

EBS/86/278

CONFIDENTIAL

December 18, 1986

To: Members of the Executive Board
From: The Secretary
Subject: Indicators of Real Effective Exchange Rates

There is attached for the information of Executive Directors the latest paper in the quarterly series presenting indicators of real effective exchange rates of member countries. The present paper introduces a newly revised and expanded weighting scheme for the nominal and real effective exchange rates for most developing countries and for the smaller industrial countries. All indices have been re-based to 1980=100.

Mr. Knight (ext. 7474) or Mr. Wickham (ext. 7409) is available to answer technical or factual questions relating to this paper.

Att: (1)

INTERNATIONAL MONETARY FUND

Indicators of Real Effective Exchange Rates

Prepared by the Research Department

(In consultation with the Exchange and Trade Relations
Department, Area Departments, and the Bureau of Statistics)

Approved by R.R. Rhomberg

December 16, 1986

This paper presents charts and tables of quarterly data on indicators of real effective exchange rates for member countries. 1/ Beginning with this issue of the report, nominal and real exchange rate indicators for the smaller industrial countries and most developing countries are calculated using an extensively revised and expanded weighting scheme. The new weighting scheme is based on a trade-weighting approach that takes account of both bilateral trade and third-country competition. Furthermore, the commodity coverage has been expanded to include trade in both manufactures and primary products and the trade flows used are averages for the three-year period 1980-82. With these changes, the base year of the indices has also been moved forward from 1978=100 to 1980=100.

These new indices are therefore much more comprehensive in coverage than those published previously in this report. Broadly speaking, however, the revised real effective exchange rate indicators do not diverge markedly from those circulated previously, where the index for many of the developing countries employed weights based only on bilateral trade between the country in question and a "core-group" of 36 countries for which aggregate trade data for 1980 were readily available. 2/ For

1/ It should be noted that the term "country" used in this report does not in all cases refer to a territorial entity that is a state as understood by international law and practice. The term also covers some territorial entities that are not states but for which statistical data are maintained and provided internationally on a separate and independent basis.

2/ See, for example, the Appendix to the report "Indicators of Real Effective Exchange Rates (EBS/86/208) for details of the old method of calculation.

example, in the November update of the Information Notice System (INS), countries that triggered an INS notice on the basis of the new indices would also have done so under the old ones. However, while the real effective exchange rates under the old and revised weighting schemes generally show similar behavior, differences between nominal effective rates using the two weighting schemes can be more pronounced, primarily because of the increased presence of high-inflation countries in the revised weighting schemes for the indices of a number of developing countries. The real effective exchange rates show less divergence because an offset occurs in the behavior of relative price levels. A full description of the methods used for calculating these new indices is provided in the Appendix to this Report.

* * *

Real effective exchange rates are defined as nominal effective exchange rates adjusted for relative movements in local currency price levels between the home country and the rest of the world. The period covered by the indicators extends over several years, in order to permit the examination of changes in a medium-term perspective.

There are various concepts of the real effective exchange rate corresponding to different analytical purposes. For example, such indices may be used as one element in assessing the international competitiveness of particular industries, the export sector as a whole, or the import-competing sector. One may also wish to assess a given country's competitiveness in manufactures separately from that in international markets for primary commodities. Each specific purpose leads to a different method of calculation and yields a different result. In this paper, the focus is on indices that attempt to measure the overall international cost and price competitiveness of each country, which for the smaller industrialized countries and for most developing countries takes both manufactures and primary products into account. Each real exchange rate indicator is defined in such a way that an increase in its level indicates a loss in overall cost and price competitiveness.

Although indicators of a country's overall cost and price competitiveness are a useful input in the analysis of its balance of payments position, many other factors in both goods and capital markets are also important determinants. Since the evolution of the real effective exchange rate has to be interpreted in the context of other economic developments, a change in the real effective exchange rate is not per se a sign that the exchange rate is becoming inappropriate. Conversely, a lack of change is not an indication that it continues to be appropriate. There are also many statistical and conceptual problems involved in the calculation of

these variables. 1/ The present report makes use of readily-available cost and price indicators, so that the indicators can be calculated easily and consistently for a large number of member countries.

As already indicated, the types of indices presented in this paper are described in detail in the statistical appendix, which also sets out the countries for which each index is calculated. The first index, which remains the same as that used in earlier issues of this report, is calculated for 17 industrial countries. It is based on relative normalized unit labor costs adjusted for exchange rate changes. For nearly all other member countries, a revised index has been calculated. This new index replaces the so-called indices II and III used in previous reports. 2/ As with its predecessors, the revised index for the smaller industrial countries and most of the developing countries is based on consumer price indices; the difference between the new and old indices lies in the weighting scheme used for their calculation. The revised weights are built up from a data base which distinguishes between manufactured goods and primary products for each country. Within these broad classes of traded goods, trade in particular manufactures and primary products is identified. Thus it is possible, for example, when considering the competitiveness of a country specializing in the export of a particular group of primary products to assign weights to other countries also exporting these products. With respect to manufactures, trade by product and by market is distinguished in the data base, so that it is possible to make allowance at a disaggregated level for competition in third markets as well as that emanating from bilateral trade links.

For a small number of member countries, it has not been possible to compute new weights. The weights previously used in this series of papers will therefore be retained for these countries. The countries concerned are listed in the statistical appendix.

The attached charts present the results for a selection of 55 industrial and developing countries. The tables that follow give the estimates for all countries, flagging changes in the indicators of real effective

1/ A review of the conceptual problems that arise in the measurement of real effective exchange rates is presented in Edouard B. Maciejewski, "'Real' Effective Exchange Rate Indices: A Re-Examination of the Major Conceptual and Methodological Issues," Staff Papers, International Monetary Fund (Washington), Vol. 30 (September 1983), pp. 491-541.

2/ Beginning with the current exercise, data for two more countries are available: Kiribati and Tonga. The number of countries for which only the nominal effective exchange rate is calculated, owing to unavailability of satisfactory price indices, is currently 26.

exchange rates that are particularly large in a medium-term perspective. The indicators are the same as those used by the staff in the Information Notice System on large changes in real effective exchange rates (see EBS/83/138, 7/6/83). Beginning with the present report, the base period of the indicators has been moved forward to 1980=100, so that they are now identical to those used in the INS. In line with these revisions, the changes that are now flagged are those that exceed 20 percent and 30 percent from the 1980 base period (rather than 1978, as in past reports).

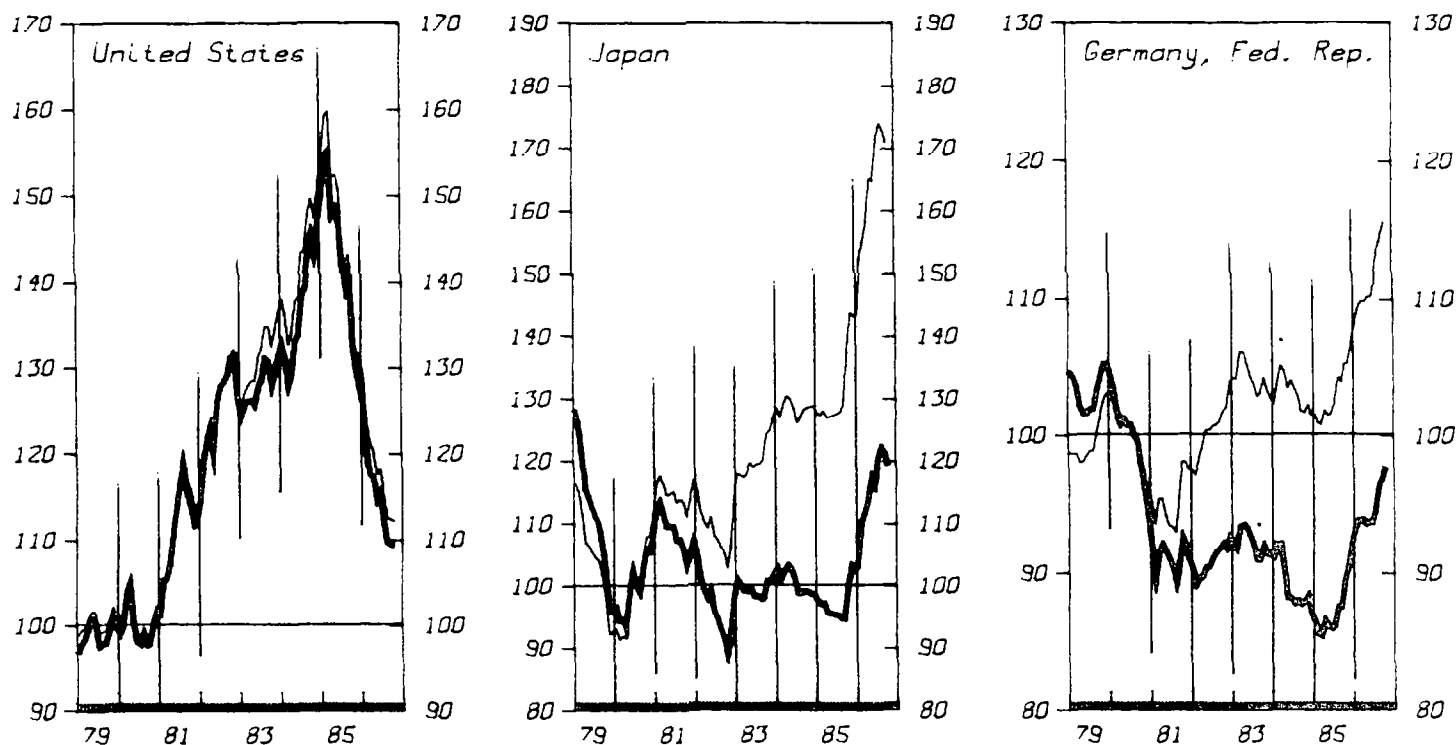
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The staff will continue efforts to further refine the indices as experience is gained. It will also seek improvement in the data in the course of its normal consultations with members.

SEVENTEEN INDUSTRIAL COUNTRIES: NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986 (Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate 1/
(In percent)

	United States				Japan				Germany, Fed. Rep. of			
Terminal	Initial period				Initial period				Initial period			
Period	1978	1980	1982	Q1 85	1978	1980	1982	Q3 85	1978	1980	1982	Q1 85
1980	-0.2				-22.8				-2.3			
1982	24.5	24.8			-25.8	-3.9			-11.2	-9.1		
1983	27.6	27.9	2.4		-23.2	-0.5	3.5		-10.0	-7.9	1.3	
Apr. 1986- Sep. 1986	12.6	12.9	-9.6	-26.4	-8.7	18.3	23.1	25.0	-7.4	-5.2	4.3	10.6
Sep. 1986	8.9	9.2	-12.5	-28.8	-6.7	20.9	25.8	27.8	-5.3	-3.1	6.6	13.1

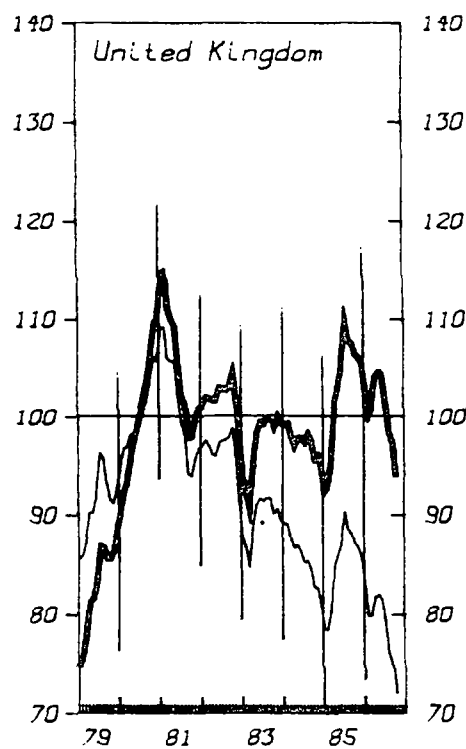
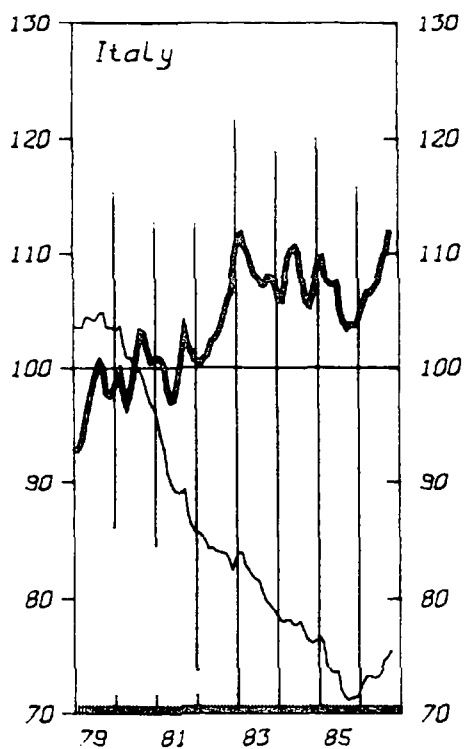
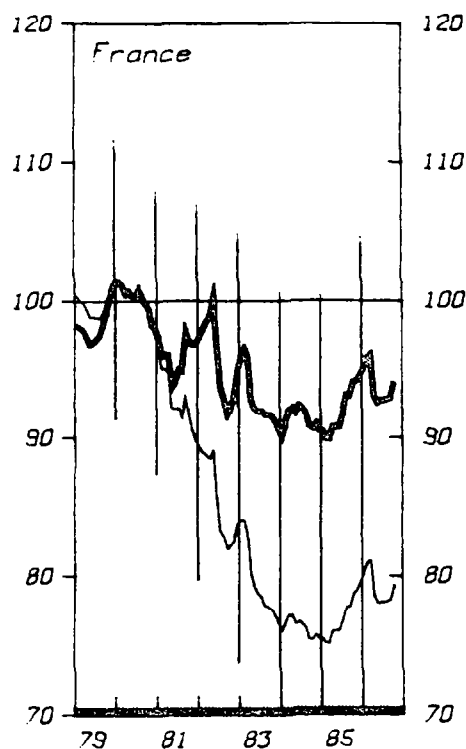
1/ For each terminal period shown in the stub, the table indicates the percentage changes in the real effective exchange rate from the four base periods shown in the heading. The fourth base period corresponds to the last major peak or trough, and differs from country to country. All the data refer to period averages.



