EXPORT EARNINGS INSTABILITY OF ACP COUNTRIES : A TIME-SERIES ANALYSIS

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Abstract

This paper examines the level of export earnings instabilities of ACP countries (African, Caribbean and Pacific states signatories of the Lomé Convention) ; their evolution through time and across countries. At present, this group comprises of seventy developing countries. This deliberate choice of the sample was done in order to examine whether fluctuations in export earnings of these countries have relatively decreased as envisaged by the STABEX system, of the Lomé Convention, introduced in 1975 by the European Economic Community. The country coverage of previous studies on export earnings instabilities was generally limited and most of the ACP countries have been rather ignored. Therefore, instability indices for merchandise exports were computed for a total of thirty-nine ACP countries over the periods 1970-1979, 1980-1990 and 1970-1990. The results of the study indicate that instability indices vary across countries. Moreover, a comparison of the indices for 1970-1979 and 1980-1990 reveals that for more than half of the countries in the sample (21), there was a reduction on the level of export instability between the two periods whereas for fifteen countries the reverse was true. It was only for three countries that instability indices remained the same between 1970s and 1980s.

1. INTRODUCTION

There is a growing literature that attempts to explain the economic impact of export earnings instabilities on the economies of Less Developed Countries (Coppock 1962 and 1977, Demeocq and Guillaumont 1986, Knudsen and Parnes 1975, MacBean 1966, Love 1987). However, no firm and general conclusion emerges from empirical studies about the effects of export instability on development. There are two types of empirical studies on export earnings instabilities: cross-country studies; and specific country studies

The former analyses export earning instability (its causes and/or consequences)

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among several countries and the latter focus on individual country studies. In general, cross-country studies do not take into account the specific conditions in each country and their results do not provide relevant information for a particular country included in the sample. Indeed, effects of export instability depend on economic policy reactions, which differ among countries; cross-country studies would then be inadequate to give economic and policy recommendations for any country under consideration[1]. Despite these anomalies cross-country studies helped to produce empirical evidence on the relationships between structural economic variables and export instability. They were also quite useful in revealing variations, in export instability levels, among different groups of countries and commodities. In the same line, Demeocq and Guillaumont (1986:2) argue that cross-section analysis may evidence some effects of export instability distributed over time even more easily than a specific country time-series analysis. However, specific country studies have the advantage of focusing on the specific reaction of countries to instability. This study was carried out on country by country basis. The specific objectives of this paper are: to compute export earnings instability indices for each country in the sample and to compare them across countries and sub-periods; and to investigate whether there are relationships between higher levels of export earnings instability and degrees of reliance on few export commodities.

The rest of the paper is organised in three sections. Section 1 deals with the methodology used in the study where the study period, countries included in the sample, definition of terms and instability measures are discussed. Section 2, presents the results of the study including some comments on the statistical results. The final section summarises the main empirical findings and draws appropriate conclusions.

2. METHODOLOGY

1.1. Data Coverage

Almost all studies on export earnings instability deal with periods ending before 1980; they, therefore, do not take into account the instabilities of the 1980s. This study covered 20 years, from 1970 to 1990. For most of the ACP countries consistent and reliable data on merchandise export values in US dollars are available only for the period beginning in 1970. Therefore, the absence of data on merchandise export earnings for many of the ACP countries, for the years before this period, rules out the possibility of extending the study period before 1970. As data on services exports were not available on consistent basis for many of the countries in the sample, in this study, merchandise export values were used to compute the instability indices[2].

With regard to the methodological approach, the analysis of export instability would be first made for the whole period (1970-1990) and then repeated by splitting it into two sub-periods (1970-1979 and 1980-1990). The two sub-periods are associated

with recognised phases of world economic activity. The early 1970s mark the beginning of unexpected and unprecedented large swings in the commodity prices including two oil crises. Although the latter produced a new group of rich developing countries, the non-oil exporting developing countries were severely affected by their mounting oil import bills and faced balance of payments problems. As the seventies proceeded, the oil crises and the glut of petrodollars resulted in massive commercial loans by financial institutions to many of the ACP countries. With regard to the situations in the 1980s, many ACP countries had been hard hit with the collapse of commodity prices, deterioration of their terms of trade and the debt servicing difficulties. These conditions had forced them to implement economic structural adjustment programs which, in turn, were believed to bring about substantial reduction in imports, devaluation of the national currencies and expansion of exports.

