefore, this indicator could be taken also as a proxy for the availability of imported intermediate inputs.

A proxy for technological advancement is the ratio of value added in production of machinery and transport equipment to total manufacturing value added. Typically, as industrialization progresses, the shares of intermediate and capital goods in industrial output increase, bringing greater industrial balance and independence (Chenery and Syrquin, 1986). It should be noted that this industrial "deepening" is usually associated with greater economies of scale, more advanced skills, and increased inter-industry linkages.

*g) Structural transformation* - The industrial structure can be described by the UNIDO index of industrial non-diversification.[4] This measures the contribution of individual manufacturing branches to total manufacturing value added. This index is, therefore, a measure of product non-diversification. The larger the index, the less diversified the industrial structure. It can be argued that, when industry is an engine of growth and structural transformation, the degree of diversification would tend to rise.

The information provided by this index alone cannot be interpreted unequivocally. For example, a rise in the index may reflect an efficient industrial restructuring where uncompetitive and inefficient sectors contract or, alternatively, a process of de-industrialization.

Thus, a second indicator of structural transformation is the investment to GDP ratio, as investment is the vehicle through which transformation takes place. It may be suggested that de-industrialization would be accompanied by lower investment ratios while restructuring by higher ratios. Nevertheless the evolution of the investment to GDP ratio should be interpreted with caution since a fall in the ratio could be a reflection of higher efficiency of investment. For this reason, the investment ratio should be compared with the rate of growth of GDP and other indicators.

The second major characteristic of the analysis is that it is dynamic and traces the evolution of these variables over time. The chosen period of analysis is 1980-1994. This sample period has been broken down into the following sub-periods: 1980-1985, 1986-1990 and 1991-1994. In addition to providing information on the evolution of variables over periods of approximately equal length,[5] this break down, which also includes the longer 1986-1994 sub-period, is useful for an assessment of the impact of SAPs.

Although SAPs were first introduced in SSA in the early 1980s, it is suggested that they would have an effect on industrialization only after a lag. In other words, it is likely that lending that took place during the 1980-1985 period had an effect on industrialization in the subsequent period. Thus, the 1980-1985 sub-period can be taken to represent the pre-SAP period, while 1986-1994 is the SAP period itself. The comparison of the 1980-1985 sub-period with subsequent sub-periods gives information on the association of SAPs with macroeconomic outcomes.

The use of period averages for the analysis is chosen to eliminate year-to-year random fluctuations in the data.[6] This seems particularly appropriate when analysing the process of industrialization which, by nature, is long term.[7]

The third feature of the analysis consists in the comparison of SSA programme countries with non-SSA programme countries. This is required for two major reasons. One is to control for trends across countries. For example, this comparison may help determine whether stagnation in the industrial sector is due to de-industrialization in SSA or is a reflection of a pattern common to other programme countries.

The second reason is that such comparison constitutes one possible formal test of the hypothesis that SAPs in Africa have disregarded indigenous characteristics. It should be noted that this 'control-group' type of analysis - commonly used for the evaluation of SAPs - normally compares the performance of programme countries with that of non-programme countries, i.e. the control group (for example, World Bank, 1990; Mosley *et al.*, 1991; Corbo and Rojas, 1992; Noorbakhsh and Paloni, 1998). This comparison, however, would not be informative of the alleged neglect of SAPs *in Africa* to take into account indigenous structural characteristics. The assessment of this argument requires control for the policies undertaken in the two groups of countries, i.e. structural adjustment policies should be common to both groups. In other words, SSA programme countries should be compared not with non-programme countries but with non-SSA programme countries.[8]

It may also be noted that the hypothesis of neglect of African features has normally been advanced in the literature only on the basis of evidence from country case studies and has not been subjected to formal tests.

In the comparison of SSA and non-SSA programme countries, however, it is important that the composition of SSA is properly taken into account and that the comparison is between homogenous groups of countries. Our sample includes 29 SSA programme countries,[9] with 12 being classified as Early Intensive Adjustment Loan

(EIAL) countries.[10] The vast majority are low income[11] and not highly industrialized. More precisely, 23 are classified as low income. If we measure the degree of industrialization by the share of manufacturing in GDP, in 20 of the countries for which data were available this share was in 1980-1985 less than 15%.

Correspondingly the following comparisons between programme countries are carried out:[12] (i) SSA with non-SSA countries; (ii) SSA with non-SSA EIAL countries; (iii) SSA with non-SSA low-income countries; (iv) SSA with non-SSA middle-income countries; (v) SSA with non-SSA less-industrialized countries;[13] (vi) SSA with non-SSA more-industrialized countries.

In order to evaluate whether the differences between SSA and non-SSA programme countries are statistically significant we run cross-sectional regressions of the following form:

$$y_i = a + bd_i$$

$y_i$ denotes the variable of interest for country *i*; $d_i$ is a dummy variable that takes the value 1 if country *i* is SSA, 0 otherwise. $a$ is the mean value of the variable of interest for the reference group, i.e. the non-SSA countries. A statistically significant value for $b$ would indicate that the value of the variable of interest for SSA is different from that in non-SSA countries. The average value for SSA countries can be calculated by adding together the estimated coefficients $a$ and $b$.

## 3. Empirical analysis

### *3.1. Industrial performance*

This is reported in Table 1. Real value added in manufacturing accelerated in all SSA groups during 1986-1990. Growth was higher in the SSA more industrialized

SAP countries. The fastest acceleration was in SSA EIAL countries, which grew at an