SEVENTEEN INDUSTRIAL COUNTRIES: NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986 (Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate
(In percent)

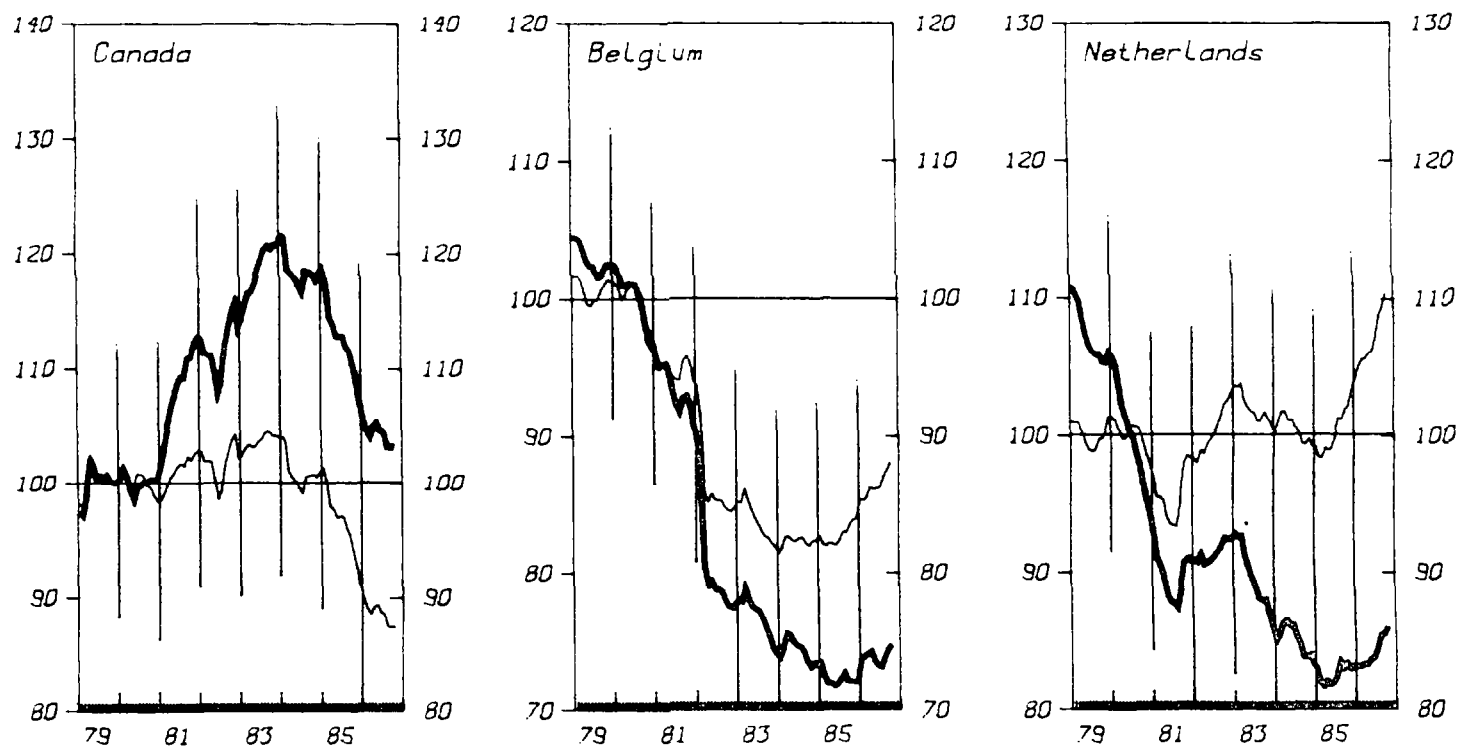
Terminal Period	France				Italy				United Kingdom			
	Initial period				Initial period				Initial period			
	1978	1980	1982	Q1 80	1978	1980	1982	Q2 81	1978	1980	1982	Q1 81
1980	4.6				5.6				38.9			
1982	0	-4.4			9.3	3.5			41.6	2.0		
1983	-2.9	-7.2	-2.9		14.9	8.8	5.1		34.9	-2.9	-4.7	
Apr. 1986- Sep. 1986	-2.9	-7.2	-2.9	-8.2	14.2	8.2	4.5	11.1	41.2	1.6	-0.3	-10.4
Sep. 1986	-2.8	-7.1	-2.8	-8.0	16.4	10.2	6.4	13.1	35.0	-2.8	-4.6	-14.3



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— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate
(In percent)

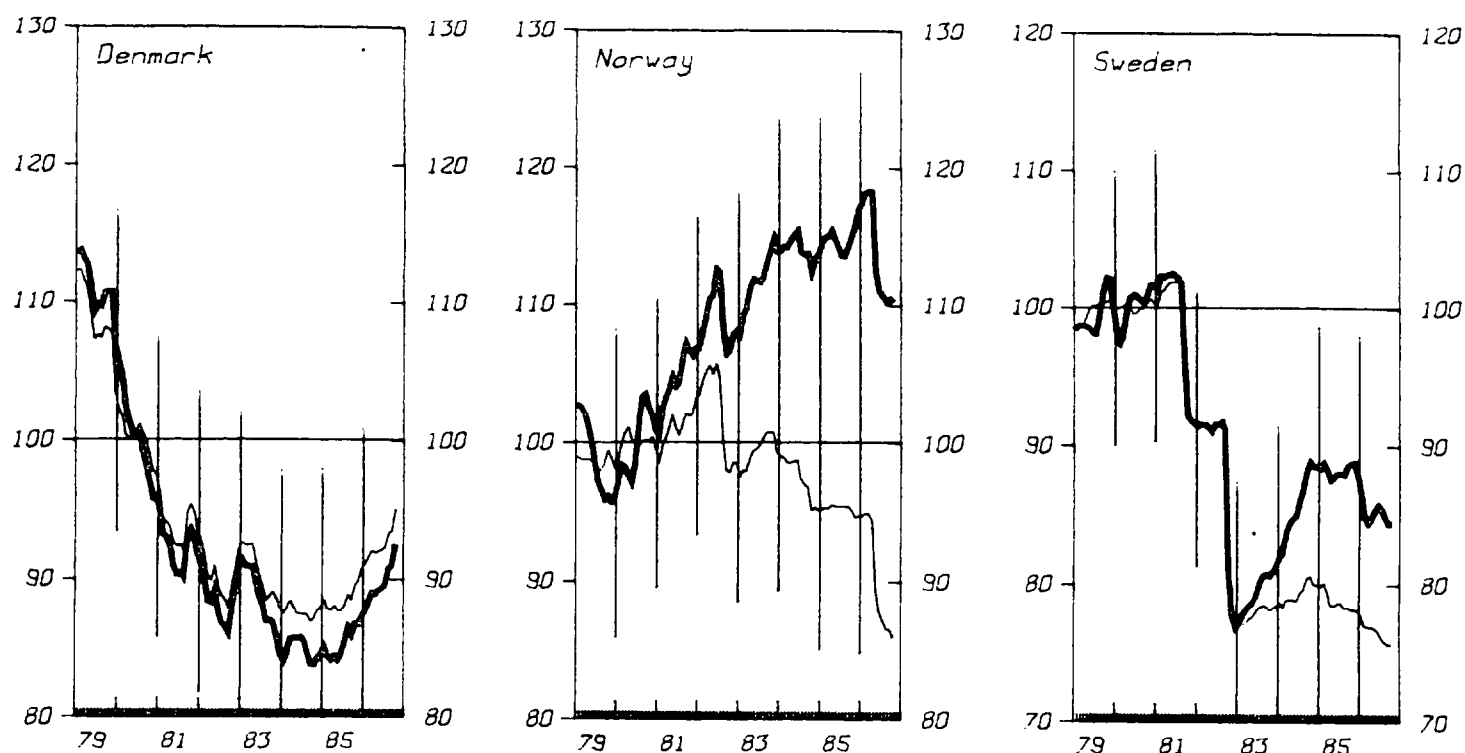
Terminal Period	Canada				Belgium				Netherlands			
	Initial period				Initial period				Initial period			
	1978	1980	1982	Q2 80	1978	1980	1982	Q4 79	1978	1980	1982	Q4 79
1980	-2.3				-5.1				-9.0			
1982	9.2	11.8			-24.0	-19.9			-16.8	-8.6		
1983	15.8	18.5	6.0		-27.2	-23.3	-4.2		-18.5	-10.4	-2.0	
Apr. 1986- Sep. 1986	1.8	4.2	-6.8	-13.5	-30.1	-26.3	-8.0	-28.0	-23.2	-15.7	-7.7	-20.1
Sep. 1986	0.7	3.1	-7.8	-14.4	-29.4	-25.6	-7.1	-27.3	-22.2	-14.5	-6.5	-19.0



SEVENTEEN INDUSTRIAL COUNTRIES: NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986 (Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate
(In percent)

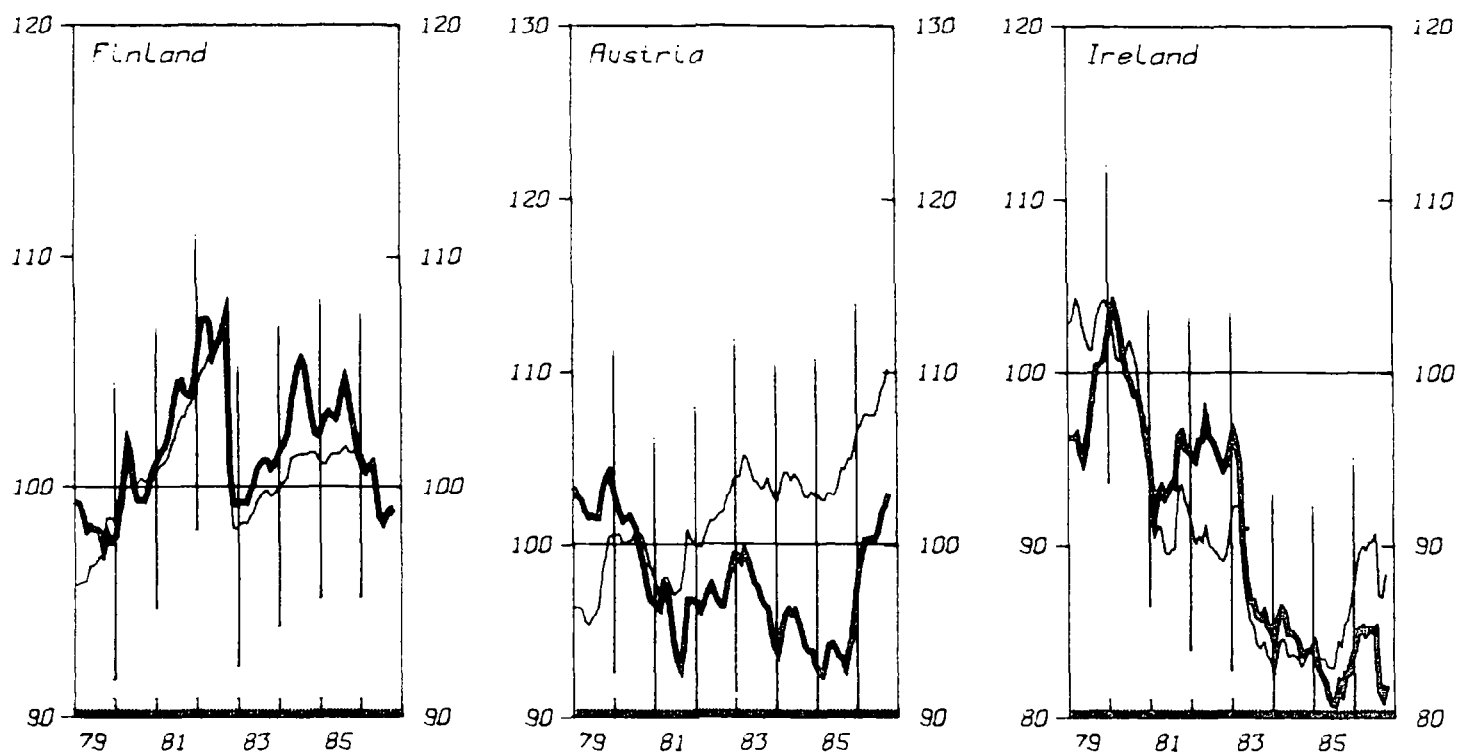
	Denmark				Norway				Sweden			
Terminal	Initial period				Initial period				Initial period			
Period	1978	1980	1982	Q4 79	1978	1980	1982	Q2 82	1978	1980	1982	Q2 81
1980	-10.6				-4.5				-1.5			
1982	-21.0	-11.6			4.1	8.9			-13.2	-11.9		
1983	-20.9	-11.6	0		6.7	11.7	2.6		-21.7	-20.5	-9.8	
Apr. 1986-												
Sep. 1986	-19.7	-10.2	1.6	-17.9	7.1	12.1	2.9	0.8	-16.3	-15.0	-3.5	-17.0
Sep. 1986	-18.7	-9.1	2.9	-16.9	5.5	10.4	1.3	-0.7	-17.0	-15.7	-4.3	-17.6



SEVENTEEN INDUSTRIAL COUNTRIES:
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate
(In percent)

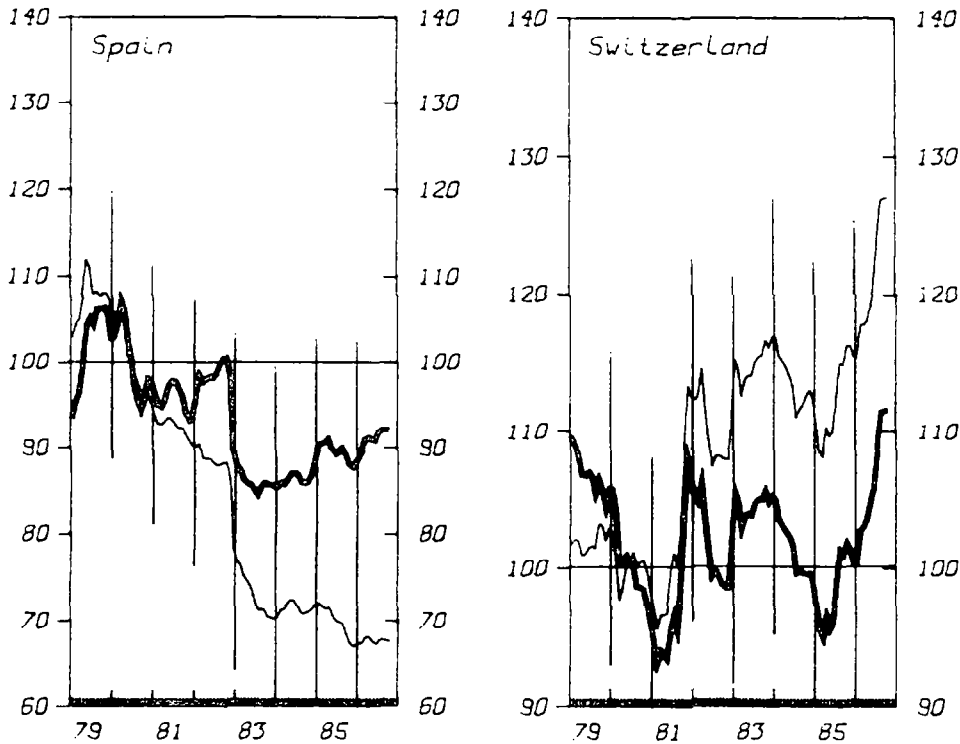
Terminal Period	Finland				Austria				Ireland			
	Initial period				Initial period				Initial period			
	1978	1980	1982	Q1 83	1978	1980	1982	Q4 79	1978	1980	1982	Q2 85
1980	0.6				-5.5				4.4			
1982	5.6	5.0			-8.1	-2.8			-0.2	-4.5		
1983	1.0	0.4	-4.4		-8.0	-2.6	0.2		-7.3	-11.2	-7.0	
Apr. 1986- Sep. 1986	-0.2	-0.7	-5.5	0	-4.6	1.0	3.9	-2.7	-12.5	-16.2	-12.3	3.0
Sep. 1986	-0.5	-1.1	-5.8	-0.4	-3.3	2.3	5.2	-1.5	-15.4	-19.0	-15.2	-0.4