The analysis of the level of instability through different sub-periods helps, therefore, to examine any possible changes in the stability of foreign exchange earnings of the countries in the sample because for many of these countries export earnings are their only source of foreign currency. The foregoing discussions make it clear that the effects of export instability on the economies of the countries in the sample would be different in the 1970s and 1980s because of the higher possibility of resorting to foreign financing during the 1970s.

1.2. Country Sample

Data availability constrained the sample size. Due to lack of sufficient information on export earnings of thirty-one ACP countries over the period 1970-1990, they could not be included in the study. Thus, instability indices were estimated for only thirty-nine ACP countries[3]. The data used are derived from the International Monetary Fund (IMF) trade statistics for they are the sole sources which provide data both on the total export earnings and the receipts from major export commodities denominated in US dollars.

1.3. Definition and Measure of Instability

Instability has been defined in many ways. It is generally accepted now that instability must be defined relative to a 'normal' value. This approach involves equating trend values with the 'normal' or anticipated path of earnings and regarding deviations from trends as comprising instability (Love 1990:325).

At present, there is a consensus among researchers (Cuddy and Della Valle 1978, Erb and Schiavo-Campo 1969, Glezakos 1973 and 1983, Kenen and Voivodas 1972, Leith 1970, Love 1985, Massell 1964 and 1970, MacBean 1966, Tan 1983, Wong 1986, etc.) to eliminate any trend element from a time series in estimating instability. The removal of the trend is required to avoid interpreting consistent annual increase or decrease as indicating instability. Otherwise, instability, and therefore instability index, of a series with a rapid or even a constant growth rate would tend to be biased

upward (Aggarwal 1982, Cuddy and Della Valle 1978). In fact, for the purpose of measuring instability deviations both above and below the trend line should be taken into account. One can either ignore the difference in signs, and take the average of all the percentage deviations in absolute values or square all the deviations first and then take the square roots of the average of the squared percentage deviations in producing an index of instability.

As to the instability indices used in the previous studies, they generally differ from one study to another[4]. The most frequently used instability indices are: Coppock's log-variance measure; Normalised standard error measure; Semi-log standard error measure; Autoregressive moving average measure; Five-year moving average measure; and Average absolute deviation from the trend[5].

For this study, the average absolute deviation instability index is used. This index is defined as the average of annual percentage differences between observed and calculated (trend) values, disregarding the signs of the differences and expressing them as percentages of the trend values[6]. Unlike most of the indices, this one does not impose *a priori* the same trend form for the export series of all the countries in the sample (Demeocq and Guillaumont 1983:8).[7] This index allows, therefore, to use the best trend (linear or exponential) for each country in calculating instability indices. The absolute value formulation is also reported to modify the effects of outliers while squaring accentuates their influence (FAO 1987:70). Moreover, the average absolute deviation instability index takes into account the relative importance of the yearly changes in export proceeds because it measures instability for any one year as a prcentage of the trend values in that year. Glezakos (1973:672) noted that this index is independent of the size of the trend. This index is frequently used by UNCTAD in its Handbook of International Trade and Development Statistics.

3. STATISTICAL RESULTS

In fitting two-trend forms (linear and exponential) to the export series, the exponential trend provided by far the best fit for the majority of the countries in the sample. Thus, the linear relationship between the logarithms of export earnings and time was significant at the 1% level for ten of the thirty-nine counties in the sample; and at the 5% level for seven of the countries. The relationship was not statistically significant for Ghana, Madagascar, Nigeria, Sierra Leone, Somalia, Sudan, Tanzania and Zambia.

For fourteen countries, Burkina Faso, Camercon, Central African Republic, Côte d'Ivoire, Ethiopia, Gambia, Haiti, Malawi, Mali, Papua New Guinea, Senegal, Togo, Uganda, and Zaïre, the linear trend form provided by far the best fit. The linear relationship was significant at the 1% level for Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Ethiopia, Gambia, Haiti, Malawi, Papua New Guinea, and Senegal, and this relationship was not significant for Uganda.