**Table 1 - Performance**

| | 1980-1985 | 1986-1994 | 1986-1990 | 1991-1994 |
|---|---|---|---|---|
| **MVAg** | | | | |
| (i) SAP developing countries | 2.728 | 5.401 | 5.332 | 5.742 |
| | (2.57)** | (7.07)** | (5.66)** | (5.44)** |
| SAP SSA | 1.111 | -2.642 | -0.768 | -5.172 |
| | (0.76) | (-2.52)** | (-0.59) | (-3.54)** |
| (ii) EIAL developing countries | 2.412 | 5.143 | 6.119 | 3.971 |
| | (1.94)+ | (6.03)** | (5.77)** | (4.57)** |
| EIAL SSA | 0.142 | -2.046 | -1.204 | -3.211 |
| | (0.08) | (-1.66) | (-0.79) | (-2.61)** |
| (iii) Low income SAP countries | 7.930 | 9.220 | 7.221 | 11.718 |
| | (3.68)** | (7.32)** | (4.61)** | (5.59)** |
| Low income SAP SSA | -5.268 | -6.745 | -3.545 | -10.464 |
| | (-2.20)* | (-4.76)** | (-2.02)* | (-4.39)** |
| (iv) Middle income SAP countries | 1.504 | 4.277 | 4.776 | 3.874 |
| | (1.39) | (4.65)** | (3.94)** | (4.16)** |
| Middle income SAP SSA | 5.669 | -0.621 | 2.600 | -5.242 |
| | (2.68)** | (-0.34) | (1.10) | (-2.94)** |
| (v) Less industrialized SAP | 5.988 | 7.433 | 6.283 | 8.871 |
| | (2.45)* | (5.16)** | (3.25)** | (4.63)** |
| Less industrialized SAP SSA | -2.453 | -4.590 | -1.895 | -7.569 |
| | (-0.91) | (-2.85)** | (-0.88) | (-3.49)** |
| (vi) More industrialized SAP | 1.960 | 4.803 | 5.052 | 4.764 |
| | (1.70) | (5.10)** | (5.03)** | (3.68)** |
| More industrialized SAP SSA | 3.318 | -1.261 | 2.593 | -7.358 |
| | (1.26) | (-0.59) | (1.13) | (-2.55)* |
| **GDPg** | | | | |
| (i) SAP countries | 3.051 | 4.532 | 4.308 | 4.812 |
| | (5.08)** | (10.02)** | (8.92)** | (7.76)** |
| SAP SSA | -0.965 | -2.322 | -1.309 | -3.709 |
| | (-1.18) | (-3.80)** | (-2.01)* | (-4.39)** |
| (ii) EIAL developing countries | 2.764 | 4.812 | 5.200 | 4.327 |
| | (4.50)** | (8.03)** | (7.72)** | (7.10)** |
| EIAL SSA | -1.537 | -2.281 | -1.773 | -2.916 |
| | (-1.73)+ | (-2.64)** | (-1.82)+ | (-3.31)** |
| (iii) Low income SAP countries | 6.403 | 6.377 | 5.913 | 6.958 |
| | (6.37)** | (7.39)** | (8.35)** | (4.57)** |
| Low income SAP SSA | -4.832 | -4.028 | -2.784 | -5.728 |
| | (-4.34)** | (-4.23)** | (-3.56)** | (-3.40)** |
| (iv) Middle income SAP countries | 2.169 | 4.046 | 3.885 | 4.247 |
| | (3.14)** | (7.43)** | (5.72)** | (7.47)** |
| Middle income SAP SSA | 1.806 | -2.374 | -1.386 | -3.608 |
| | (1.28) | (-2.13)* | (-1.00) | (-3.11)** |
| (v) Less industrialized SAP | 4.709 | 5.001 | 4.936 | 5.084 |
| | (3.63)** | (5.64)** | (6.02)** | (3.41)** |
| Less industrialized SAP SSA | -2.862 | -3.062 | -2.080 | -4.493 |
| | (-1.97)+ | (-3.09)** | (-2.27)* | (-2.69)** |
| (vi) More industrialized SAP | 2.531 | 4.801 | 4.646 | 4.995 |
| | (3.45)** | (8.26)** | (6.97)** | (7.76)** |
| More industrialized SAP SSA | 1.384 | -1.743 | -1.007 | -2.664 |
| | (0.90) | (-1.43) | (-0.72) | (-1.97)+ |

MVAg: rate of growth of real manufacturing value added.
GDPg: rate of growth of Gross Domestic Product.
** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

average of 4.9% per year. This is the only increase in growth among SSA groups that is statistically different from the rate in the previous 1980-1985 period.[14] During this period, the only significant gap between SSA and non-SSA groups is in the low income SAP countries, although it should be pointed out that the rates of growth in non-SSA groups - with the exception of the middle income and the more industrialized countries - were faster than in SSA groups.

Industrial performance in SSA worsened dramatically during 1991-1994. For all SSA groups, growth in this period was statistically significantly lower than in the previous period. The middle income and the more industrialized SSA programme countries registered an average contraction of 1.4% and 2.6% respectively. Despite overall positive, but small, rates of growth for the SSA EIAL and the SSA programme countries, nearly half of the countries in these samples also registered negative rates of growth.

For the overall 1986-1994 period, only the SSA EIAL countries managed to somewhat improve their performance compared to the 1980-1985 period: their rates of growth of manufacturing rose from 2.6% to 3.1%. Such a small increase is not statistically significant. In all other SSA groups, the average growth rates for the overall 1986-1994 period were lower than in the preceding 1980-1985 period, though the differences are not statistically significant.

This poor industrial performance of SSA was not a phenomenon occurring also in non-SSA programme countries. Only in EIAL countries growth slowed down somewhat in 1991-1994 but, over the entire 1986-1994 period, their rates of growth were more than twice those in 1980-1985: manufacturing growth rose from 2.4% to 5.1%. Thus, a significantly wide gap opened in 1991-1994 between all SSA and non-

SSA groups.

An assessment of the dynamism of the industrial sector can also be made by comparing the rate of growth of manufacturing with that of the entire economy. Average rates of growth of output are very low in all SSA groups. During 1980-1985 the SSA groups with the worst performances were the EIAL countries, the low income countries and the less industrialized countries, with rates of growth only 1.2%, 1.6% and 1.9% per year respectively. The performance of these groups was significantly worse than the respective comparison groups.

The performance of almost all SSA groups improved in the 1986-1990 period, although the improvement is statistically significant only in the case of the SSA low income countries. During the same period, the rates of output growth were higher in non-SSA programme countries in all cases. Among the SSA groups, the higher rates of growth were recorded in the EIAL countries and the more industrialized countries, with average rates of growth of 3.4% and 3.6% per year respectively.

With data showing good economic recovery, an even stronger growth of manufacturing, and EIAL countries performing better than less intensive adjusters, the World Bank [1994] optimistically concluded that "adjustment is working" (p. 1) and that, although the reforms undertaken are fragile and the reforming effort is still incomplete, "there is hope that Africa, like East Asia thirty years ago, will move onto a faster development track" (*ibid*, p. 2).

The events in the 1991-1994 period question whether such optimistic statements had sound foundations. In all SSA groups, the growth of output during this period was statistically significantly worse than in 1986-1990 and was back to pre-reforms levels or worse. Thus, output growth in the overall 1986-1994 period was not

statistically different from the pre-SAP period. The EIAL countries are an important exception, since their rates of growth rose from 1.2% to 2.5% and this increase is statistically significant.