SEVENTEEN INDUSTRIAL COUNTRIES:
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
normalized unit labor costs in manufacturing



Change in Real Effective Exchange Rate
(In percent)

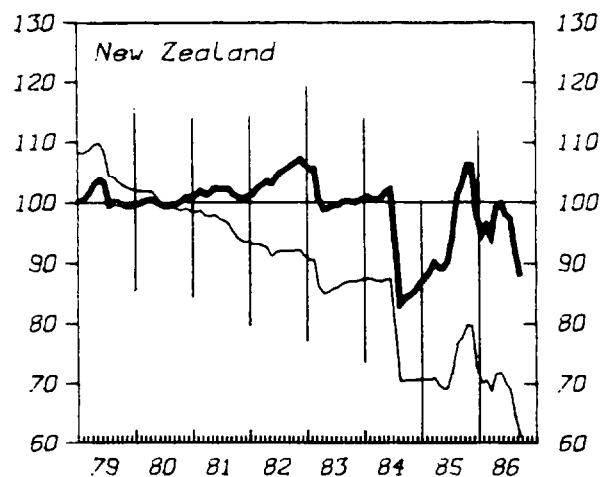
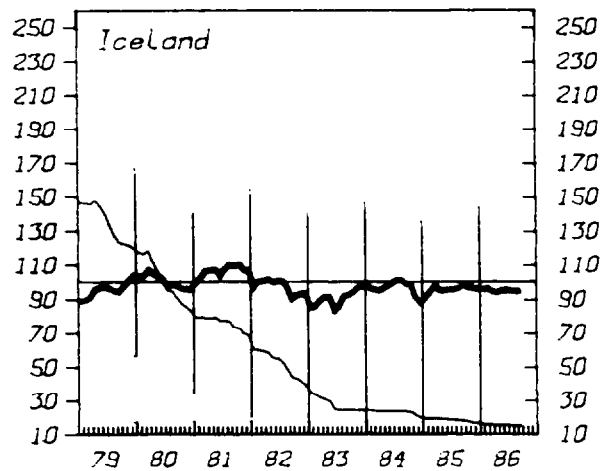
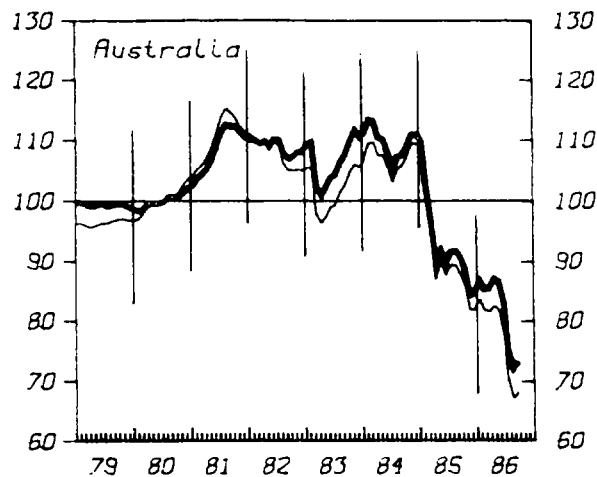
Terminal Period	Spain				Switzerland			
	Initial period				Initial period			
	1978	1980	1982	Q3 79	1978	1980	1982	Q2 85
1980	18.6				-11.1			
1982	15.9	-2.3			-9.9	1.4		
1983	1.7	-14.2	-12.2		-7.1	4.5	3.1	
Apr. 1986- Sep. 1986	8.5	-8.5	-6.3	-13.2	-4.3	7.7	6.3	12.1
Sep. 1986	9.3	-7.8	-5.6	-12.6	-0.9	11.5	10.0	16.1



OTHER INDUSTRIAL COUNTRIES: NOMINAL AND REAL
EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
consumer price indices

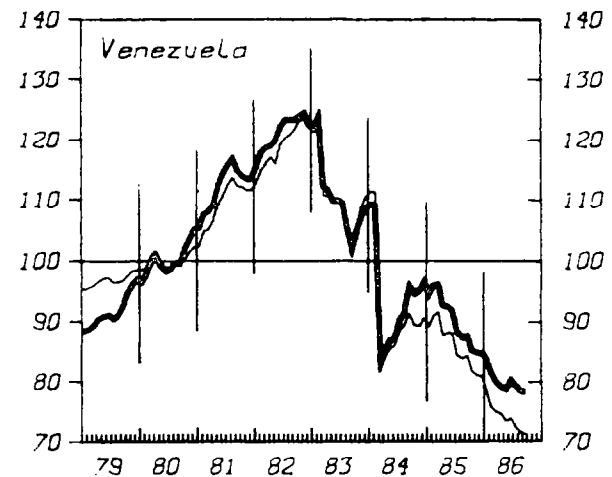
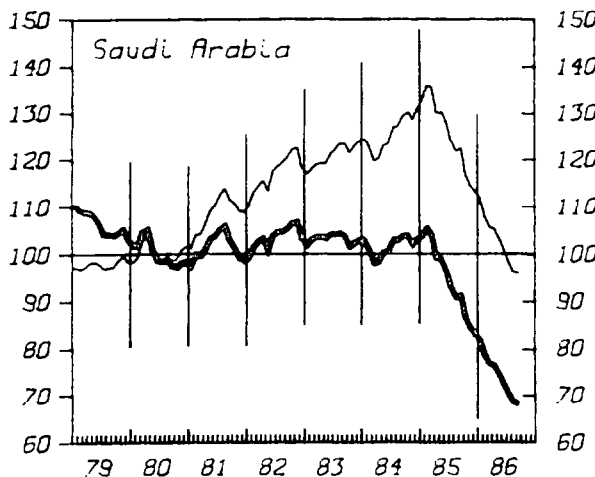
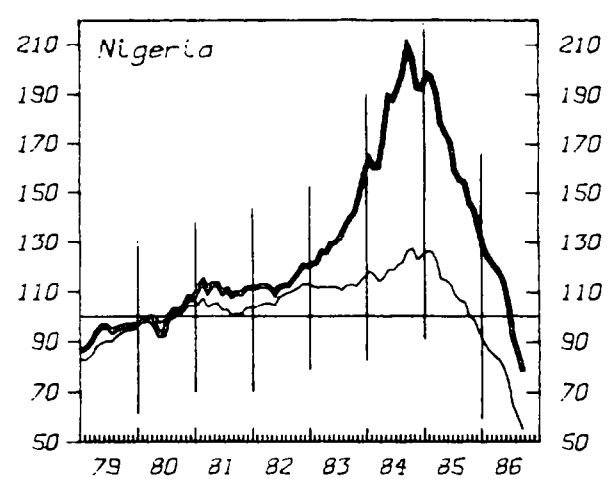
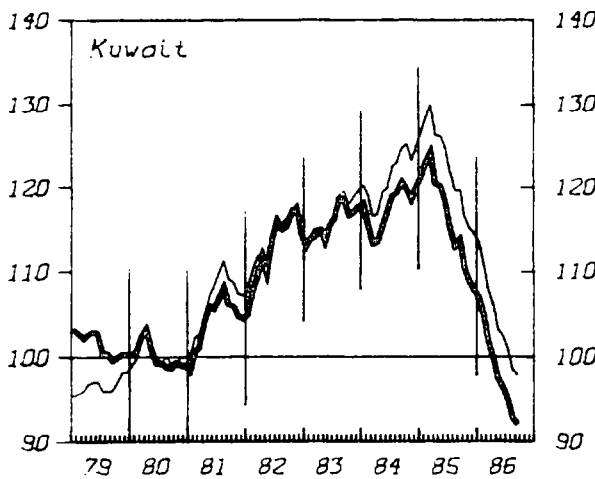
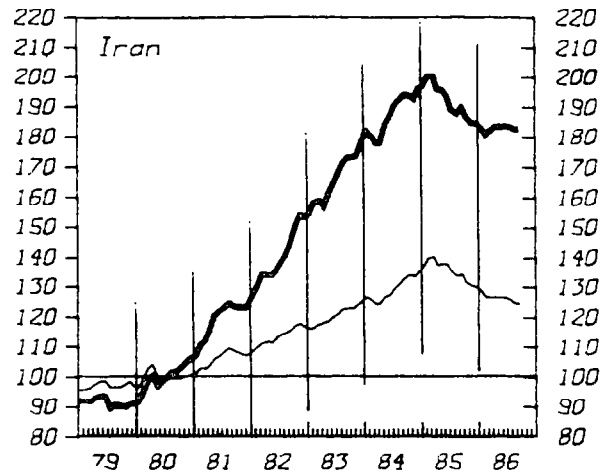
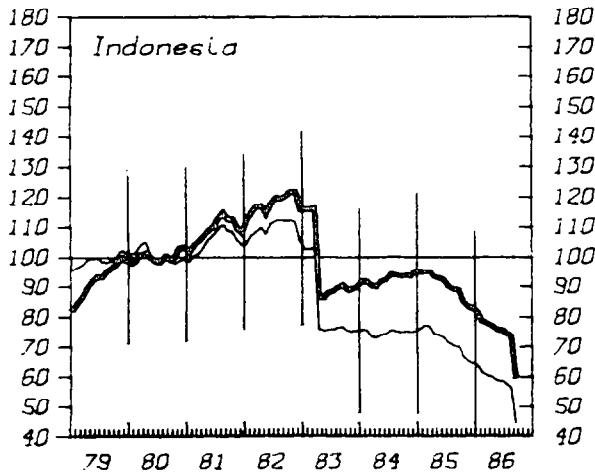




DEVELOPING COUNTRIES — OIL EXPORTING
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES,
1979 – SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
consumer price indices

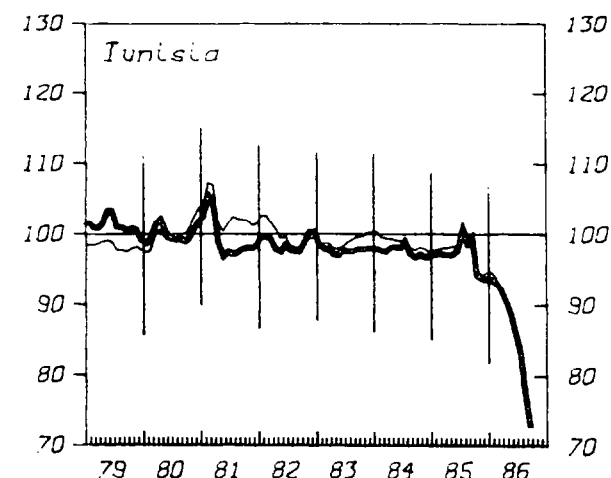
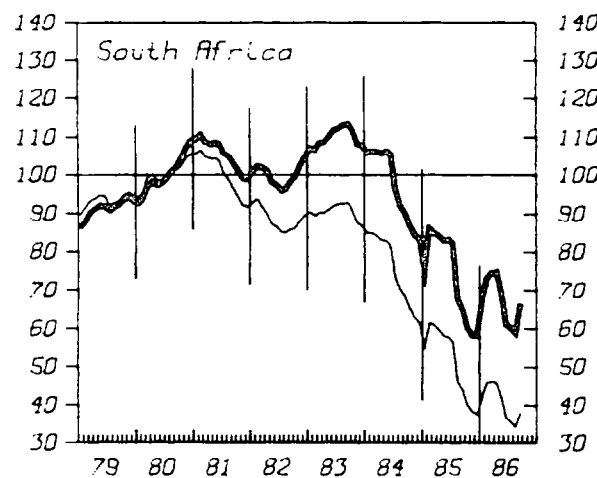
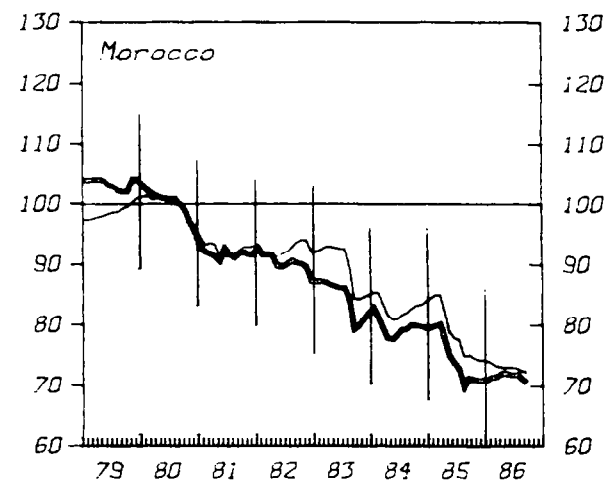
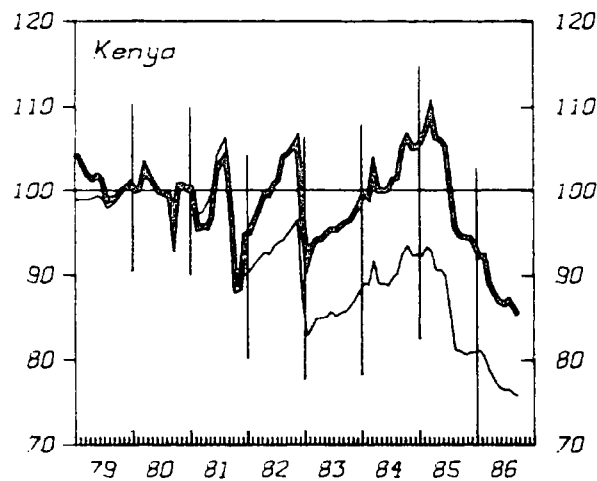
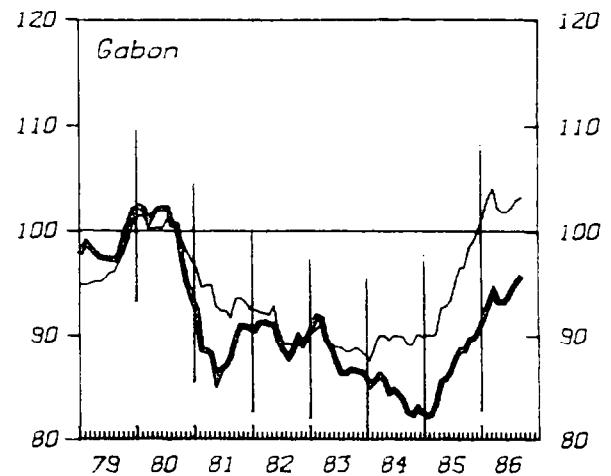
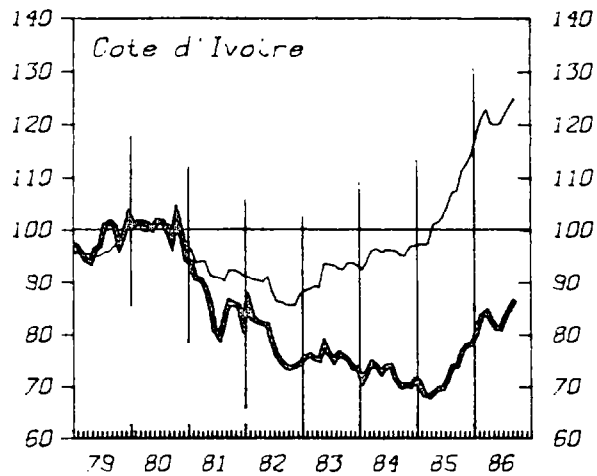