A point of interest regarding the econometric results reported in Table 1 is that except for Benin, Gambia, Malawi, Tonga, Uganda and Zaïre where the estimation by the method of Ordinary Least Squares (OLS) did not show autocorrelation of the error terms, in all other cases the Prais-Winsten transformation was applied in order to calculate the respective trends and coefficients.

Table 1 shows that in fitting two-trend forms to the export series of different countries, in nine of the thirty-nine countries in the sample both the exponential and the linear forms, particularly the latter, did not fit the data well. For a more formal verification of the appropriate trend which may 'fit best' to the data, it was found logical to compare, for each country, the relatively better trend indicated in Table 1 with curves for actual export earnings and the one calculated using five years moving average method. A careful visual inspection of the different curves for the nine countries indicates that the five-year moving average trend form provides by far the 'best fit'. It was noted, however, that in the process of averaging, four terms were lost (two in the beginning and two in the end). Moreover, in using moving averages one should be alert to the fact that the length of the chosen interval influences the degree of smoothing, and where it is small, the moving average tends to absorb some of the short-term fluctuations possibly causing an underestimation of instability (Aggarwal 1982:63, Kenen and Voivodas 1972:793, Love 1987:6, Stein 1977:280). Love (1987:6) has also noted that the moving average is more strongly influenced by outlying observations than linear and exponential trends. As the moving average method has some anomalies in measuring instability and as one of the objectives of this study was to compare the degree of instability in different countries, it was imperative to fit a trend of the same form for export series of the countries in the sample, albeit, of course, that which best fitted the data for most of them. For the computation of the instability indices, it is in practice necessary to keep uniformity in the trend estimation methods. Hence the trend forms shown in Table 1 were used.

Using the trend forms which provided the best fit for most of the countries considered (Table 1), the instability indices of ACP countries were calculated for the 1970-1990 period and the results are set out in Table 2.

Examination of the instability indices in Table 2 indicates that the countries which have experienced a higher degree of instability over the period 1970-1990 were Nigeria, Rwanda and Western Samoa, followed by Congo, Benin, Haiti, Somalia, Tonga, Niger and Sudan.

In fact, crude oil was the major export product of Nigeria and its share of total export earnings in 1970-1990 was nearly 90%. In the case of Rwanda, coffee constituted almost 65% of the total export revenues. As for Western Samoa, coconut oil contributed about 40% of its total export earnings.

Table 1. Results of Linear Regression between Logarithms of Export Earnings and Time : 1970-1990

Country	Correlation Coefficient	T-VALUE	F-VALUE	Durbin Watson	Level of Significance
Barbados	0.517	2.57	6.59	1.33	**
Benin	0.856	7.51	56.35	1.87	***
Burkina Faso (LIN)	0.884	8.00	64.07	1.59	***
Cameroon (LIN) (a)	0.917	9.18	94.86	1.88	***
Central African Republic (LIN)	0.774	5.18	26.84	1.98	***
Chad	0.713	4.31	18.60	1.97	***
Congo	0.747	4.77	22.77	1.36	***
Côte d'Ivoire (LIN)	0.705	4.21	17.76	1.58	***
Ethiopia (LIN)	0.703	4.19	17.53	1.65	***
Fiji	0.789	5.45	29.71	1.60	***
Gabon	0.582	3.04	9.21	1.34	***
Gambia (LIN)	0.906	9.35	87.40	1.60	***
Ghana	0.342	1.54	2.38	1.40	+
Haiti (LIN)	0.596	3.16	9.96	2.05	***
Jamaica	0.532	2.66	7.10	1.55	**
Kenya	0.559	2.86	8.20	1.94	***
Madagascar	0.428	2.01	4.03	1.80	+
Malawi (LIN)	0.926	10.70	114.42	1.33	***
Mali (LIN)	0.949	12.74	162.39	1.56	***
Mauritius	0.841	6.60	43.57	1.81	***
Mauritania	0.901	8.83	77.92	1.73	***
Niger	0.540	2.72	7.40	1.31	**
Nigeria	0.439	2.08	4.31	1.68	+
Papua New Guinea (LIN)	0.867	7.37	54.33	1.46	***
Dominican Republic	0.499	2.44	5.96	1.52	**
Rwanda	0.499	2.44	5.97	1.92	**
Western Samoa	0.524	2.61	6.83	1.71	**
Senegal (LIN)	0.824	6.16	37.93	1.97	***
Sierra Leone	0.135	0.57	0.33	1.59	+
Somalia	0.241	1.06	0.24	1.59	+
Sudan	0.064	0.27	0.07	1.66	+
Suriname	0.582	3.03	9.21	1.82	***
Tanzania	0.256	1.13	1.27	1.68	+
Togo (LIN)	0.805	5.75	33.01	1.94	***
Tonga	0.751	4.96	24.57	1.68	***
Trinidad & Tobago	0.548	2.78	7.72	1.39	**
Uganda (LIN)	0.073	0.32	0.10	1.34	+
Zaïre (LIN)	0.851	7.06	49.78	1.42	***
Zambia	0.187	0.81	0.65	1.72	+