In non-SSA groups, performance in 1991-1994 improved relative to the previous 1986-1990 period. The only exception in this respect were the non-SSA EIAL countries, where growth fell from 5.2% to 4.3%. The gap between SSA and non-SSA groups is, in this period, statistically significant in all cases.

Stagnant rates of manufacturing growth and low levels of output growth during the most recent 1991-1994 period are *prima facie* evidence that industries are not conducive to growth and structural transformation in SSA countries. As explained in the section on methodology, however, a more definite assessment requires an analysis of a series of other indicators.

### *3.2. Supply capacity*

Table 2 shows that the manufacturing share in GDP is small in all SSA groups. In SSA the largest increase in the ratio between 1991-1994 and 1980-1985 is of 1.7% and occurs in the group of the EIAL countries. Comparing the entire SAP period to the pre-SAP period, the majority of SSA groups registered a statistically significant increase in the manufacturing share, although, in view of the low rates of manufacturing and output growth, this increase can hardly be a motive for satisfaction. Over time, the increase in the share in SSA is in fact very small and, consequently, there is little evidence of any catching up with non-SSA groups. In the SSA low income countries and the more industrialized countries, the manufacturing share is practically unchanged over time.

**Table 2 - Supply capacity**

| | 1980-1985 | 1986-1994 | 1986-1990 | 1991-1994 |
|---|---|---|---|---|
| **MANGDP** | | | | |
| (i) SAP countries | 19.913 | 20.574 | 20.566 | 20.837 |
| | (14.92)** | (14.83)** | (14.68)** | (13.95)** |
| SAP SSA | -9.053 | -9.508 | -9.020 | -9.444 |
| | (-4.947)** | (-5.00)** | (-4.74)** | (-4.57)** |
| (ii) EIAL developing countries | 21.027 | 21.746 | 21.767 | 22.245 |
| | (17.04)** | (13.59)** | (14.06)** | (12.64)** |
| EIAL SSA | -9.007 | -8.193 | -8.379 | -8.493 |
| | (-5.06)** | (-3.55)** | (-3.75)** | (-3.41)** |
| (iii) Low income SAP countries | 15.232 | 17.412 | 16.566 | 18.468 |
| | (5.05)** | (5.36)** | (5.29)** | (5.23)** |
| Low income SAP SSA | -5.070 | -7.167 | -6.272 | -7.906 |
| | (-1.50) | (-1.98)+ | (-1.79)+ | (-1.98)+ |
| (iv) Middle income SAP countries | 21.289 | 21.504 | 21.742 | 21.578 |
| | (16.64)** | (16.73)** | (16.47)** | (15.83)** |
| Middle income SAP SSA | -8.218 | -7.151 | -6.026 | -7.193 |
| | (-3.28)** | (-2.65)** | (-2.33)* | (-2.58)* |
| (v) Less industrialized SAP | 10.741 | 12.445 | 11.977 | 13.029 |
| | (7.86)** | (7.43)** | (7.15)** | (7.71)** |
| Less industrialized SAP SSA | -2.105 | -2.988 | -2.578 | -3.175 |
| | (-1.38) | (-1.60) | (-1.38) | (-1.66) |
| (vi) More industrialized SAP | 22.610 | 22.965 | 23.092 | 23.277 |
| | (18.47)** | (15.10)** | (16.92)** | (13.07)** |
| More industrialized SAP SSA | -2.854 | -2.730 | -2.114 | -3.525 |
| | (-1.11) | (-0.78) | (-0.74) | (-0.89) |

MANGDP: ratio of manufacturing value added to GDP.

** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

Moreover, in the groups of all programme countries, the middle income countries and the more industrialized countries the manufacturing share in 1991-1994 is lower than in the 1986-1990 period. In all SSA groups, half or more of the countries with available data registered a contraction in the share during 1991-1994.

### *3.3. Export diversification*

As can be seen from Table 3, the share of manufactures in total exports is in all SSA groups lower than in non-SSA groups. The difference between SSA and non-SSA groups is significant in all but two cases, namely the middle income countries and the more industrialized countries. It is important to note, however, not only that

these two SSA groups have a small size but also that, in the case of this indicator, they are very heterogeneous both in terms of the level of the share of manufactures and its evolution over time. The empirical results relative to these groups should therefore be interpreted with caution.

**Table 3 - Export diversification**

| | 1980-1985 | 1986-1994 | 1986-1990 | 1991-1994 |
|---|---|---|---|---|
| **MANX** | | | | |
| (i) SAP countries | 33.606 | 49.609 | 47.190 | 50.692 |
| | (9.18)** | (11.46)** | (11.05)** | (10.93)** |
| SAP SSA | -23.410 | -34.119 | -32.131 | -34.117 |
| | (-4.61)** | (-5.63)** | (-5.37)** | (-4.82)** |
| (ii EIAL developing countries | 34.727 | 51.298 | 48.185 | 52.644 |
| | (6.59)** | (8.62)** | (7.85)** | (8.46)** |
| EIAL SSA | -24.694 | -35.272 | -32.118 | -35.699 |
| | (-3.25)** | (-4.10)** | (-3.63)** | (-3.78)** |
| (iii) Low income SAP countries | 42.980 | 71.425 | 65.910 | 73.777 |
| | (7.82)** | (12.37)** | (11.05)** | (13.43)** |
| Low income SAP SSA | -35.070 | -59.119 | -54.212 | -61.607 |
| | (-5.71)** | (-.9.11)** | (-8.09)** | (-9.53)** |
| (iv) Middle income SAP countries | 31.139 | 43.867 | 42.263 | 44.618 |
| | (6.29)** | (7.84)** | (7.59)** | (7.72)** |
| Middle income SAP SSA | -13.323 | -18.298 | -16.563 | -16.588 |
| | (-1.30) | (-1.60) | (-1.46) | (-1.31) |
| (v) Less industrialized SAP | 37.140 | 58.962 | 55.850 | 60.530 |
| | (6.26)** | (8.70)** | (8.30)** | (7.96)** |
| Less industrialized SAP SSA | -29.138 | -47.968 | -45.397 | -48.068 |
| | (-4.39)** | (-6.33)** | (-6.03)** | (-5.52)** |
| (vi) More industrialized SAP | 32.015 | 47.415 | 44.129 | 48.745 |
| | (6.06)** | (7.72)** | (7.19)** | (7.92)** |
| More industrialized SAP SSA | -11.627 | -17.623 | -14.329 | 0.730 |
| | (-0.96) | (-1.25) | (-1.02) | (0.04) |

MANX: ratio of manufacturing exports to total exports.

** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

The export share of manufactures is rising in all SSA groups between the pre-SAP and the SAP period and this increase is statistically significant in all cases, again with the exception of the middle income countries and the more industrialized countries.

While the increase in the share of manufactured exports in total exports is an important improvement, it must be stressed that, without much stronger growth in

manufacturing value added, the increase in the export share of manufactures in SSA is not likely to be sustainable. Table 3 shows that the increase in the export share in SSA slowed down in 1991-1994 quite dramatically in all groups.[15] In fact, in more than half of the countries for which data are available, the share in 1991-1994 fell or stayed the same.

Moreover, the growth in the export share of manufactures is in all non-SSA groups much faster than in SSA and, although it slowed down in 1991-1994, the share actually declined during this period in less than a handful of countries. Therefore, the gap between SSA and non-SSA groups has increased over time.

A further qualification to the increase in the export share of manufactures concerns their composition. It has been observed that the increase in the export share in some trade liberalizing countries has been accompanied by a significant shift in the composition of manufactured exports towards less highly processed goods (for example, Jenkins, 1996). With reference to SSA, Wangwe [1995] remarks that competitive pressures alone may not lead to an expansion of the export base towards higher processing of existing primary products as this requires technological, organizational and marketing capabilities which are in short supply.

### *3.4. Employment*

As shown in Table 4, the share of the labour force employed in manufacturing is in all SSA groups lower than in other groups. In all SSA groups there is a persistent, uninterrupted fall in the share over time.[16] The fall in the share is statistically significant for all SSA groups but the more industrialized countries.

In the non-SSA groups, the share of manufacturing employment rose over

time, both in the low income countries and the less industrialized countries. Thus, for these two groups of countries, the gap between SSA and non-SSA countries has increased over time. For the other groups, the gap has remained practically unchanged. For all groups, though, the gap between SSA and non-SSA countries is statistically significant.

Since the non-SSA groups of programme countries and EIAL countries have experienced drops in the share of manufacturing employment similar to that of the SSA groups, it does not seem to be the case that the fall in the share in the respective SSA groups may be due solely to the increase in the labour force in SSA.

**Table 4 - Employment**

| | **1980** | **1985** | **1990** | **1994** |
|---|---|---|---|---|
| **MANLF** | | | | |
| (i) SAP countries | 6.673 | 6.212 | 6.377 | 6.086 |
| | (7.08)** | (7.12)** | (7.88)** | (9.90)** |
| SAP SSA | -5.198 | -4.905 | -5.178 | -4.953 |
| | (-3.55)** | (-3.62)** | (-4.12)** | (-5.19)** |
| (ii) EIAL developing countries | 6.097 | 5.594 | 5.799 | 5.684 |
| | (7.25)** | (6.60)** | (6.92)** | (7.07)** |
| EIAL SSA | -4.678 | -4.418 | -4.665 | -4.668 |
| | (-3.56)** | (-3.34)** | (-3.56)** | (-3.71)** |
| (iii) Low income SAP countries | 1.922 | 2.634 | 3.249 | 3.792 |
| | (4.31)** | (4.49)** | (4.92)** | (5.18)** |
| Low income SAP SSA | -1.007 | -1.806 | -2.434 | -3.040 |
| | (-1.90)+ | (-.2.59)* | (-3.10)** | (-3.49)** |
| (iv) Middle income SAP countries | 7.924 | 7.153 | 7.200 | 6.690 |
| | (6.30)** | (5.99)** | (6.50)** | (8.26)** |
| Middle income SAP SSA | -5.102 | -4.697 | -5.078 | -4.640 |
| | (-1.85)+ | (-1.80)+ | (-2.09)* | (-2.62)** |
| (v) Less industrialized SAP | 1.961 | 2.178 | 2.584 | 3.330 |
| | (3.32)** | (4.25)** | (5.87)** | (5.80)** |
| Less industrialized SAP SSA | -0.566 | -0.953 | -1.453 | -2.292 |
| | (-0.81) | (-1.56) | (-2.77)** | (-3.35)** |
| (vi) More industrialized SAP | 6.988 | 6.337 | 6.622 | 6.439 |
| | (7.49)** | (7.60)** | (7.83)** | (8.21)** |
| More industrialized SAP SSA | -4.396 | -4.064 | -4.494 | -4.301 |
| | (-1.83)+ | (-1.89)+ | (-2.06)* | (-2.12)* |

MANLF: ratio of manufacturing employment to total labour force.

** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

### *3.5. Productivity*

As can be seen in Table 5, in all SSA groups labour productivity in 1994 was about at the same level as in 1985, and, in some cases, lower. Productivity rose in all SSA groups in 1990 and fell in 1994.

Thus, although employment cuts may be an important explanation for the productivity increase in 1990, the evolution of labour productivity cannot be explained only by variations in employment since, in 1994, both employment and labour productivity fell.

**Table 5 - Productivity**

| | **1980** | **1985** | **1990** | **1994** |
|---|---|---|---|---|
| **MVAL** | | | | |
| (i) SAP countries | 9.757 | 11.302 | 11.920 | 13.999 |
| | (7.99)** | (7.89)** | (7.94)** | (7.60)** |
| SAP SSA | -0.595 | -1.668 | -0.780 | -4.306 |
| | (-0.31) | (-0.74) | (-0.33) | (-1.51) |
| (ii) EIAL developing countries | 11.258 | 13.169 | 14.265 | 16.021 |
| | (8.23)** | (6.88)** | (6.30)** | (6.97)** |
| EIAL SSA | -3.869 | -4.301 | -3.358 | -7.195 |
| | (-1.75)+ | (-1.39) | (-0.92) | (-2.00)* |
| (iii) Low income SAP countries | 2.777 | 2.975 | 3.521 | 4.059 |
| | (1.27) | (1.29) | (1.72) | (1.81)+ |
| Low income SAP SSA | 5.503 | 5.002 | 5.352 | 3.741 |
| | (2.08)+ | (1.81)+ | (2.17)* | (1.40) |
| (iv) Middle income SAP countries | 11.594 | 13.493 | 14.130 | 16.614 |
| | (9.04)** | (8.87)** | (8.58)** | (7.54)** |
| Middle income SAP SSA | -0.490 | -0.213 | 1.997 | -2.381 |
| | (-0.18) | (-0.06) | (0.55) | (-0.49) |
| (v) Less industrialized SAP | 3.707 | 4.352 | 4.959 | 4.693 |
| | (1.71) | (1.55) | (1.40) | (1.68) |
| Less industrialized SAP SSA | 4.695 | 4.858 | 6.008 | 4.664 |
| | (1.80)+ | (1.43) | (1.41) | (1.40) |
| (vi) More industrialized SAP | 11.326 | 13.461 | 14.168 | 17.137 |
| | (7.86)** | (7.83)** | (8.85)** | (6.89)** |
| More industrialized SAP SSA | -0.778 | -1.247 | -1.575 | -4.995 |
| | (-0.21) | (-0.28) | (-0.38) | (-0.78) |

MVAL: real manufacturing value added per worker.

** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

In non-SSA groups, productivity rose faster than in SSA groups. However, in 1994, the only gap that is statistically significant is that between SSA and non-SSA EIAL countries.

### *3.6. Technology*

The evolution of the ratio of imported machinery and transport equipment to total imports is reported in Table 6. In SSA groups this ratio rose in the 1986-1990 period and fell during 1991-1994 to the same levels as in the pre-SAP period.

It can be noted that the evolution of this ratio over time seems to match the evolution of productivity rather closely[17] and may provide some justification for the choice of this ratio as a proxy for the transfer of technology and the availability of imported inputs. Thus, there seems to be empirical support for the hypothesis that SSA industry is strongly dependent on imported inputs and technology (Meier and Steel, 1989).

In non-SSA groups, the ratio has increased over time and while it was in these countries lower than in SSA countries during the pre-SAP period, it became higher than in SSA countries in 1991-1994. However, the gap between SSA and non-SSA groups is not significant.

The fall in the ratio in SSA countries during 1991-1994 may be attributed to strangulation of imported inputs resulting from trade liberalization, the adoption of less imported-input-intensive technologies or the closure of - presumably non-competitive - industries heavily dependent on imported inputs. The data may appear not to lend support to the hypothesis of strangulation of imported inputs. Firstly, since

this is essentially a short-run response to trade liberalization, it would be reflected in a fall in

**Table 6 - Technology**

| | 1980-1985 | 1986-1994 | 1986-1990 | 1991-1994 |
|---|---|---|---|---|
| **MTIM** | | | | |
| (i) SAP countries | 28.214 | 33.442 | 31.521 | 34.443 |
| | (18.65)** | (20.56)** | (19.52)** | (19.87)** |
| SAP SSA | 2.178 | -1.488 | 0.609 | -4.368 |
| | (1.04) | (-0.50) | (0.21) | (-1.15) |
| (ii) EIAL developing countries | 27.112 | 34.492 | 32.861 | 34.969 |
| | (12.45)** | (16.28)** | (14.90)** | (16.52)** |
| EIAL SSA | 1.634 | -2.620 | -0.633 | -6.539 |
| | (0.52) | (-0.73) | (-0.17) | (-1.63) |
| (iii) Low income SAP countries | 29.470 | 31.330 | 30.220 | 33.396 |
| | (11.49)** | (7.21)** | (6.71)** | (6.07)** |
| Low income SAP SSA | 1.143 | 1.537 | 2.855 | -1.996 |
| | (0.40) | (0.26) | (0.47) | (-0.24) |
| (iv) Middle income SAP countries | 27.884 | 33.997 | 31.863 | 34.663 |
| | (13.50)** | (20.10)** | (19.49)** | (19.16)** |
| Middle income SAP SSA | 1.774 | -3.414 | -1.151 | -5.913 |
| | (0.42) | (-0.84) | (-0.29) | (-1.21) |
| (v) Less industrialized SAP | 26.830 | 27.987 | 26.780 | 29.254 |
| | (11.22)** | (6.94)** | (6.58)** | (5.63)** |
| Less industrialized SAP SSA | 3.080 | 3.938 | 5.270 | -0.079 |
| | (1.15) | (0.77) | (1.02) | (-0.01) |
| (vi) More industrialized SAP | 28.974 | 35.514 | 33.418 | 36.163 |
| | (11.80)** | (20.54)** | (20.43)** | (19.36)** |
| More industrialized SAP SSA | 2.810 | -3.448 | -0.968 | -4.288 |
| | (0.44) | (-0.65) | (-0.19) | (-0.75) |
| **MTVA** | | | | |
| (i) SAP countries | 11.477 | 11.733 | 11.530 | 12.782 |
| | (7.90)** | (7.49)** | (7.23)** | (6.75)** |
| SAP SSA | -5.123 | -7.416 | -7.131 | -7.598 |
| | (-2.40)* | (-2.95)** | (-2.79)** | (-2.04)* |
| (ii) EIAL developing countries | 11.716 | 13.576 | 12.747 | 16.017 |
| | (6.29)** | (6.15)** | (5.91)** | (5.81)** |
| EIAL SSA | -4.522 | -9.003 | -8.108 | -10.815 |
| | (-1.67) | (-2.74)** | (-2.52)* | (-2.27)* |
| (iii) Low income SAP countries | 12.235 | 10.281 | 10.103 | 13.095 |
| | (4.55)** | (3.94)** | (3.88)** | (2.54)+ |
| Low income SAP SSA | -6.335 | -6.505 | -6.306 | -8.367 |
| | (-2.04)+ | (-2.00)+ | (-1.94)+ | (-1.15) |
| (iv) Middle income SAP countries | 11.298 | 12.160 | 11.949 | 12.727 |
| | (6.10)** | (5.99)** | (5.74)** | (5.96)** |
| Middle income SAP SSA | -4.039 | -6.871 | -6.467 | -7.202 |
| | (-1.11) | (-1.61) | (-1.48) | (-1.47) |
| (v) Less industrialized SAP | 7.165 | 5.762 | 5.633 | 5.426 |
| | (3.06)** | (3.66)** | (3.62)** | (1.94) |
| Less industrialized SAP SSA | -0.384 | -1.521 | -1.339 | 0.497 |
| | (-0.14) | (-0.80) | (-0.71) | (0.14) |
| (vi) More industrialized SAP | 11.897 | 13.346 | 12.809 | 14.484 |
| | (6.87)** | (5.98)** | (5.90)** | (6.02)** |
| More industrialized SAP SSA | -5.792 | -8.054 | -7.300 | -9.472 |
| | (-1.54) | (-1.24) | (-1.15) | (-1.35) |

MTIM: ratio of imported machinery and transport equipment to total imports.