DEVELOPING COUNTRIES - AFRICA
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES,
1979 - SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
consumer price indices

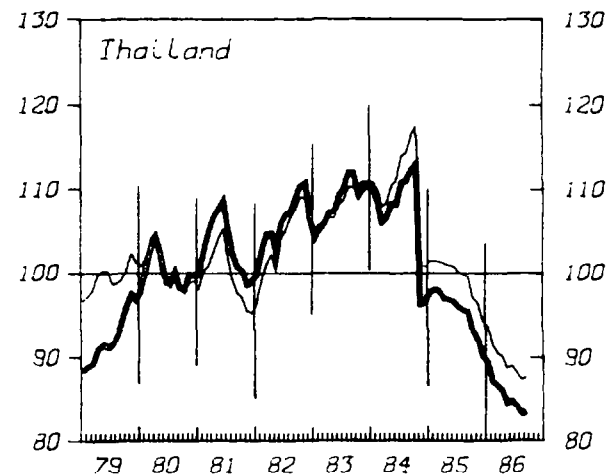
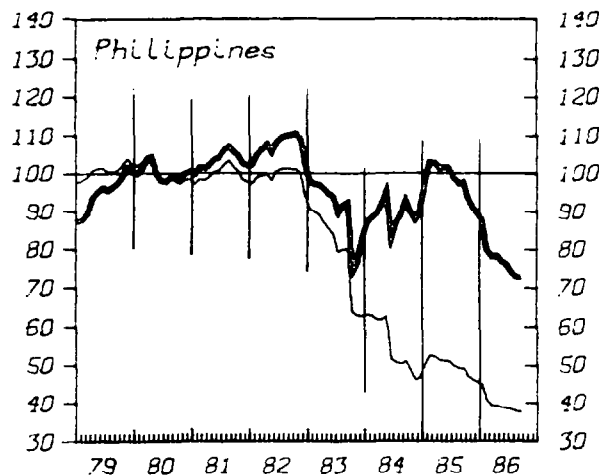
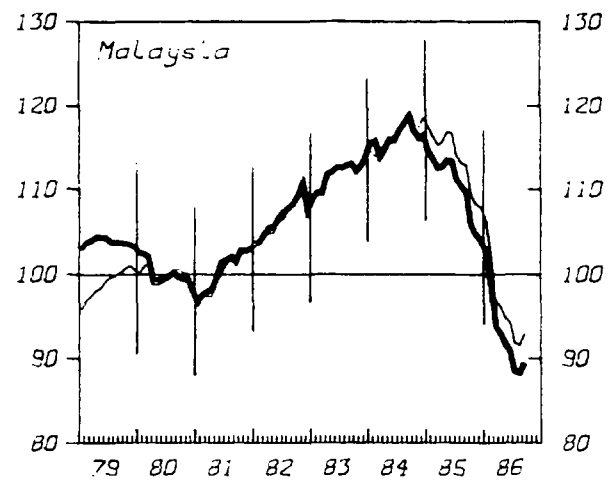
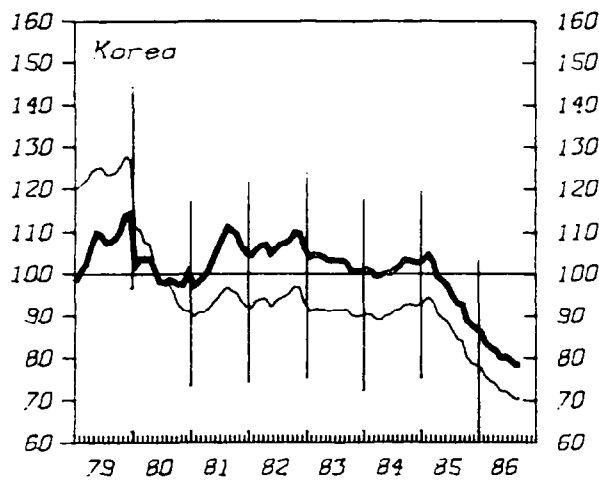
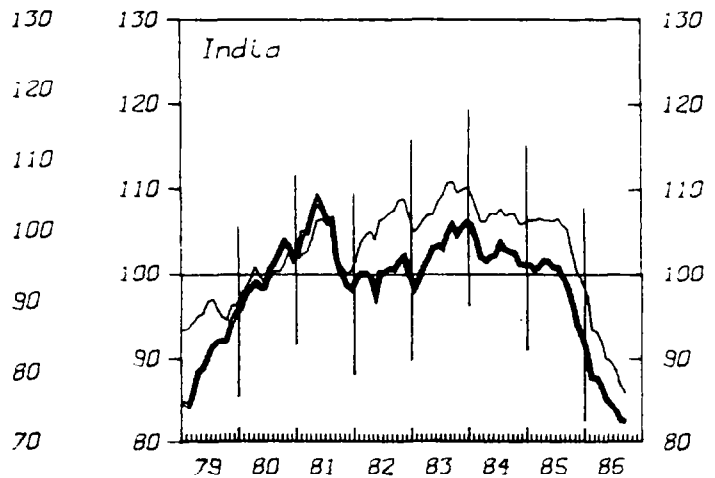
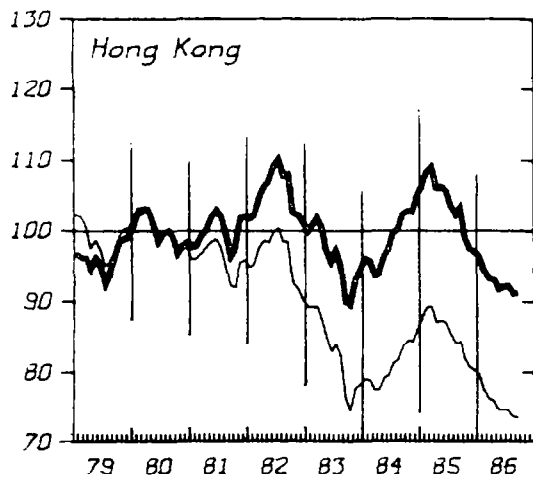




DEVELOPING COUNTRIES — ASIA
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES,
1979 — SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on
consumer price indices

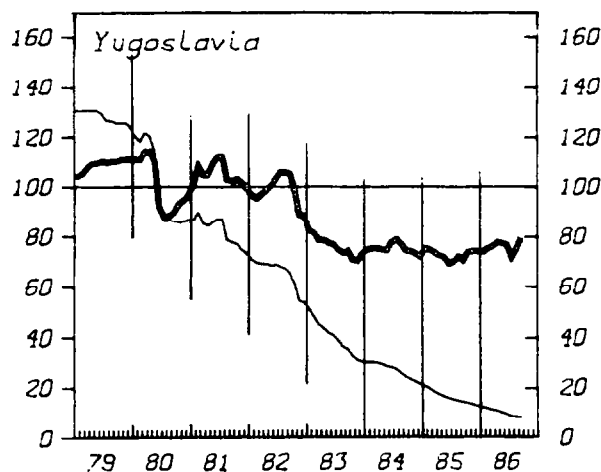
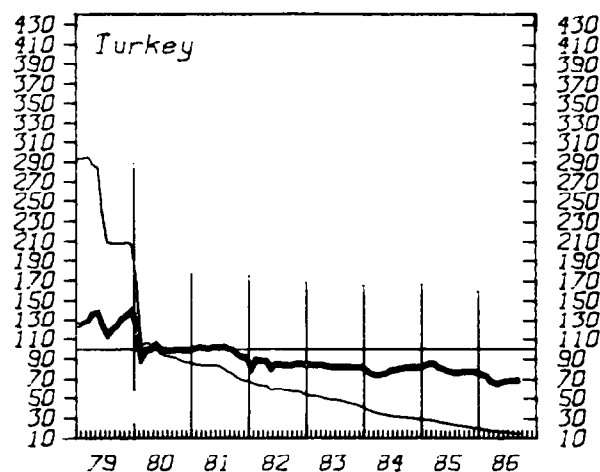
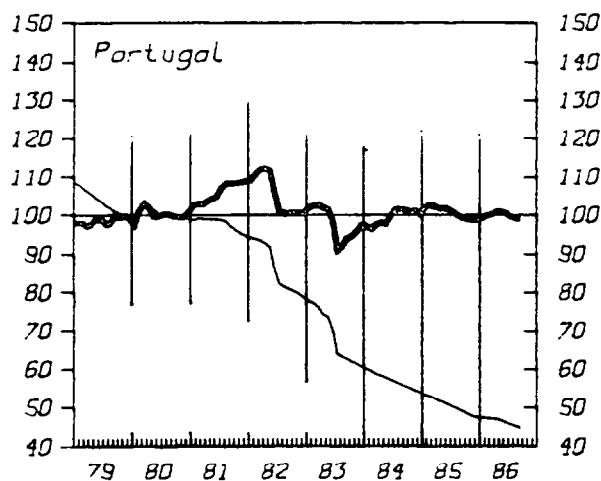
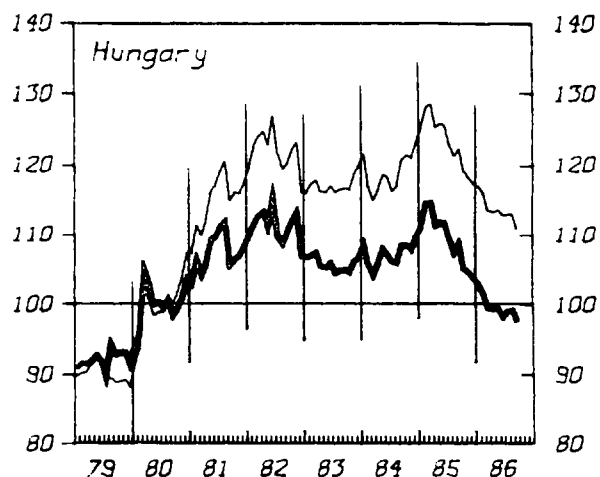
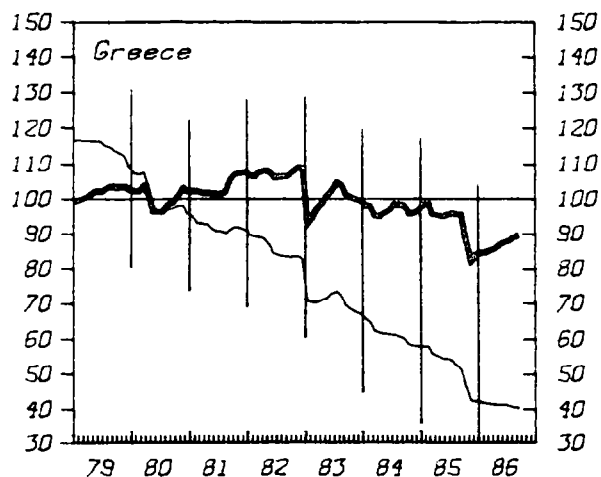




DEVELOPING COUNTRIES — EUROPE
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES
1979 — SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on consumer price indices