Source: Calculated from data in IMF, International Financial Statistics, various issues.
LIN in parentheses denotes that the relationship between the two variables is linear.
+ Refers to cases where the trend estimates were not statistically acceptable ;
*** the estimated relationship is statistically significant at 1 % level or better and
** the estimated relationship is statistically significant at 5 % level.
(a) The period covered only 1970-1988.

Table 2. Export Earnings Instability Indices for ACP Countries: 1970-1990 (in percentage)

COUNTRY	INDEX (a)	COUNTRY	INDEX (a)
Nigeria	32	Senegal	17
Rwanda	28	Togo	17
Western Samoa	28	Ethiopia	15
Congo	24	Mali	15
Benin	23	Zaïre	15
Haiti	23	Burkina Faso	14
Somalia	23	Cameroon	14
Tonga	23	Côte d'Ivoire	14
Niger	22	Ghana	14
Sudan	22	Fiji	14
Trinidad & Tobago	20	Jamaica	14
Barbados	19	Kenya	14
Gabon	19	Sierra Leone	14
Mauritius	19	Malawi	13
Uganda	19	Surinam	13
Dominican Republic	19	Madagascar	11
Zambia	19	Mauritania	11
Papua New Guinea	18	Tanzania	11
Chad	18	Central African Rep.	
Gambia	17		

a- The indices were computed after correcting for serial correlation using Prais-Winsten method when appropriate and the countries are arranged in descending order of export earnings instability index.

Source: These indices were calculated from data in IMF, International Financial Statistics, various issues.

The other countries with higher export instability levels derive their foreign exchange earnings from exports of one or two commodities. For instance, Congo, Benin, Somalia and Tonga received more than 50 %, on the average, of their total export earnings from oil, palm products, live animals and coconut oil, respectively. Coffee accounted for almost 30 % of the total export revenues of Haiti. As for Niger, Uranium was the main export item and it accounted for 65% of its total export revenues and Sudan received a considerable part of its export incomes from cotton. It is obvious that the prices of most of these commodities have displayed excessive instability in the 1970s and 1980s.

Countries with low degrees of instability in Table 2 are equally dependent, for their foreign exchange earnings, on few primary commodities. This situation may lead to question the relationship between export earnings instability and the degree of commodity concentration. However, it is noteworthy that the low instability levels in some countries can be explained by the fact that export earnings from all commodities may not fluctuate at the same time and in the same direction. Thus, earning instabilities from some commodities might have been offset by the relative stability of proceeds from other commodities. It goes without saying that lower

instability level does not imply that export earnings instabilities were not harmful for the economic performance of the countries under consideration.

It is also important to note that the countries with high degrees of export instability in 1970-1990 were not the main beneficiaries of the STABEX transfers. This is because STABEX is a commodity specific compensatory financing system, in principle limited to trade flows of mainly agricultural commodities from ACP countries to the European Union market. Hence, transfers are made irrespective of the evolution of total export earnings of the countries. In other words, STABEX transfers can be made even when there is an increase in the total export revenues. In reality, an examination of STABEX operations over the period 1975-1990 shows that 527 transfers, amounting to 2.9 billion ECU, were made to fifty-three ACP countries for shortfalls in earnings from twenty-six commodities. The six main beneficiaries–Côte d'Ivoire, Cameroon, Senegal, Ethiopia, Sudan, Papua New Guinea–received about 55% of total transfers[8].