MTVA: ratio of value added in production of machinery and transport equipment to total manufacturing value added.

** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

the ratio during the 1986-1990 period. In fact, the ratio increased in this period. Secondly, since structural adjustment policies are common to the control group, the ratio should fall in all non-SSA groups too. In fact, as noted above, in these countries the ratio increased in all groups. Nevertheless, the hypothesis of strangulation of imported inputs cannot be discarded altogether since it is possible that trade liberalization had different effects in the two groups of countries.

The ratio of value added in production of machinery and transport equipment to total manufacturing value added has increased in non-SSA countries and, with the exception of the less industrialized countries, it is in 1991-1994 higher than in 1980-1985 in all cases. In SSA, the ratio, though increasing in 1991-1994 relative to 1986-1990, is lower than in 1980-1985 in all cases. Thus, with the exception of the less industrialized countries, the gap in the 1991-1994 period between SSA and non-SSA groups has widened with respect to the initial 1980-1985 period and, in the groups of EIAL and all programme countries, is statistically significant. These data provide, therefore, no evidence of technological advancement in SSA industry.

It may be interesting to note that, during the SAP period, the SSA EIAL countries registered the largest contraction in the ratio of all SSA groups, while the non-SSA EIAL registered the largest expansion of all non-SSA groups.

### *3.7. Structural transformation*

See Table 7. The index of non-diversification in SSA groups is higher than in the respective comparison groups and rises steadily over time. The increase in non-

diversification between 1994 and 1985 is statistically significant for all SSA groups but the middle income and the more industrialized countries.

**Table 7 - Structural transformation**

| | 1980 | 1985 | 1990 | 1994 |
|---|---|---|---|---|
| **NDIV** | | | | |
| (i) SAP countries | 17.533 | 18.083 | 18.213 | 18.550 |
| | (11.38)** | (10.44)** | (9.88)** | (10.32)** |
| SAP SSA | 6.467 | 7.199 | 8.811 | 9.268 |
| | (2.70)** | (2.68)** | (3.08)** | (3.32)** |
| (ii) EIAL developing countries | 15.569 | 18.046 | 17.662 | 17.285 |
| | (11.30)** | (8.28)** | (6.96)** | (7.88)** |
| EIAL SSA | 6.042 | 4.932 | 8.461 | 8.838 |
| | (2.80)** | (1.45) | (2.13)* | (2.58)** |
| (iii) Low income SAP countries | 25.320 | 20.600 | 18.380 | 17.120 |
| | (6.46)** | (4.59)** | (4.23)** | (4.07)** |
| Low income SAP SSA | 0.338 | 6.783 | 9.745 | 12.097 |
| | (0.07) | (1.27) | (1.89)+ | (2.41)* |
| (iv) Middle income SAP countries | 15.484 | 17.421 | 18.168 | 18.926 |
| | (13.20)** | (10.85)** | (8.97)** | (9.66)** |
| Middle income SAP SSA | 4.536 | 2.819 | 6.212 | 5.534 |
| | (1.77)+ | (0.80) | (1.40) | (1.29) |
| (v) Less industrialized SAP | 27.420 | 22.840 | 20.360 | 20.260 |
| | (7,98)** | (5.60)** | (4.90)** | (4.95)** |
| Less industrialized SAP SSA | -3.145 | 2.410 | 7.190 | 7.432 |
| | (-0.77) | (0.50) | (1.45) | (1.53) |
| (vi) More industrialized SAP | 14.676 | 16.800 | 17.541 | 17.906 |
| | (10.49)** | (8.04)** | (7.54)** | (7.79)** |
| More industrialized SAP SSA | 8.024 | 8.633 | 9.392 | 10.627 |
| | (2.22)* | (1.60) | (1.56) | (1.79)+ |
| | **1980-1985** | **1986-1994** | **1986-1990** | **1991-1994** |
| **IGDP** | | | | |
| (i) SAP countries | 20.880 | 21.211 | 20.150 | 22.499 |
| | (14.02)** | (16.88)** | (15.65)** | (15.93)** |
| SAP SSA | -3.102 | -3.925 | -2.761 | -5.491 |
| | (-1.55) | (-2.32)* | (-1.59) | (-2.83)** |
| (ii) EIAL developing countries | 20.418 | 21.999 | 21.161 | 23.088 |
| | (12.05)** | (12.55)** | (12.24)** | (11.67)** |
| EIAL SSA | -2.638 | -4.399 | -3.019 | -6.166 |
| | (-1.08) | (-1.74)+ | (-1.21) | (-2.16)* |
| (iii) Low income SAP countries | 20.187 | 21.269 | 20.409 | 22.345 |
| | (6.74)** | (8.28)** | (7.45)** | (8.16)** |
| Low income SAP SSA | -4.012 | -4.972 | -3.840 | -6.757 |
| | (-1.20) | (-1.75)+ | (-1.27) | (-2.21)* |
| (iv) Middle income SAP countries | 21.084 | 21.195 | 20.079 | 22.542 |
| | (12.79)** | (14.44)** | (13.61)** | (13.40)** |
| Middle income SAP SSA | 2.307 | -0.284 | 0.318 | -0.800 |
| | (0.72) | (-0.10) | (0.11) | (-0.24) |
| (v) Less industrialized SAP | 18.275 | 18.997 | 17.904 | 20.362 |
| | (5.13)** | (7.38)** | (6.13)** | (7.51)** |
| Less industrialized SAP SSA | 0.581 | -1.123 | 0.193 | -2.943 |
| | (0.15) | (-0.39) | (0.06) | (-0.96) |
| (vi) More industrialized SAP | 21.430 | 22.212 | 21.314 | 23.367 |
| | (14.61)** | (13.12)** | (14.12)** | (11.87)** |
| More industrialized SAP SSA | -6.300 | -4.715 | -4.851 | -4.364 |
| | (-2.10)* | (-1.36) | (-1.57) | (-1.08) |

NDIV: index of industrial non-diversification.

IGDP: ratio of investment to GDP.
** Coefficient significant at the 1% level. * Coefficient significant at the 5% level. + Coefficient significant at the 10% level.

Although the index also rises in the non-SSA groups of all programme countries, middle income countries and more industrialized countries, the gap in diversification of SSA groups with respect to the non-SSA groups widens over time in all cases. With the exception of the middle income countries and the less industrialized countries, the gap in 1994 is also statistically significant.