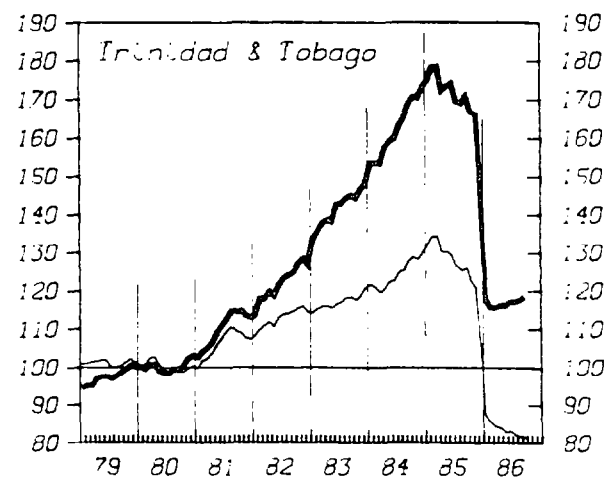
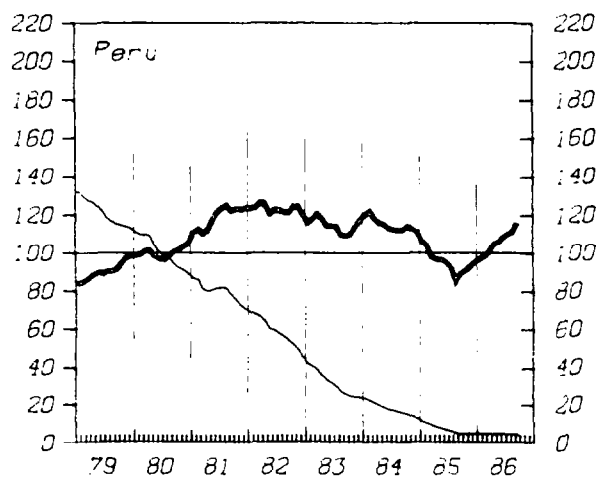
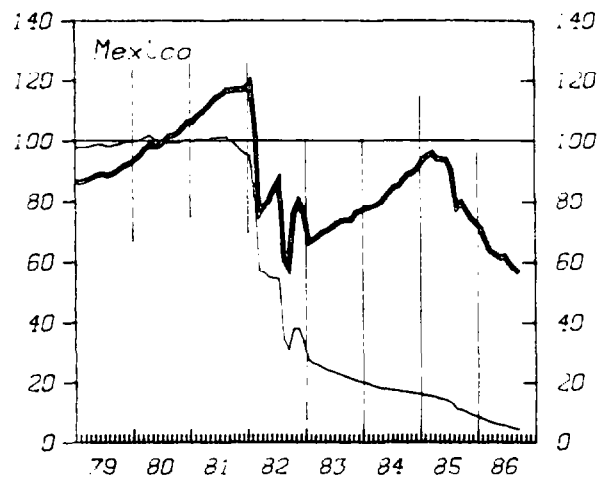
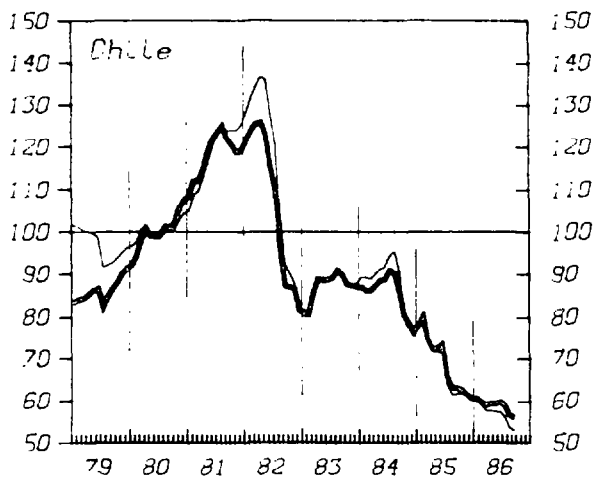
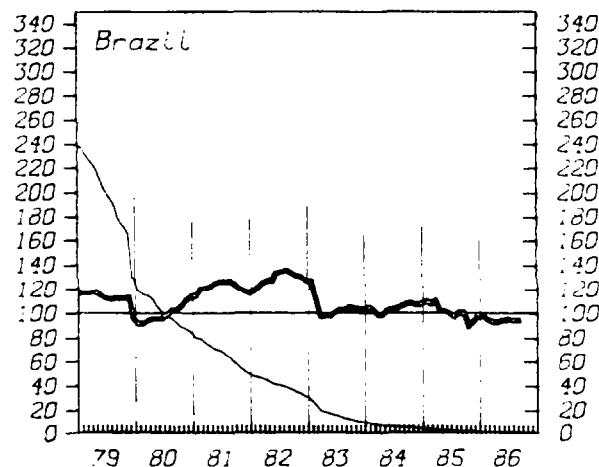
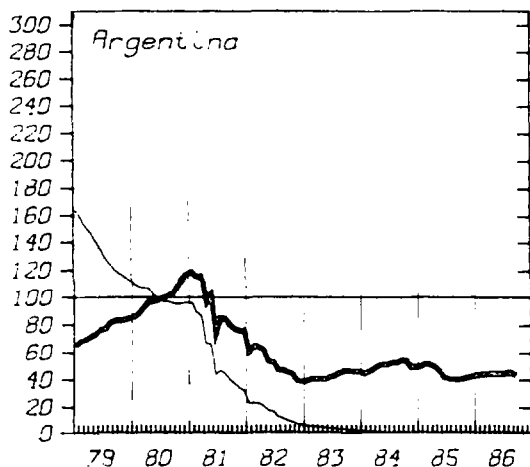




DEVELOPING COUNTRIES — WESTERN HEMISPHERE NOMINAL AND REAL EFFECTIVE EXCHANGE RATES, 1979 - SEPT. 1986 (Index 1980 = 100)

— Nominal effective exchange rate

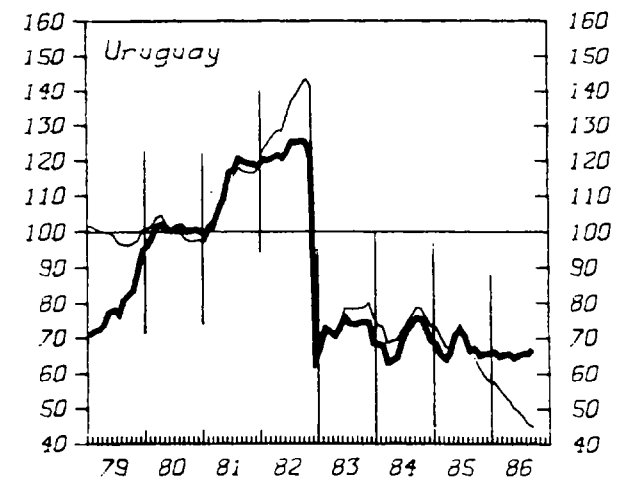
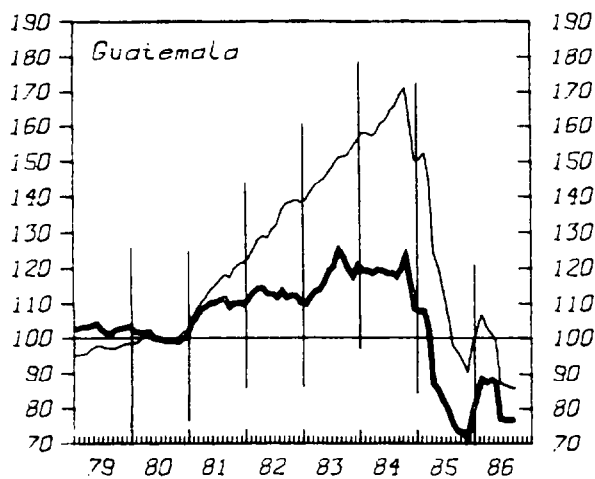
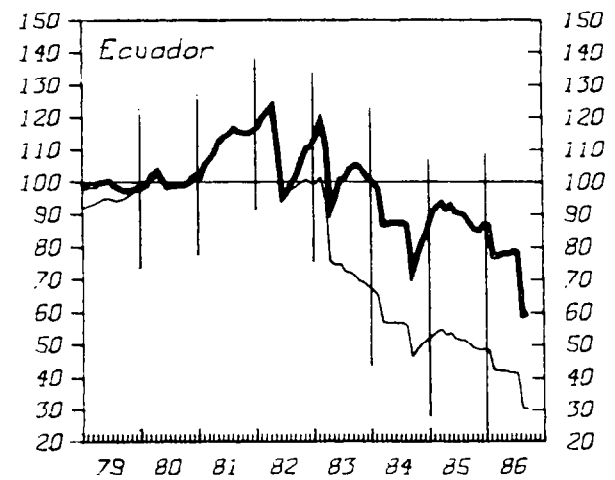
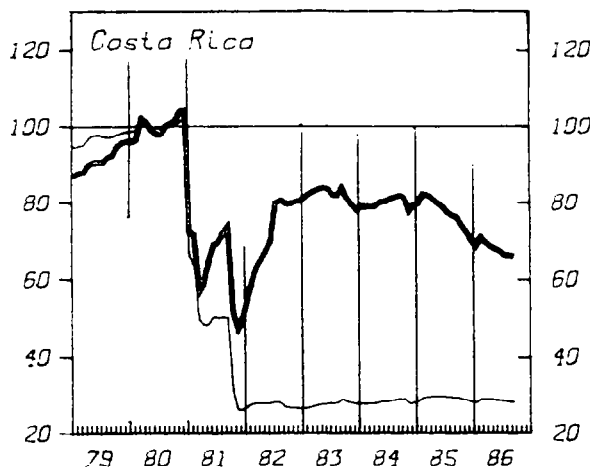
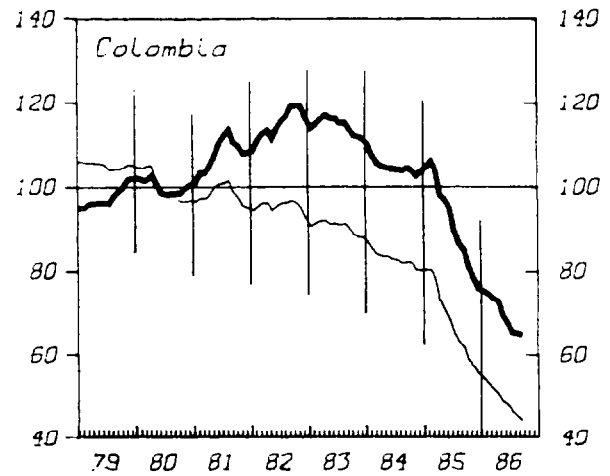
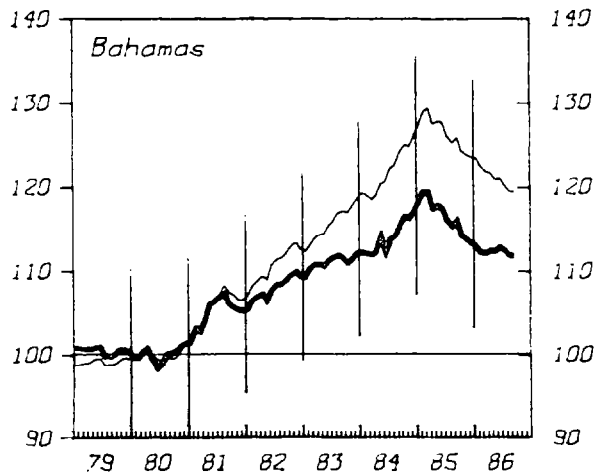
— Real effective exchange rate based on consumer price indices



DEVELOPING COUNTRIES — WESTERN HEMISPHERE
NOMINAL AND REAL EFFECTIVE EXCHANGE RATES
1979 — SEPT. 1986
(Index 1980 = 100)

— Nominal effective exchange rate

— Real effective exchange rate based on consumer price indices





Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

African Department

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Algeria	II.N	98.8	119.6	130.6	143.6	152.2	133.6	127.4
Benin	II.N	100.8	88.3	82.6	80.4	81.0	80.2	79.9
Botswana	II.R*	103.4	99.7	96.4	99.9	89.4	87.8	84.3
	II.N*	102.0	99.7	96.5	101.6	95.7	98.7	96.7
Burkina Faso (b)	II.R*	93.4	88.7	85.7	82.0	83.7	83.6	82.9
	II.N*	98.5	89.8	85.7	83.0	83.1	85.4	85.5
Burundi	II.R	83.0	130.4	142.4	131.8	134.7	119.0	112.6
	II.N	97.9	142.1	160.1	146.0	161.8	152.0	136.9
Cameroon (b)	II.R	102.7	89.8	93.2	94.6	98.9	109.4	113.1
	II.N	95.5	89.7	87.2	86.6	90.1	96.7	97.5
Cape Verde (b)	II.N	111.0	99.2	97.7	98.2	98.9	94.3	94.6
Central African Rep. (b)	II.R	90.6	95.8	93.4	90.9	93.1	98.8	100.4
	II.N	93.2	93.6	93.2	96.1	103.4	111.4	113.0
Chad	II.N*	95.4	92.4	92.4	92.5	95.1	96.4	96.7
Comoros	II.N	98.3	87.3	84.3	82.7	84.1	93.1	96.6

1/ All data refer to period averages. Countries with changes in real effective exchange rates that exceed 20 percent between the average level for 1980 and that for September 1986 are flagged by one check mark. Countries with changes that exceed 30 percent are flagged by two check marks.

Letters in parentheses next to country names refer to qualifications of the data used, as follows: (a) price index significantly affected by price controls; (b) price index has limited coverage in terms of commodities or geographical area; (c) price index based on out-of-date consumer basket; and (d) price index believed to under-estimate the actual rate of inflation.

2/ N refers to the nominal effective exchange rate and R to the real effective exchange rate. The notations I and II indicate whether the first or second index, as defined in the Appendix, is used. The asterisk (*) indicates a country for which the old "Type III" index used in past issues of this report has been retained. For details, see "Indicators of Real Effective Exchange Rates," September 5, 1986 (EBS/86/208).

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

African Department (continued)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr. '86- Sept. '86	Sept. 1986
Congo (a,b)	II.R	105.2	99.5	96.0	99.2	100.2	103.3	104.2
	II.N	99.1	92.9	89.6	87.6	87.6	88.4	88.6
Côte d'Ivoire (b,c)	II.R	89.1	78.2	75.2	72.0	72.3	83.3	86.7
	II.N	90.8	88.1	91.8	95.6	104.6	121.8	125.0
Djibouti	II.N	101.1	132.8	143.2	155.5	162.0	130.0	125.6
Equatorial Guinea	II.N	127.3	63.2	61.0	63.5	12.4	13.5	13.6
Ethiopia (a,b,c,d)	II.R	103.5	118.8	121.1	136.4	162.6	119.6	113.9
	II.N	96.4	137.5	157.7	184.4	208.2	185.6	181.2
Gabon (b)	II.R	97.3	89.8	88.1	84.2	86.8	94.2	95.8
	II.N	93.0	90.5	89.2	89.4	94.6	102.4	103.3
✓✓ Gambia, The <u>3/</u>	II.R	97.7	96.2	96.7	89.9	98.2	67.7	66.9
	II.N	85.1	103.4	103.7	88.7	91.5	42.9	41.6
✓✓ Ghana (a)	II.R	96.7	278.3	187.0	72.2	52.5	31.6	30.8
	II.N	183.5	131.5	54.8	13.5	9.9	5.2	4.7
Guinea	II.N	95.0	114.9	129.1	147.2	163.3	10.2	9.4
Guinea-Bissau	II.N	93.1	114.9	129.0	60.8	44.3	31.4	29.4
Kenya (b)	II.R	104.2	100.6	95.4	102.2	101.0	86.6	85.2
	II.N	99.4	93.0	85.5	90.6	86.6	76.4	75.5
Lesotho	II.R*	94.8	95.6	99.6	99.1	97.1	98.2	97.4
	II.N*	99.8	99.7	100.0	99.2	97.5	96.3	96.2
Liberia	II.R	93.8	114.8	120.2	124.1	123.6	104.4	102.5
	II.N	94.7	128.0	144.1	164.0	183.0	164.8	162.1

3/ Since January 1986, exchange rate data correspond to end of period.