The measure of instability over a long period can overshadow the nature and degree of fluctuations in the short and medium terms. Moreover, the index computed for the entire period (1970-1990) does not take into account the change in the trend form or a break in the trend which may take place over the study period (Binkley 1987:406, Demeocq and Guillaumont 1985:62, MacBean 1966:365). It was worth, therefore, dividing the study period into different sub-periods in order to understand the nature of export earnings fluctuations in each country and their evolution over time. Towards this end, the trend values and the corresponding instability indices were estimated, for each country in the sample, over the periods 1970-1979 and 1980-1990[9]. As already noted, the "best fit" trend form for each country was selected on the basis of comparison of the coefficients of determination derived from regressions of export earnings against the exponential and linear trend forms[10].

For each Country in the sample, the trend form which was used to compute the instability index is specified (LIN for linear and EXP for exponential).

Table 3 shows that for most of the countries in the sample (21 Countries) export earnings instability declined between 1970-1979 and 1980-1990. For fifteen other countries of the sample, namely Barbados, Benin, Burkina Faso, Chad, Ghana, Madagascar, Malawi, Mali, Niger, Uganda, Sierra Leone, Somalia, Sudan, Surinam and Tanzania, instability increased between the two sub-periods. The instability indices of Ethiopia, Fiji and Western Samoa remained more or less stable over the two sub-periods.

Moreover, for nineteen countries of the sample, namely Barbados, Cameroon, Côte d'Ivoire, Dominican Republic, Ethiopia, Fiji, Kenya, Madagascar, Malawi, Mali, Niger, Rwanda, Somalia, Sudan, Surinam, Togo, Tonga, Uganda and Western Samoa the instability indices computed over the entire period 1970-1990 were greater than the ones computed for each of the two sub-periods. Whereas for twenty other countries,

namely Benin, Burkina Faso, Central African Republic, Chad, Congo, Ghana, Gabon, Gambia, Haiti, Jamaica, Mauritius, Mauritania, Nigeria, Papua New Guinea, Senegal, Sierra Leone, Tanzania, Trinidad & Tobago, Zaïre and Zambia the instability indices for the period 1970-1990 were less than or equal to the indices for the sub-periods.

Table 3. Export Earnings Instability Indices of ACP Countries : 1970 - 1979 and 1980-1990 (in percentage) [a]

	Indices			Indices	
Country	1970-1979	1980-1990	Country	1970-1979	1980-1990
Congo	50 LIN	13 LIN	Burkina Faso	12 LIN	17 LIN
Nigeria	43 LIN	28 LIN	Barbados	11 EXP	17 EXP
Trinidad and & Tobago	34 LIN	11 LIN	Central African Rep.	11 EXP	6 EXP
Gabon	34 LIN	16 EXP	Niger	11 EXP	13 LIN
Haiti	26 EXP	11 LIN	Uganda	11 EXP	17 EXP
Senegal	25 EXP	7 EXP	Sudan	11 EXP	19 LIN
Mauritius	21 EXP	20 LIN	Côte d'Ivoire	10 EXP	8 LIN
Gambia	20 EXP	11 EXP	Ethiopia	10 LIN	10 EXP
Papua New Guinea	20 LIN	10 LIN	Ghana	10 LIN	16 LIN
Rwanda	20 EXP	11 EXP	Cameroon	9 EXP	8 EXP
Zaire	20 EXP	9 EXP	Kenya	9 EXP	8 LIN
Zambia	20 EXP	16 LIN	Sierra Leone	9 EXP	14 LIN
Tonga	19 EXP	17 LIN	Somalia	9 LIN	20 LIN
Western Samoa	18 EXP	18 EXP	Mali	8 EXP	10 EXP
Togo	16 EXP	12 LIN	Benin	6 LIN	33 EXP
Dominican Republic	15 LIN	12 LIN	Madagascar	6 EXP	7 LIN
Jamaica	14 EXP	13 EXP	Malawi	6 EXP	12 LIN
Mauritania	14 EXP	7 EXP	Tanzania	6 LIN	11 LIN
Chad	14 EXP	18 EXP	Surinam	4 EXP	11 EXP
Fiji	13 EXP	13 EXP			

(a) The indices are computed after correcting for autocorrelation when appropriate.
Source: Computed from data in IMF, International Financial Statistics, various issues.