Although on its own the rise in the index of non-diversification is consistent both with the de-industrialization hypothesis and with the alternative hypothesis of efficient industrial restructuring whereby inefficient and high-cost producers - unable to compete - shut down, the level of the index in SSA and the size of the gap with respect to non-SSA countries can only be seen with deep concern.

In 1994, food processing, beverages, tobacco manufactures and textiles accounted for about 50% of total manufacturing value added in SSA. None of the other branches showed shares above 6% (UNIDO, 1995). Such low and decreasing level of industrial product diversification strongly questions the sustainability of the increase in export diversification recorded in SSA.

The level of the investment to GDP ratio in the 1991-1994 period was, with the exception of the more industrialized countries, lower than in 1980-1985 in all SSA groups. By contrast, over the same period, the ratio increases in all non-SSA groups. In 1991-1994 the level of the ratio is always lower than in the respective comparison groups. The gap between SSA and non-SSA countries is statistically significant in the case of all programme countries, the EIAL countries, and the low income countries.

The evolution of the investment ratio over time is not particularly significant without controlling for contemporaneous changes in the efficiency of investment. Indeed, it has often been argued that in programme countries the efficiency of investment has increased dramatically (for example, Corbo and Rojas, 1992). The usual rule-of-thumb for controlling for efficiency changes is by comparing the investment ratio with the rate of output growth. Such comparison for the SSA groups does not reveal any appreciable improvements in efficiency since the investment ratio moves in the same direction as the rate of output growth. The improvement in efficiency in some SSA groups during 1986-1990, namely in the group of all programme countries and the less industrialized countries, is insignificant - since neither the change in investment ratio or the change in the rate of output growth are statistically significant in either group of countries.

In the absence of higher investment efficiency, the fall in the investment ratio in SSA groups is worrying news. Together with increases in the non-diversification index, this does not seem to be a sign of efficient restructuring of an industry gearing up to international competition and may lead to the contraction of an already small manufacturing sector.

It is indicative that SSA has been bypassed by the recent increase in foreign direct investment towards developing countries. Both the amount of the inflow to SSA and the SSA share in total private capital inflows are falling and are far below the levels of the 1980s.

Moreover, the foreign investment that took place has concentrated in oil exporting countries, Angola and Nigeria in particular (UNIDO, 1995). Although this study did not attempt a disaggregated analysis of SSA manufactured exports by

commodity, it seems plausible that the only industrial sectors in which SSA will be able to enjoy clear comparative advantage may be those that are based on natural resources (Helleiner, 1992; UNIDO 1996).

## 4. Conclusions

The empirical results clearly highlight the depressed state of manufacturing in SSA programme countries and its poor prospects of an imminent development.

Rates of growth of manufacturing and GDP are dropping to negligible - sometimes negative - levels, manufacturing employment is contracting, labour productivity is declining, there is little evidence of technological transfer - let alone advancement -, industrial non-diversification is continuously increasing, investment and the productivity of investment are stagnant. These indicators show not only a worsening of the situation in 1991-1994 but also that very little progress, if any, has been made since 1980-1985. No SSA group of programme countries seems to have been able to escape this crisis.

Only two indicators are showing an improvement. These are the share of manufacturing in GDP and the share of manufactured exports in total exports. The improvement in these indicators should, however, bring little comfort. It is clear, for example, that such an improvement is of little significance when the rate of growth of manufacturing is almost zero.

Moreover, in a context of severe industrial crisis where investment, productivity and the state of technology are all declining, the improvement in those indicators is not sustainable. This slowed down in the latter period and, in about half of the countries, the manufacturing share of GDP and the export share of

manufactures actually declined during 1991-1994 while the rate of growth of manufacturing value added turned negative.

There are thus the signs of a marginalization of industry in SSA. Industry is stagnating and has become a lagging sector in the economies of SSA. Even according to the World Bank's own criteria (World Bank, 1994) - as described in the section on methodology -, the empirical evidence presented in this paper seems to indicate that SSA is on the brink of de-industrialization. Given the small size of the industrial sector in SSA countries, the present stagnation is likely to have affected the industrial base, thus undermining the capacity of industry to rebound in the future. For some countries, de-industrialization may have already begun.

Are structural adjustment programmes to blame for the industrial decline of Africa? The empirical evidence on the performance of non-SSA programme countries sheds some light on this question, although no causal relationships can be definitely established.

Firstly, non-SSA EIAL countries perform better than the group of all programme countries, which includes the less intensive adjusters. More importantly, in EIAL countries most indicators show a marked improvement during the programme period relative to the period before the programme: the rate of growth of manufacturing value added, of GDP, the share of manufactured exports in total exports, indicators of technological development, labour productivity and the investment to GDP ratio all improved in the SAP period. Often the improvement also occurs in the group of all programme countries.

Not every indicator has moved in the desired direction. In EIAL countries the share of employment in manufacturing, for instance, does not show obvious signs of

recovery. The index of non-diversification increases significantly during programme years, although it fell in 1994. Moreover, the improvement in the indicators listed above seems in many cases to tail off in the later part of the programme years. Overall, however, despite these unintended outcomes, there is certainly no evidence that structural adjustment programmes outside SSA are associated with industrial stagnation.

These observations do not seem to indicate, therefore, that there are faults in adjustment programmes *per se*, i.e. that adjustment programmes everywhere are associated with unintended but inevitable features of industrial decline in programme countries. Rather, it seems that SSA may be different from other contexts and the negative results of structural adjustment programmes in SSA may derive from the failure of programmes to take this 'Sub-Saharan dimension' into account. A striking result of the empirical analysis conducted in this paper is that the performance gap with respect to the relative non-SSA comparison groups of both EIAL and all programme countries has widened over time, almost always significantly.

It has been suggested that industrial development in SSA is more difficult than elsewhere because SSA has poor infrastructure (both physical and institutional), insufficient human capital and entrepreneurship, small and fragmented markets (Lall, 1992; UNIDO, 1996). The empirical evidence presented here seems to support the view that, in this context, SAPs may sometimes be in contradiction with the long-run objective of building up dynamic comparative advantage in industry. Better governance, political stability and a re-orientation of priorities towards the provision by the state of public goods (including infrastructure, institution building and

education) seem to be - together with economic stability - minimum requirements for the reversal of industrial decay in SSA (Stewart *et al.* 1992; UNIDO, 1996).