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

African Department (continued)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr. '86- Sept. '86	Sept. 1986
Madagascar (a,b)	II.R	88.5	111.8	112.7	96.6	91.8	88.3	80.1
	II.N	92.5	84.2	79.1	69.1	66.0	59.7	52.1
Malawi <u>4/</u>	II.R	93.7	96.0	97.7	96.7	97.0	87.6	81.0
	II.N	97.9	100.7	100.3	97.8	94.5	80.8	74.5
Mali (b)	II.R*	103.7	89.4	89.3	91.5	94.6	100.0	99.0
	II.N*	100.4	93.4	91.0	89.8	90.2	91.4	91.3
Mauritania (b)	II.R	102.8	125.9	124.2	117.2	109.6	102.6	103.3
	II.N	95.0	123.1	135.8	136.2	126.6	116.2	115.2
Mauritius	II.R	103.2	98.9	99.4	96.1	93.2	90.9	90.0
	II.N	133.7	95.0	96.8	93.0	89.9	89.1	88.4
✓ Morocco	II.R	103.0	90.3	84.3	79.5	74.2	71.3	70.2
	II.N	96.2	92.5	89.6	82.8	78.4	72.6	72.1
Mozambique	II.N*	103.2	115.0	118.7	132.6	152.5	146.2	143.4
Niger	II.R*	102.5	103.2	89.9	88.9	84.0	80.5	83.0
	II.N*	97.7	93.0	90.0	87.8	88.3	88.4	87.6
✓ Nigeria <u>5/</u>	II.R	90.8	113.9	134.5	185.3	166.1	98.1	78.0
	II.N	88.3	108.2	112.3	120.4	110.4	69.0	54.9
✓ Rwanda	II.R	98.6	130.9	141.5	145.3	146.1	130.6	126.8
	II.N	98.3	137.6	153.7	165.7	180.5	177.6	176.8
São Tomé & Príncipe	II.N	93.4	120.4	151.2	179.2	199.0	206.3	208.4
Senegal	II.R*	104.9	91.8	92.3	94.4	103.1	112.1	108.2
	II.N*	97.5	94.1	93.6	94.1	99.0	105.1	106.4

4/ Price index is composite of various local price indices for differing income classes and geographical areas.

5/ Price index is a composite of consumer prices.

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

African Department (concluded)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
✓ Seychelles (a)	II.R	97.2	116.4	122.1	128.4	129.4	123.9	123.7
	II.N	99.2	128.8	135.8	145.5	153.9	151.6	152.3
✓✓ Sierra Leone	II.R	98.2	147.5	180.6	224.0	186.1	154.4	60.8
	II.N	105.3	111.1	90.1	68.6	36.0	19.3	5.7
✓✓ Somalia (b,c)	II.R	64.4	95.4	105.3	168.0	92.6	60.4	57.9
	II.N	96.4	67.8	60.4	55.5	24.0	12.0	10.7
Swaziland <u>6/</u>	II.R*	...	100.4	103.0	99.5	93.2	87.4	85.3
	II.N*	98.1	94.6	95.8	89.2	77.9	72.2	72.5
✓ Tanzania (a,b,d)	II.R	94.5	153.7	171.7	177.6	196.2	113.4	76.8
	II.N	107.5	119.5	115.0	97.9	92.3	47.0	31.6
Togo (b,c)	II.R	100.0	94.9	94.5	84.4	80.7	84.9	84.7
	II.N	95.1	89.7	89.5	90.7	95.6	103.6	104.8
✓ Tunisia	II.R	106.8	98.7	97.6	97.5	96.9	82.9	72.5
	II.N	101.4	99.8	98.9	98.7	97.6	83.2	72.7
✓✓ Uganda (b)	II.R	31.9	19.7	15.4	9.8	10.5	9.6	12.2
	II.N	91.6	10.7	7.9	4.6	2.9	1.3	1.3
✓✓ Zaire (b)	II.R	141.7	97.7	114.7	45.6	41.2	42.9	42.1
	II.N	328.6	66.5	55.1	14.5	12.0	9.0	8.0
✓✓ Zambia	II.R	104.4	114.0	105.7	90.9	84.0	45.3	48.8
	II.N	95.3	116.2	102.8	83.5	66.8	24.8	25.0
Zimbabwe	II.R	100.5	116.3	103.4	103.5	92.0	84.6	86.1
	II.N	97.3	111.6	90.5	85.1	76.5	66.0	65.5

6/ Real exchange rate data differ from the previous report because of revisions of price data.

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Asian Department

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Bangladesh	II.R	97.7	95.1	94.2	104.5	107.0	93.1	94.4
	II.N	103.1	87.6	84.6	90.8	89.9	73.2	72.6
Bhutan	II.N*	99.5	100.5	100.6	100.5	100.6	98.9	98.5
Burma (a,b)	II.R	107.8	91.8	94.3	96.3	102.8	100.7	101.9
	II.N	95.8	101.6	103.3	105.5	110.4	106.4	106.8
✓✓ China, People's Rep. (a)	II.R	97.5	85.2	83.7	74.4	63.1	45.1	40.7
	II.N	85.2	100.4	105.4	100.2	85.8	62.0	55.9
Fiji	II.R	96.5	103.1	102.5	103.7	105.2	94.0	93.1
	II.N	95.0	106.5	106.8	109.5	115.1	107.7	106.0
India	II.R	90.1	100.1	102.9	102.4	98.8	84.0	82.3
	II.N	97.0	105.8	108.3	106.8	104.6	88.7	85.7
✓✓ Indonesia	II.R	119.4	117.5	95.3	92.4	89.8	72.1	59.0
	II.N	144.5	109.3	82.2	74.4	71.1	55.4	43.9
✓ Japan	I.R	129.6	96.1	99.5	100.4	97.1	118.3	120.9
	I.N	113.3	108.7	120.2	128.2	131.0	167.7	172.7
✓✓ Kiribati	II.R	...	104.9	101.1	106.0	89.9	72.9	67.7
	II.N	102.3	109.8	106.1	111.5	95.7	76.7	71.1
✓ Korea	II.R	97.6	106.9	102.7	101.2	95.5	79.5	78.4
	II.N	123.9	94.1	90.9	91.0	86.4	71.4	70.5
Lao P.D. Rep. <u>7/</u>	II.N	258.2	32.6	34.0	35.9	32.5	12.2	12.0
Malaysia	II.R	101.4	106.8	111.8	116.2	110.4	90.1	89.4
	II.N	92.6	106.4	111.8	116.3	113.5	93.4	92.8

7/ The value of the nominal effective exchange rate for 1978 is that for May, rather than the annual average.

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Asian Department (concluded)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Maldives	II.N	86.7	118.4	124.0	129.4	132.7	118.8	116.9
Nepal	II.R*	106.0	115.9	117.9	109.1	107.9	96.3	96.4
	II.N*	99.8	108.1	103.4	98.7	94.8	72.6	71.3
Papua New Guinea	II.R	95.1	100.7	97.4	98.2	94.1	89.5	88.7
	II.N	91.1	106.6	102.9	104.8	104.6	99.8	98.9
✓ Philippines	II.R	87.7	107.1	90.1	89.3	97.7	74.9	72.7
	II.N	101.1	99.3	79.3	54.5	49.3	38.2	37.4
Singapore	II.R	99.7	110.8	112.1	113.9	111.1	93.0	92.3
	II.N	93.3	113.8	118.1	121.5	121.6	105.2	104.8
Solomon Islands	II.R	94.4	109.9	99.6	100.5	96.7	83.3	81.4
	II.N	95.3	98.2	87.5	83.6	76.6	58.8	55.7
Sri Lanka	II.R	80.6	112.9	112.3	124.9	116.8	103.2	102.5
	II.N	107.7	95.9	89.9	89.6	88.2	75.0	73.5
Thailand	II.R	91.2	105.9	108.7	107.3	95.4	84.3	83.5
	II.N	100.1	103.7	107.7	110.2	99.4	88.4	87.6
✓✓ Tonga	II.R	98.0	115.4	114.6	118.0	114.2	128.9	130.4
	II.N	101.9	110.1	106.5	114.6	100.8	85.9	82.3
Vanuatu	II.R	101.1	99.4	100.3	108.6	103.0	94.4	97.4
	II.N	95.2	88.1	92.9	101.4	100.7	89.5	91.0
Viet Nam	II.N	105.4	28.6	29.3	31.7	25.2	2.0	2.0
✓ Western Samoa	II.R	105.1	105.9	97.2	93.0	84.6	80.6	78.8
	II.N	125.8	89.4	74.3	66.8	59.4	54.9	54.1

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

European Department

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr. '86- Sept. '86	Sept. 1986
✓ Australia	II.R	102.7	108.8	106.5	109.6	92.3	79.3	73.3
	II.N	99.4	107.7	101.7	107.2	90.2	74.4	68.1
Austria (a)	I.R	105.8	97.2	97.4	94.8	93.8	101.0	102.3
	I.N	95.4	101.6	103.8	103.3	103.7	108.1	109.4
✓ Belgium	I.R	105.4	80.1	76.7	74.2	72.2	73.7	74.4
	I.N	99.7	86.3	83.8	82.2	82.7	86.5	87.5
Cyprus	II.R	98.9	94.1	92.0	90.9	91.1	88.3	86.5
	II.N	95.3	100.7	102.2	104.7	109.1	110.0	106.9
Denmark	I.R	111.8	88.4	88.4	84.8	85.4	89.8	90.9
	I.N	110.1	90.1	90.3	87.6	88.6	92.5	93.5
Finland	I.R	99.4	105.0	100.4	103.4	103.1	99.3	98.9
	I.N	97.1	104.0	99.2	101.1	101.4	99.5	99.1
France	I.R	95.6	95.6	92.8	91.3	91.9	92.8	92.9
	I.N	99.5	85.5	79.5	76.2	77.0	78.2	78.3
Germany	I.R	102.3	90.9	92.1	89.0	87.4	94.8	96.9
	I.N	95.3	100.3	104.1	103.0	103.0	111.5	114.3
Greece (a)	II.R	98.1	107.2	99.6	96.7	93.1	87.8	89.6
	II.N	120.8	85.3	70.1	60.7	51.7	40.6	39.9
Hong Kong	II.R	101.7	105.1	96.1	98.8	103.6	91.8	91.2
	II.N	108.2	96.2	82.9	81.1	85.2	74.3	73.3

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

European Department (continued)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Hungary (a)	II.R	90.4	111.1	105.7	107.0	109.4	98.7	97.3
	II.N	88.7	121.8	116.9	118.7	123.1	112.6	110.6
Iceland	II.R	98.3	96.9	90.5	96.3	95.6	94.7	95.3
	II.N	183.5	50.7	27.0	22.7	17.9	14.9	14.7
Ireland	I.R	95.7	95.5	88.8	84.7	82.2	83.8	81.0
	I.N	103.2	90.0	86.8	83.6	84.2	89.1	86.9
Israel (a)	II.R	90.6	106.4	115.8	108.8	105.3	103.0	101.6
	II.N	295.7	26.3	12.8	3.1	0.7	0.4	0.4
Italy	I.R	94.7	103.5	108.8	107.7	106.0	108.2	110.2
	I.N	108.3	84.0	81.1	77.3	73.0	73.8	74.9
Luxembourg	II.R*	104.0	91.6	91.7	91.5	91.9	92.7	92.3
	II.N*	100.4	90.9	88.8	88.0	88.4	90.0	90.2
Malta	II.R	95.5	112.1	109.2	107.7	104.5	98.5	97.6
	II.N	96.5	114.2	119.5	124.9	127.4	120.9	120.2
Netherlands	I.R	109.9	91.4	89.6	85.0	82.5	84.3	85.5
	I.N	98.7	100.3	102.0	100.4	100.2	107.2	109.3
Netherlands Antilles	II.R*	99.3	107.7	111.1	115.2	113.9	106.4	104.9
	II.N*	101.5	107.0	111.3	118.9	122.4	116.4	115.3
New Zealand	II.R	99.6	104.5	100.8	93.7	95.3	95.5	87.7
	II.N	109.4	92.0	87.0	79.5	73.2	67.9	61.2

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

European Department (concluded)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr. '86- Sept. '86	Sept. 1986
Norway	I.R	104.7	108.9	111.7	114.0	114.8	112.1	110.4
	I.N	100.6	102.2	99.4	97.4	95.2	88.5	86.4
Poland	II.R	...	137.6	166.8	162.7	143.8	113.0	95.0
	II.N	...	71.2	74.8	69.6	59.2	43.6	36.0
Portugal	II.R	102.5	105.2	97.7	99.2	100.4	99.6	98.5
	II.N	122.1	85.9	68.1	56.5	50.1	45.5	44.4
✓✓ Romania (a)	II.R	118.6	156.5	148.0	126.7	155.4	127.6	131.6
	II.N	97.8	163.0	159.9	148.9	199.7	175.8	183.2
✓✓ South Africa	II.R	88.1	99.8	109.8	97.0	73.6	64.8	66.5
	II.N	94.0	88.4	90.5	74.9	51.0	38.4	38.0
Spain	I.R	84.3	97.7	85.8	86.4	89.4	91.5	92.2
	I.N	98.8	87.5	72.7	71.4	69.6	67.5	67.5
Sweden	I.R	101.6	88.1	79.5	85.7	88.2	85.0	84.3
	I.N	99.9	88.5	77.9	79.4	78.7	76.2	75.6
Switzerland	I.R	112.5	101.4	104.5	101.2	98.3	107.7	111.5
	I.N	101.0	109.9	114.9	113.4	112.2	122.6	126.9
✓✓ Turkey (a)	II.R	118.1	84.2	82.1	77.9	78.4	66.9	68.1
	II.N	322.9	58.7	46.3	31.5	23.0	14.4	13.7
United Kingdom	I.R	72.0	102.0	97.1	97.2	102.7	101.6	97.2
	I.N	85.9	96.6	89.5	85.4	85.0	79.2	74.9
✓ Yugoslavia (a)	II.R	104.0	98.3	75.5	74.8	72.4	75.9	79.3
	II.N	137.1	65.0	39.0	26.2	15.4	8.7	8.1