A review of the literature on export earnings instability reveals that there is no as such a threshold instability index below which export earnings fluctuations are not harmful to the economy of a given country. This fact makes it very difficult to regroup the thirty-nine countries in the sample into different categories according to the degree and period of instability.

Inspection of the instability indices in the period 1970-1979 indicates that the first four countries (with higher degrees of instability) are petroleum exporters and they had experienced considerable fluctuations of their export earnings as the result of the

oil price 'shocks' in the 1970s. Moreover, it is interesting to note that in these countries crude oil accounted for the lion's share of their foreign exchange earnings and increase (decrease) of oil prices had a considerable impact on the total export earnings of the countries concerned.

Over the study period, crude oil accounted for more than half of the export receipts of Congo and these receipts were multiplied by 2.8 and 1.5 between 1973 and 1974 and 1978 and 1979, respectively[11]. Crude oil was also the predominant source of Gabon's export earnings accounting for more than 70% of the total exports which were multiplied by 2.52 and 1.57 between 1973 and 1974 and 1978 and 1979, respectively. In 1970-1990, crude oil's share in Trinidad & Tobago's export revenues was close to 80% and the total export proceeds of this country were respectively 3.04 and 1.3 times higher in 1974 and 1979 than in 1973 and 1978. Nigeria's dependence on crude oil exports is considerable compared to the other three countries. Crude oil provided about 90 percent of the total export earnings and between 1973 and 1974 these receipts were multiplied by 2.5 whereas between 1978 and 1979 they were multiplied by 1.6.

In a nutshell, the above results are in complete agreement with the widely spread conventional view that high degree of dependence on few primary commodities, whose prices are subject to extreme fluctuations, is associated with considerable variations in export earnings.

3.1. Scope and Implications of the Statistical Results

Unlike the cross-country studies where assumptions are made about the relative homogeneity of the countries studied and conclusions are drawn for a group of countries, in this study export instability was analysed at the level of individual ACP countries. It should be noted that export earnings instability of a given country reflects fluctuations in export proceeds, caused by country-specific factors, which call for appropriate policy responses adapted to the circumstances of the country in question.

The results of this study reveal that countries which rely heavily on the exports of few primarily commodities, whose prices are beyond their control, experience higher levels of fluctuations in their export earnings. This does not mean that excessive dependence on export of few primary commodities is the sole explanation for export instability. Other determinants of export instability include: geographical concentration in the export sector; commodity concentration; export market share; domestic consumption ratio; and the proportion of raw materials and food items in the total export receipts, etc. With regard to the results of empirical studies on the relationships between export instability and the above factors, they have been contradictory and non-conclusive. Concerning the effects of export instability, it is said to be harmful to the economies of developing countries, presumably by affecting

negatively, economic growth rate (through its effects on the volume of capital goods to be imported, which is partly a function of stable export earnings), foreign capital inflow, volume of investment, domestic saving rates, government revenue, public expenditures, etc. Like for the causes of export instability, no firm and general conclusion emerges from the literature about the effects of export instability on development[12].

This article does not analyse the sources of export instability nor does it measure its effects on the economies of the countries in the sample. This is an entirely different question and it is not the one addressed in this study. However, it is worth-noting that because of the country-level nature of the study and the inter-country comparison of the findings, any study on the causes and consequences of export instability would call for the utilisation of data extracted from the same source for all countries in the sample. Otherwise, the use of data gleaned from various sources could lead to erroneous conclusions for the quality and reliability of data differ from one source to another. In fact, because of the impossibility of getting data for many countries from the same source on the various factors which contribute to export instability and the economic variables which it affects, empirical studies on the causes and consequences of export instability are in general country-specific as well as few and far between. Moreover, the results are seldom comparable. Although the results of this study shed light on the levels of export instability in the countries studied, further research needs to be undertaken at the level of individual countries so as to examine the causes and consequences of instability.