The final observation of this paper is that these conclusions should be treated with caution. Cross section studies such as this inevitably gloss over differences within groups and individual country characteristics. It is important, therefore, that cross section studies be complemented with case studies of particular countries.

## Appendix A

*Definition of variables and sources of data*

MVAg : rate of growth of real manufacturing value added. Computed from the real manufacturing value added in US$ obtained from the World Bank's World Development Indicators 1997 CDROM (WB CD97).

GDPg: rate of growth of GDP. Source: WB CD97.

MANGDP: ratio of manufacturing value added to GDP. Computed from the data on both variables, in real terms, obtained from WB CD97.

MANX: ratio of manufacturing exports to total exports. Source: WB CD97.

MANLF: ratio of manufacturing employment to total labour force. Source: UNIDO 1996 and WB CD97.

MVAL: real manufacturing value added per worker. Computed from the data from WB CD97 and UNIDO 1996.

MTIM: ratio of imported machinery and transport equipment to total imports. Source: WB CD97.

MTVA: ratio of value added in production of machinery and transport equipment to total manufacturing value added. Source: WB CD97.

NDIV: index of industrial non-diversification. Source: UNIDO 1996.

IGDP: ratio of investment to GDP. Source: WB CD97.

**Appendix B**

The following table provides various classifications used in this study. An entry of 1 for a country indicates the presence of that country in the group.

| Country | Low-Income | EIAL | Less Industrial-ized(1) |
|---|---|---|---|
| Argentina | | | |
| Bangladesh | 1 | | 1 |
| Bolivia | | 1 | |
| Brazil | | 1 | |
| Burkina Faso | 1 | | |
| Burundi | 1 | | 1 |
| Central African Rep | 1 | | * |
| Chad | 1 | | |
| Chile | | 1 | |
| China | 1 | | |
| Colombia | | 1 | |
| Congo | | | 1 |
| Costa Rica | | 1 | |
| Cote d'Ivoire | | 1 | 1 |
| Ecuador | | | |
| Gabon | | | 1 |
| Gambia, The | 1 | | 1 |
| Ghana | 1 | 1 | 1 |
| Guinea | 1 | | * |
| Guinea-B | 1 | | * |
| Honduras | | | 1 |
| Hungary | | | * |
| Indonesia | 1 | | 1 |
| Jamaica | | 1 | |
| Kenya | 1 | 1 | 1 |
| Korea, Rep. of | | 1 | |
| Madagascar | 1 | 1 | 1 |
| Malawi | 1 | 1 | 1 |
| Mali | 1 | | 1 |
| Mauritania | 1 | 1 | 1 |
| Mauritius | | 1 | |
| Mexico | | 1 | |
| Morocco | | 1 | |
| Nepal | 1 | | 1 |
| Niger | 1 | | * |
| Nigeria | 1 | 1 | 1 |
| Pakistan | 1 | 1 | 1 |
| Panama | | | * |
| Philippines | | 1 | |
| Senegal | | 1 | 1 |
| Sierra L | 1 | | 1 |
| Somalia | 1 | | 1 |
| Sudan | 1 | | 1 |
| Tanzania | 1 | 1 | 1 |
| Thailand | | 1 | |
| Togo | 1 | 1 | 1 |
| Tunisia | | | |
| Turkey | | 1 | |
| Uganda | 1 | | 1 |
| Uruguay | | | |
| Zaire | 1 | | 1 |
| Zambia | 1 | 1 | |
| Zimbabwe | | | |

(1) An asterisk indicates non-availability of data.

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## Notes

[1] Persistence is required in order to distinguish de-industrialization from temporary restructuring.
[2] In the following analysis of industrial performance we think it more appropriate to correct for cross-country differences in the weight of intermediate inputs and concentrate on value added rather than gross output measures.
[3] The sources of data are in Appendix A.
[4] UNIDO's name for this index is "degree of specialization". We think that this is a misnomer and prefer to call it "degree of non-diversification". The index is defined as follows:
$h = 100\left(1 + \sum_i s_i \times \ln s_i \,/\, h_{\max}\right)$ where $s_i$ is the share of the *i*-th branch in total manufacturing value added and $h_{\max}$ is the natural logarithm of the number of branches. If the shares of all branches are equal, the index equals 0. If only one branch exists, the value is 100 (UNIDO, 1996).
[5] The inclusion of 1980 is to allow us to use the UNIDO data for some of the selected indicators. Similarly, the end date of the sample period has been determined so as to coincide with the latest available date for the UNIDO data (see footnote 6 for details).
[6] The data for manufacturing employment and industrial non-diversification published by UNIDO refer to the years 1980, 1985, 1990, 1994. The empirical results pertaining to these variables should, therefore, be interpreted with caution as they may be distorted by random fluctuations. The relevant tables clearly indicate if the results refer to period averages or single-year observations.
[7] Furthermore, within the framework of cross sections, where response lags are treated as uniform across countries, the use of period averages may be seen as a way to allow response lags of different lengths to be reflected to some extent in the data.
[8] To our knowledge, this comparison has not been carried out in other empirical studies of the effectiveness of SAPs.
[9] Countries were excluded from the sample only due to unavailability of data.
[10] These are countries that, having borrowed from the World Bank more extensively and for longer periods than other programme countries, are expected to have adjusted their economies to larger extent than other programme countries. The classification of countries as EIAL or programme countries follows World Bank [1990; 1992b].
[11] The decision to use the level of income as one of the categories with which to classify countries derives from the observation that the patterns of industrialization evolve with income growth (Chenery and Syrquin, 1986). The classification of countries as low or middle income follows World Bank [1989].
[12] The list of countries in the sample and their classification is reported in Appendix B.
[13] We have classified countries as less industrialized if their manufacturing share in GDP was less than 15% in 1980-1985. The choice of the 15% threshold is arbitrary but was made with the purpose of maintaining a minimum size for the samples of SSA and non-SSA less industrialized and more industrialized countries.
[14] The significance of mean changes in SSA countries across periods is tested by means of standard *t*-tests.
[15] Although the average share for the SSA more industrialized countries appears to have increased in 1991-1994 relative to 1986-1990, if a correction is made for the number of countries with available data in the two periods, the average turns out to be unchanged.
[16] To be precise, the share remains constant between 1990 and 1994 in the group of more industrialized countries. In these countries too, however, the share dropped continuously between 1980 and 1990.
[17] Caution is required, however, in comparing the evolution of these two indicators since data on the share of machinery and transport equipment in total imports are period averages while data on labour productivity are single-year observations.