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Middle Eastern Department

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Afghanistan	II.N	94.9	109.9	117.3	128.1	135.7	113.6	110.8
Bahrain	II.R	115.8	124.0	128.5	131.5	128.0	102.7	100.0
	II.N	100.9	119.5	125.4	132.9	137.3	115.5	113.5
✓✓ Egypt (a,b,c,d)	II.R	114.1	118.5	133.9	156.3	164.2	153.0	154.9
	II.N	121.4	116.7	123.5	133.7	134.6	110.5	107.9
✓✓ Iran, I.R. of (c)	II.R	93.9	139.7	166.1	187.3	191.9	183.1	182.6
	II.N	100.7	113.5	120.5	129.2	135.2	125.4	124.2
Iraq	II.N	100.1	133.2	140.0	156.5	166.3	132.2	127.5
Jordan (b)	II.R	97.3	106.9	108.0	110.0	109.4	100.0	98.2
	II.N	100.3	108.3	114.3	119.4	122.1	116.7	115.1
Kuwait (a)	II.R	105.1	112.7	115.9	117.5	116.3	95.4	92.0
	II.N	99.1	113.7	116.5	121.3	122.4	101.3	97.7
Lebanon	II.N	121.1	96.7	109.6	84.4	35.2	12.9	10.0
Libya	II.N	98.0	143.5	161.5	185.6	200.9	153.6	149.9
Oman	II.N	104.0	121.4	127.3	136.0	139.9	101.5	99.1
✓ Pakistan (a)	II.R	102.3	103.5	99.4	101.7	95.2	77.3	74.3
	II.N	100.4	104.6	101.0	103.5	97.4	79.5	76.5
Qatar	II.N	98.5	124.1	130.8	140.9	144.7	116.7	113.8
✓✓ Saudi Arabia	II.R	115.0	103.6	103.2	101.6	94.5	71.4	67.9
	II.N	99.0	117.1	120.9	125.6	125.2	99.6	95.7
Sudan (a,b,c)	II.R	113.3	86.6	84.5	106.7	99.0	93.4	93.9
	II.N	150.4	67.4	53.7	54.5	37.5	29.1	28.7

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Middle Eastern Department (concluded)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
<hr/>								
Syrian Arab Rep.	II.N	102.4	133.1	145.3	160.9	168.1	136.2	131.4
United Arab Emirates	II.N	98.7	123.9	129.8	138.8	142.9	115.9	112.9
Yemen Arab Rep.	II.N	100.1	124.3	131.6	123.2	109.0	82.8	81.0
Yemen, P.D. Rep.	II.N	100.6	127.5	137.7	151.5	160.6	132.9	129.6

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Western Hemisphere Department

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
Antigua & Barbuda	II.R*	94.2	106.1	107.0	110.8	112.2	107.9	107.2
	II.N*	102.9	108.6	112.0	117.5	120.0	114.0	113.7
✓✓ Argentina <u>8/</u>	II.R	54.5	50.7	42.7	49.8	44.0	43.9	42.2
	II.N	220.2	14.2	3.2	0.7	0.1	0	0
Bahamas	II.R	102.4	107.9	111.0	113.9	116.4	112.2	111.7
	II.N	99.5	110.6	115.5	121.8	126.3	120.3	119.2
✓ Barbados	II.R	101.0	117.9	123.7	130.5	133.2	124.0	123.6
	II.N	102.4	113.5	120.0	129.0	134.5	128.2	127.8
Belize	II.N	101.8	116.1	124.1	133.4	145.8	139.0	138.7
Bolivia <u>8/</u>	II.R	87.3	137.6	125.7	187.6	268.0	83.1	85.1
	II.N	93.0	90.1	29.2	7.8	0.3	0	0
Brazil	II.R	122.8	128.5	104.2	104.2	100.4	93.8	94.7
	II.N	286.9	39.5	15.4	5.3	1.8	0.7	0.7
Canada	I.R	102.3	111.8	118.5	118.4	112.6	104.2	103.1
	I.N	103.9	101.7	103.6	100.9	96.3	88.3	87.3
✓✓ Chile	II.R	85.2	106.7	86.9	85.3	68.8	58.2	55.7
	II.N	110.4	114.1	87.0	88.1	67.9	55.6	52.6
✓✓ Colombia	II.R	95.0	114.8	114.3	104.6	91.4	66.9	64.2
	II.N	113.4	95.2	90.3	82.6	67.3	46.8	44.0
✓✓ Costa Rica	II.R	87.0	71.8	81.9	79.8	77.2	66.9	65.6
	II.N	95.6	27.3	27.6	28.2	29.0	28.3	27.9

8/ Nominal effective exchange rates for Argentina and Bolivia equal 0.034 and 0.009 in September 1986, respectively.

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Western Hemisphere Department (continued)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr.'86- Sept.'86	Sept. 1986
✓ Dominica	II.R*	88.2	111.8	118.7	128.5	130.0	120.3	122.7
	II.N*	103.9	113.4	122.6	140.0	148.8	139.0	139.3
✓ Dominican Republic	II.R	99.7	102.8	97.3	71.0	76.8	72.6	71.3
	II.N	96.1	113.8	113.8	74.8	65.9	62.0	59.3
✓✓ Ecuador	II.R	99.4	109.5	104.2	86.0	89.3	71.8	59.7
	II.N	93.0	106.4	78.2	55.3	51.3	37.5	29.8
✓ El Salvador	II.R	93.9	120.9	128.5	138.6	146.3	116.4	120.9
	II.N	94.5	130.7	140.2	154.2	157.6	114.7	115.3
✓ Grenada	II.R*	91.4	122.7	129.1	137.7	137.9	127.7	123.7
	II.N*	105.9	115.0	121.3	130.1	133.7	127.0	126.3
✓ Guatemala	II.R	103.7	112.3	117.4	117.8	85.0	80.3	77.0
	II.N	96.3	132.1	147.8	161.2	115.3	90.6	85.7
✓✓ Guyana (a,d)	II.R	97.0	122.6	143.7	146.7	151.5	144.4	147.4
	II.N	98.6	104.6	116.8	106.1	105.7	98.9	97.9
✓✓ Haiti (d)	II.R	93.5	112.8	124.4	131.9	143.8	135.7	135.5
	II.N	96.1	119.3	130.3	143.1	154.6	149.5	148.1
✓ Honduras	II.R	95.3	115.7	124.2	130.4	135.2	125.8	124.4
	II.N	96.6	130.2	145.2	163.3	186.4	189.1	189.2
✓✓ Jamaica (a)	II.R	96.0	110.5	104.3	72.9	63.7	67.8	67.6
	II.N	126.1	113.7	104.0	61.5	45.5	44.1	43.8
✓✓ Mexico	II.R	84.0	81.6	71.8	83.9	86.3	59.6	56.0
	II.N	98.7	51.9	23.0	17.4	12.4	4.9	3.9

Nominal and Real Effective Exchange Rates 1/

(Index 1980 = 100)

Western Hemisphere Department (concluded)

Countries	Type of Index <u>2/</u>	1978	1982	1983	1984	1985	Apr. '86- Sept. '86	Sept. 1986
✓✓ Nicaragua (a)	II.R	91.3	136.9	170.6	209.2	347.9	830.0	1108.3
	II.N	136.9	129.1	142.5	146.4	92.9	32.8	32.9
Panama	II.R	101.0	105.4	106.3	106.9	107.7	98.3	96.7
	II.N	94.2	122.3	131.0	140.4	151.5	147.8	146.9
Paraguay	II.R	79.4	107.6	123.3	99.3	74.3	77.3	83.0
	II.N	61.4	198.3	341.4	439.6	535.2	655.7	720.9
Peru (a,b)	II.R	87.8	122.8	114.5	114.5	94.7	109.4	116.2
	II.N	173.4	57.9	30.7	17.2	6.7	4.6	4.6
St. Christopher & Nevis <u>9/</u>	II.R*	102.3	106.1	107.1	109.1	108.8	104.5	104.1
	II.N*	104.8	109.1	113.9	119.9	122.4	121.4	121.9
St. Lucia (b)	II.R*	102.7	112.6	114.3	117.8	117.0	109.5	109.1
	II.N*	104.2	111.8	117.8	127.2	131.5	124.1	123.9
St. Vincent	II.R*	100.4	109.5	113.2	115.1	113.9	111.5	110.0
	II.N*	105.1	109.8	114.7	120.7	123.3	123.4	123.7
✓✓ Suriname	II.R	94.6	117.2	123.6	132.0	145.7	137.7	137.6
	II.N	99.3	122.6	133.3	149.4	160.7	141.6	138.6
Trinidad & Tobago	II.R	95.2	122.0	141.4	162.4	169.7	117.1	118.5
	II.N	102.4	112.7	116.9	124.4	126.4	82.6	81.6
United States	I.R	100.2	124.8	127.9	137.1	142.8	112.9	109.2
	I.N	102.9	125.0	131.2	141.7	146.3	115.8	112.1
✓✓ Uruguay	II.R	71.9	117.6	72.3	69.3	66.9	65.3	66.9
	II.N	116.6	128.1	75.4	73.2	66.4	47.8	44.5
✓ Venezuela	II.R	90.8	121.2	110.4	93.7	90.0	78.8	78.1
	II.N	96.5	118.9	110.5	91.7	85.9	72.6	71.2

9/ The value of the real effective exchange rate for 1978 is that for January, rather than the annual average.

Statistical Appendix

I. First Index

Countries for which the index is calculated:

Austria	France	Japan	Sweden
Belgium	Germany, Fed.	Netherlands	Switzerland
Canada	Rep. of	Norway	United Kingdom
Denmark	Ireland	Spain	United States
Finland	Italy		

This index of the real effective exchange rate for the above countries is based on one of the indicators of competitiveness in manufacturing already published in International Financial Statistics (IFS). Out of the five indicators in IFS, that for relative normalized unit labor costs adjusted for exchange rate changes was selected as the most reliable one for the purpose at hand. This indicator is subject to errors in the estimation of the cyclically-adjusted rate of growth of output per manhour, but as long as the period considered is confined to a few years the size of possible errors remains moderate. Its weighting scheme has the advantage of being built up from disaggregated trade data for manufactures, with the weights reflecting both the relative importance of a country's trading partners in its direct bilateral trade relations and that resulting from competition in third markets. Since data on unit labor costs generally become available only after a considerable lag, estimates of the indicators of real effective exchange rates for recent periods must generally be obtained by using staff estimates of changes in unit labor costs for the most recent months, combined with actual data on exchange rates.

The use of normalized unit labor costs in manufacturing is intended to abstract from cyclical swings in conventionally-measured productivity, which often distort the actual unit labor cost series (mainly because cyclical changes in reported employment do not correspond closely to those in effective inputs of labor). The normalized series are calculated by dividing an index of actual hourly compensation per worker by an index of output per manhour adjusted so as to eliminate the estimated effects of cyclical swings. Quarterly data on hourly compensation per worker and on output per manhour are obtained from national sources. However, these data are often available with a considerable lag, and this obliges the staff to update the series on the basis of its own estimates. The monthly series for these variables are obtained by simple interpolation of the quarterly series. All the data are seasonally adjusted. Finally, the adjustment for cyclical swings is estimated by the staff.

The index of the real effective exchange rate for each of the 17 industrial countries represents the ratio of the country's index of normalized unit labor costs to a weighted geometric average of corresponding indices for the other 16 countries, after expression of all of the national indices of normalized unit labor costs in terms of a common currency. In mathematical terms, the formula is

$$R_i = C_i \cdot E_i / \prod_{j \neq i} (C_j \cdot E_j)^{W_{ij}} \quad (1)$$

where R_i = real effective exchange rate for country i,

C_i = normalized unit labor cost in manufacturing in terms of local currency for country i,

E_i = exchange rate of country i in terms of U.S. cents,

W_{ij} = weight of country j in the real effective exchange rate of country i.

The weights are designed to make the indicators particularly relevant with respect to movements in costs and prices affecting trade in manufactures. They are built up from disaggregated (i.e., four-digit SITC) trade data for manufactures in 1980. At this disaggregated level, they take account of the relative importance of each of the other 16 countries (as measured by market shares) in the home market of the country considered, as well as in all of its foreign markets.

As a by-product of the calculations, a nominal effective exchange rate index is obtained by ignoring the movements in normalized unit labor costs. This nominal effective exchange rate can differ substantially from the normally used MERM-weighted effective exchange rate because both the weights and the number of countries included in the calculations are different.

II. Second Index (Revised)

Whereas previous reports made use of two different effective exchange rate indices for the smaller industrial countries and the developing countries based on data availability, the present report employs a single revised index for nearly all these countries, based on a single conceptual framework.

A convenient starting point for discussion of the revised weighting scheme is the distinction frequently drawn between two broad classes of traded goods. The first, "manufactures", consists of differentiated or manufactured goods; for these goods non-transitory price differentials between different markets and suppliers are often observed in the short to medium term. The second, "primary commodities", includes homogeneous products--such as copper, zinc, palm oil--which are not distinguished on the demand side by country of origin. Thus suppliers cannot for long sustain a price that is different from those of their competitors, and commodity arbitrage is potentially such as to ensure a common or "world" price for the commodity.

Based on this distinction between manufactures and primary products, separate sets of weights have been calculated for each country for manufactured exports, manufactured imports, primary product exports, and primary product imports. The four sets of weights available for each country are aggregated into a single vector based on the associated trade values. In some cases, allowance has been made in the final set of weights for transactions on the services account, notably tourism receipts.

1. Weights for imports and exports of manufactures

Manufactured goods are considered to be distinguished on the demand side by country of origin. That is to say, merchandise of a given kind supplied by producers in one country is assumed to be an imperfect substitute in a particular market for merchandise of the same kind supplied by another country. Price differentials can therefore exist in a market between similar types of manufactures because of differing elasticities of substitution in demand. Exchange rate changes (among other factors) are seen as leading to shifts in demand among similar, but differentiated, manufactured goods produced by various countries, thus affecting export and import trade performance.

On the import side, domestic production is viewed as being in competition with imports in satisfying demand for particular types of manufactured goods. The importance attached by the importing country to a foreign supplier (or competitor) is related in a straightforward manner to the latter's share (in terms of value) in imports of the particular manufactured good. A simple aggregation procedure is used based on how

important each manufactured good is in the country's total imports of manufactures. In effect, the procedure is equivalent to basing the weighting scheme on the shares of foreign suppliers in the country's total imports of manufactures.