4. CONCLUSION

This paper has examined the export earnings fluctuations of thirty-nine ACP countries, each of which was heavily dependent on primary product exports, over the period 1970-1990. The statistical results obtained indicate that for more than half of the countries in the sample, export proceeds were more unstable in the 1970s than in the 1980s. This evidence strongly supports, therefore, the conventional view that heavy reliance upon a single commodity for foreign exchange earnings can be troublesome in its destabilising effects on the total export proceeds. It is also clear from Table 3 that during the first sub-period, countries with higher degrees of instability were exporters of crude oil. However, over the second sub-period, the level of instability was equally important for countries exporting oil and non-oil products.

Finally, it is worth-noting that as the objective of this paper was limited to the evaluation of the degrees of export earnings fluctuations, their evolution through time and across countries, the statistical results do not tell much neither about the cause of export instability nor about its effect on economic performance of the countries in the sample.

NOTES

1 On the inconveniences caused by cross-country studies on export earnings instability, see for example Love 1986, Massell 1970.

2 The quasi-totality of the studies on export instability made use of merchandise export data. To the best of the author's knowledge, the only study which analysed the instability of services exports is the one made by Sinclair and Tsegaye (1990). Erb and Schiavo-Campo (1969), Coppock (1977) and Knapman and Schiavo-Campo (1983) have also studied the instability of exports of goods and services. In general, services have not been considered in instability studies on the ground that the types and qualities of services exported show considerable variation from one country to another. Moreover, the geographical destinations of services exports are not reported for many countries.

3 The countries in the sample were: Barbados, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Dominican Republic, Ethiopia, Fiji, Gabon, Gambia, Ghana, Haiti, Jamaica, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Niger, Nigeria, Papua New Guinea, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Surinam, Tanzania, Trinidad & Tobago, Togo, Tonga, Uganda, Western Samoa, Zaïre and Zambia.

4 For a detailed discussion of the different instability indices, see Love 1987: 5-12, Demeocq and Guillaumont 1983:8-9.

5 As to the effects of the choice of instability index on the results and conclusions of cross-country studies, we find contradictory reports: some authors (Coppock 1962, Demeocq and Guillaumont 1985, Erb and Schiavo-Campo 1969, Glezakos 1973, Massell 1964) found significant correlation between different instability indices; for other authors (Kenen and Voivodas 1972, Knudsen and Parnes 1975, Love 1990, Lam 1980) the method of measuring export instability does not seem to matter very much; finally, some authors (Glezakos 1983, Glezakos and Nugent 1983, Leith 1970, Sinclair and Tsegaye 1990, Tan 1983) reported that the choice of the instability index has a significant effect on the results of cross-country studies.

6 The Average Absolute Deviation Instability index (AAD) is computed by using the following formula:

$$AAD = \frac{100/n \sum_{i=1}^{n} (X - \hat{X})}{\hat{X}}$$

here:

X and $\hat{X}$ are actual and trend values in period t.

n is the number of years considered in the study.

7 For a description of the inconveniences of a priori choice of the form of the trend, see Tan 1983: 220.

8 For more information on the principal beneficiaries of the STABEX transfers, see Delahousse 1993.

9 The length of the time-series is relatively short. However, it is interesting to note that in previous studies the number of time periods (years) used to estimate the trend which best

fits the time-series data on export earnings varied from one study to another. Coppock (1977:8), for example, argued that there is no theoretical principle to determine the appropriate number of years and suggested that as a rule of thumb, about a decade would seem sensible. In practice, the availability of reliable and consistent data, particularly in earlier studies, did indeed constrain the coverage to around ten years and, while there has been some variation, such a period tended to become the tacit convention (Love, 1987:9).

10 Additional information on the regression results for the two sub-periods is available from the author on request.

11 Figures on the contribution of crude oil to the total export earnings of Congo, Gabon, Nigeria and Trinidad & Tobago were computed from data in IMF, International Financial Statistics, various issues.

12 For a detailed explanation of the consequences of export instability and the results of different empirical studies, see Belay 1994:331-345 and Love 1987:11-37.

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