An exporter of a particular type of manufactured good is viewed as facing competition in each of its export markets from both domestic output in that market and other exporters. That element of competition provided to an exporter by domestic suppliers in each market is referred to as the bilateral competitive element, while the competition provided by other exporters to that market is referred to as the third-market competitive element. As in the type II index used previously (see EBS/86/208), the two elements are assumed to be of equal importance. The assumption is restrictive, but is occasioned by the fact that data on domestic output by type of manufacture (based on comprehensive input-output tables) are lacking for most countries. In the computation of the export weights for manufactures, trade data disaggregated by type of manufacture and by market are used. Each type of manufactured good is considered separately so that, for example, Japan is considered as a competitor for Korean exports of chemicals, textiles, electrical equipment, etc. To the extent that Korea exports these goods to Japan, Japan is assigned a bilateral competitive weight. Then Korea's other export markets for these goods are examined and a third-market competitive weight assigned to Japan reflecting Japan's share of exports to these markets. Aggregation over the range of goods exported proceeds simply by taking into account the share of each type of manufactured good in Korea's total exports of manufactures. The major difference between the revised scheme and the previously used type II scheme is that competitive relationships are identified on the basis of the direction of trade in types of manufactured goods (two-digit SITC), rather than on the basis of aggregate non-oil trade. The weighting schemes for any country "i" are obtained as follows:

Formulas for trade in manufactures

1. Imports of manufactures

Let: $MM(h,i,j)$ = value of manufactures of type h imported by country i from country j.

$$MM(i,j) = \sum_h MM(h,i,j) \quad (\sum_h \text{ denoting the summation over } h)$$

= total value of manufactures imported by country i from country j.

$$WMM(i,j) = \frac{MM(i,j)}{\sum_j MM(i,j)}$$

= the weight attached by country i to country j.

Manufactured goods are defined as those in Standard International Trade Classification (SITC) groups 5, 6 less 68, 7, and 8, where:

SITC 5 = chemicals;
 SITC 6 = basic manufactures;
 SITC 68 = non-ferrous metals;
 SITC 7 = machines and transport equipment;
 SITC 8 = miscellaneous manufactures.

For any member country i, j ranges over all Fund members, plus certain other currency areas (e.g., Hong Kong).

2. Exports of manufactures

As explained above, there are two elements to the calculation of export competitiveness weights, each of which is assumed to be of equal importance.

WXMB(i,j) = the weight attached to country j by country i due to competition between exporters in country i and domestic suppliers in country j (the bilateral competitive element after aggregation across manufactures).

WXMT(i,j) = the weight attached to country j by country i due to competition from exporters in country j in country i's other export markets (the third-market competitive element after aggregation across manufactures).

The combined weight {WXM(i,j)} is simply:

$$WXM(i,j) = 0.5 \cdot WXMB(i,j) + 0.5 \cdot WXMT(i,j)$$

Let:

XM(h,i,j) = exports of manufactured good h from country i to country j.

The bilateral competitive element, WXMB(i,j), is:

$$WXMB(i,j) = \frac{\sum_h XM(h,i,j)}{\sum_j \sum_h XM(h,i,j)}$$

Country j's bilateral weight is thus the importance of country j as a market for country i's total exports of manufactured goods.

The expression for the third-market element is more complex:

$$WXMT(i,j) = \sum_h \cdot \underbrace{\frac{\sum_k XM(h,i,k)}{\sum_h \sum_k XM(h,i,k)}}_{\langle \text{-----1-----} \rangle} \cdot \sum_k \cdot \underbrace{\frac{XM(h,i,k)}{\sum_k XM(h,i,k)}}_{\langle \text{-----2-----} \rangle} \cdot \underbrace{\frac{XM(h,j,k)}{\sum_{j \neq i} XM(h,j,k)}}_{\langle \text{-----3-----} \rangle}$$

The expression can be divided into three parts, as noted above. Part 3 gives the share (excluding exports of country i) of a competing exporter j in market k for manufacturing good h. Part 2 shows how important market k is to country i when all country i's markets for a particular manufactured good have been considered. Taken jointly, Parts 2 and 3 thus show country j's role as a competitor across all markets to which country i exports good h. The computation is carried out for each type of manufactured good. Part 1 of the expression shows the share of each type of manufactured good in the country i's total exports of manufactures. The summation over h before part 1 thus performs the aggregation over all types of manufactures, yielding country j's share as competitor across all markets to which country i exports all manufactured goods.

In terms of the computation for any country i, the range of j covers all Fund members plus several additional currency areas; k, which refers to markets, ranges over the above entities plus a sub-group of countries belonging to, or affiliated with, the Council for Mutual Economic Assistance (CMEA). The range of h (i.e., types of manufactures) covers 27 SITC two-digit groups within the overall definition of manufactures.

2. Weights for imports and exports of primary products

While manufactured goods are treated as differentiated products, primary products are treated as homogeneous goods (i.e., the output of various suppliers is not distinguished by country of origin). An understanding of how multilateral exchange rate movements influence the common or "world" price for a commodity is a key element in assessing the likely impact on export receipts and import payments in the medium term.

It can be shown, using a simple model of trade in a homogeneous commodity, that the induced change in the world price of the commodity (faced by each exporter or importer) can be expressed as a function of a weighted average of the changes in the exchange rates of exporters' currencies and a weighted average of changes in the exchange rates of importers' currencies. ^{1/} The weight attached to an exporter's exchange rate is related to that country's share in world exports of the commodity, and the weight attached to an importer's exchange rate is related to that country's share in world imports. The relative importance attached to exporters' exchange rates as a group and to importer's exchange rates as a group depends on the size of the world supply and demand elasticities for the commodity. One advantage of basing the weights for exchange rate

^{1/} Ridler, Duncan and Christopher A. Yandle, "A Simplified Method for Analyzing the Effects of Exchange Rate Changes on Exports of a Primary Commodity," Staff Papers, International Monetary Fund (Washington), Vol. 19 (November 1972), pp. 559-78.

indices on this approach, rather than on bilateral trade flow data, is that countries exporting primary products (but not to each other) nevertheless are recognized as competing against each other. It should also be noted that on the demand side it is not the direction of trade which determines an importer's weight but rather the importer's global importance in the demand for primary products.

A disaggregated commodity approach has been taken toward computing the weights. Except in the case of sugar, no attempt has been made to take into account the fact that certain commodities are subject to marketing agreements or, for other reasons, are traded in segmented markets. In the case of sugar, three markets are distinguished---the United States, the EC, and a residual "world" market. The large number of commodities considered also makes it necessary to make further assumptions about the relative importance of the demand and supply sides of the market. It is assumed in the computation of the weights that both are equally important. An exporter of a primary product would assign a weight of 50 percent to importers' currencies as a group, with individual weights within the group being related to shares in world imports of the commodity, and 50 percent to other exporters' currencies with weights dependent on exporters' shares in world exports. Aggregation over commodities then proceeds according to the importance of each commodity in a country's export or import bill for primary products.

3. Formulas for trade in primary products

For country i and for each primary product h, a weight for each country j, $WP(h,i,j)$, is created.

Let:

$XP(h,i)$ = total exports of primary product h by country i.

$MP(h,i)$ = total imports of primary product h by country i.

$$xp(h,i) = \frac{XP(h,i)}{\sum_i XP(h,i)}$$

= share of country i in world exports of primary product h.

$$mp(h,i) = \frac{MP(h,i)}{\sum_i MP(h,i)}$$

= share of country i in world imports of primary product h.

The weight $WP(h,i,j)$ is computed as follows:

$$WP(h,i,j) = 0.5 \cdot \{xp(h,j) / (1 - xp(h,i))\} \\ + 0.5 \cdot \{mp(h,j) / (1 - mp(h,i))\}$$

If country i is an exporter of primary product h (i.e., $XP(h,i) > 0$), then the term $mp(h,i)$ will typically be zero. If country j is also an exporter, its weight will be determined by the first term in brackets on the right hand side of the expression. It will be country j 's share in total exports of primary product h from sources other than country i . If country j is an importer, the weight will typically be country j 's share in total imports of primary product h . Similar considerations apply when country i is an importer of primary product h (i.e., $MP(h,i) > 0$). It should be noted that if country i exports or imports a primary product h but its share of world exports or imports is negligible, the weights that it assigns to other countries collapse to simple world market shares of exports and imports.

Having determined the weights to be attached by country i to other countries because country i either exports or imports a primary product h , the weights must be aggregated over primary products. The primary product export weights, $WXP(i,j)$, and the primary product import weights, $WMP(i,j)$, are as follows:

$$WXP(i,j) = \sum_h \cdot \frac{XP(h,i)}{\sum_h XP(h,i)} \cdot WP(h,i,j)$$

$$WMP(i,j) = \sum_h \cdot \frac{MP(h,i)}{\sum_h MP(h,i)} \cdot WP(h,i,j)$$

4. Aggregation

Using the formulas given above, four sets of weights are produced for each country, " i ". The following totals are needed to form aggregate weights:

$$\sum_h \sum_j MM(h,i,j) = MM(i) = \text{total imports of manufactured goods};$$

$$\sum_h \sum_k XM(h,i,k) = XM(i) = \text{total exports of manufactured goods};$$

$$\sum_h MP(h,i) = MP(i) = \text{total imports of primary products};$$

$$\sum_h XP(h,i) = XP(i) = \text{total exports of primary products};$$

Let:

$$WMM(i,j) = \text{the weight given to country } j \text{ for imports of manufactures by country } i.$$

$$WXM(i,j) = \text{the weight given to country } j \text{ for exports of manufactures from country } i.$$

$WMP(i,j)$ = the weight given to country j for imports of primary products by country i .

$WXP(i,j)$ = the weight given to country j for exports of primary products from country i .

$TT(i)$ = $MM(i) + XM(i) + MP(i) + XP(i)$ = total trade of country i .

$\alpha(i)$ = $MM(i)/TT(i)$

$\beta(i)$ = $XM(i)/TT(i)$

$\pi(i)$ = $MP(i)/TT(i)$

The aggregate weight $AW(i,j)$ is:

$$AW(i,j) = \alpha(i) \cdot WMM(i,j) + \beta(i) \cdot WXM(i,j) + \pi(i) \cdot WMP(i,j) + [1 - \alpha(i) - \beta(i) - \pi(i)] \cdot WXP(i,j).$$

5. Data used in the computation of weights

Data for trade in manufactures are United Nations' data from the World Bank's Trade System. The assembled data base covers SITC groups 5 through 8, but excludes non-ferrous metals (SITC 68), since the latter are treated as primary products. Disaggregation is taken to the SITC two-digit level. For most countries, the weights have been computed using average trade flow data for the 1980-82 period. Considerable lags occur in the reporting of such disaggregated data to the U.N. (particularly by developing countries) and this factor acts as a constraint on the period that can be used in the computation of weights.

For primary products, the data base includes trade in over 100 commodities and also covers the 1980-82 period. The data are drawn mainly from files maintained by the World Bank's Commodities Division, supplemented by U.N. and trade association sources. Except in the case of sugar, the data base contains the total value of each country's imports and exports of the commodities considered; i.e., the origin or destination, respectively, of such trade is not distinguished. Trade in energy products (crude petroleum, refined petroleum products, natural gas, and electricity) is excluded. The commodities were selected to ensure that trade in the most important primary commodities is included; nevertheless, the coverage is not fully comprehensive.

For Jamaica, the Bahamas, Barbados, Fiji, Mauritius, Morocco, Seychelles, and Tunisia, a further adjustment is made to the weights in order to take account of competitiveness in tourism.

6. Truncation procedure

Unlike the type II and III weighting schemes used in previous reports, the weights for each country are now computed with no prior restrictions on the number or type of countries to be considered as potential competitors. However, this means that the number of partners included in the set of weights for any given country is potentially very large. Thus, the weighting scheme for each country has been truncated so that partners with the smallest computed weights are eliminated in the actual calculation of effective exchange rates. All weights greater than 2 percent are automatically included. If the sum of such weights is greater than or equal to 80 percent, then this set of weights is accepted and normalized so that the resultant weights sum to unity. If not, weights (in decreasing order of magnitude) are added until the 80 percent criterion is satisfied, or until the number of countries reaches 20. ^{1/}

7. Country coverage of the revised index

The revised type II index has been calculated for the smaller industrialized countries and for all developing countries, with the exceptions of:

Antigua and Barbuda	Botswana	Chad	Burkina Faso
Dominica	Lesotho	Bhutan	Mali
Grenada	Swaziland	Mozambique	Niger
St. Christopher and Nevis	Luxembourg	Nepal	Senegal
St. Lucia	Netherlands Antilles		
St. Vincent			

For these countries, difficulties were experienced in obtaining the requisite disaggregated trade flow data. In the case of countries in the Eastern Caribbean region, the problem stems from the practice of several important countries supplying manufactures to these countries of reporting data only for an aggregate covering the member countries, together with other geographical entities. However, indices for these countries were introduced relatively recently using data on trade and tourism for the 1980-82 period and taking account of factors deemed particularly important in evaluating their competitiveness. For Luxembourg and for Botswana, Lesotho, and Swaziland, the geographical and commodity data required are readily available only for the customs union to which these members belong, the Belgium-Luxembourg Economic Union (BLEU) and the Southern African Customs Union (SACU), respectively. In the computation of the weighting schemes, trade flows of BLEU and SACU have been attributed to the dominant members, Belgium and the Republic of South Africa, respectively. For the remaining member countries, it is hoped that in the course of missions the data problems can be resolved.

^{1/} In the case of Greece, the criterion was set at 85 percent.

The weights previously used in this report will be retained for the listed countries; the exchange rate indices will be the type III indices described in quarterly reports up to and including that of September 5, 1986 (EBS/86/208).

8. Price data used

For both the revised type II index and the type III index, the real effective exchange rate is based on monthly consumer price indices. Consumer price indices have the advantage of being relatively timely and easy to obtain, but their reliability as an indicators of how underlying cost trends are evolving in different countries may be limited by the extent of subsidization and price control. The price data are normally obtained from International Financial Statistics (IFS) (line 64), but in some cases other CPI indices or wholesale price indices are used. 1/ To the extent that lags exist in the available series, updating of price data is based on extrapolative procedures and staff estimates. The staff also seasonally adjust the data. 2/ The data on exchange rates are also normally obtained from IFS (line ah). For some countries with multiple exchange rates, the calculations are based on an appropriately weighted average of the various rates.

The formula used to average the bilateral real exchange rates is the same as formula (1) (p. 18). For certain countries, reliable price data are not available so that a real effective exchange rate cannot be calculated. In these cases, calculation is confined to the nominal effective exchange rate, but the usefulness of this nominal effective exchange is limited because of marked differences in inflation rates among countries. 3/ It is hoped that real effective exchange rate indices can be developed eventually for all Fund member countries.

1/ For India, the Central African Republic, and Costa Rica, use is made of the wholesale price index which is considered as better suited to the present exercise. For Brazil, the general price index--domestic supplies (GPI, a composite index of wholesale and retail price and construction cost indices) is used. For Malawi and Zimbabwe, the price index is a composite of various local price indices for differing income groups.

2/ Data for Bolivia and China are not seasonally adjusted, owing to the absence of a stable seasonal pattern.

3/ For one member country (Kampuchea) neither the nominal nor the real effective exchange rate is calculated.

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