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PRICE-ADJUSTED NATIONAL INCOME DATA: ANALYSIS OF THE IMPACT OF
INFLATION ON THE COMPARABILITY OF NATIONAL INCOME STATISTICS IN
UNITED STATES DOLLARS

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1. The present study is a follow-up to the price-adjusted rate of exchange (PARE) studies that were prepared earlier and presented to the Committee on Contributions. These PARE factors were used by the Committee to make adjustments to national income data in United States dollars of individual countries, when unco-ordinated movements of prices and exchange rates led to severe distortions in the national and per capita income figures that were used in calculating their rate of assessment.

A. Aim and coverage of present study

2. The present study is in immediate response to the need to develop more systematic methods to make adjustments to national income data. Such systematic methods may well become necessary at the time of the 1988 revision of the scale because of very volatile inflation rates and exchange rate changes which have been observed in the past few years in several countries. If this trend continues, the Committee may not be able to proceed with its policy of ad hoc adjustments which might be numerous in 1988 because the removal of distortions with respect to some countries may result in distortions of assessment rates of other countries whose data have not been adjusted.

3. The objective of the paper is to explain in more detail the adjustment methods that could be applied. It is hoped that this may allay previous concerns of Committee members that the suggested methods were too simple and rough and thus could not adequately take into account the very complex criteria which Governments use to fix exchange rate levels or the very complex processes of market forces that determine the movements of exchange rates over time.

4. Distortions in national and per capita income levels are identified as a consequence of changes in exchange rates which do not adequately reflect the domestic inflation rates vis-à-vis other countries. What is new in the present paper is that the PARE adjustment factors are no longer calculated as average factors between the last, say, 10 years and a base period of the same length. The average method made it very difficult to match adjustment factors with annual price changes and movements of exchange rates. Therefore, in this paper adjustment factors derived on an annual basis are a function of the index of national income in United States dollars relative to the index of real growth, given a fixed base year. The adjusted data can then be compared annually with unadjusted data. Another advantage is that the annually adjusted income figures can be compared with similarly adjusted data published by the World Bank in the World Atlas.^{1/} This comparison is done in the last section of this paper. What is not dealt with in this paper are the resulting assessment scales based on the PARE-adjusted income levels. This information will be presented in a conference room paper during the session.

5. While data are available for all countries, the present analysis is restricted to a limited number of countries only in order to keep evaluation and comparison of data within manageable bounds. The countries are selected from different regions and economic systems and different per capita income groups and include countries with volatile price and exchange rate developments as well as countries where these trends have been much more controlled and smooth over time.

B. Price and exchange rate distortions in national and per capita income levels

6. Exchange rates fulfil their function in an ideal sense if they reflect the relative price levels between pairs of countries and if they change over time in close correlation with changes in the relative prices in each of two countries that are compared.

7. A simple quantitative example presented in table 1 below may illustrate what relations there are in an equilibrium situation between the price levels in two countries and the exchange rates between their currencies. The example uses fictitious production and price levels of one good in France and the United States in 1975 and 1984. The exchange rate in 1975 of 6 French francs to 1 United States dollar corresponds to the ratio between the respective unit prices of the product in France (30 francs) and the United States (5 dollars). As a result, the ratio between the 1975 production levels in both countries in quantities as well as in United States dollar values is equal ($300/100 = 1500/500$). If there is an annual inflation in France of 5 per cent and in the United States of 3 per cent, the unit price rises between 1975 and 1984 in the United States from \$5 to \$6.52 and in France from Fr. 30 to Fr. 46.54. The equilibrium exchange rate should reflect the higher inflation in France as compared with the United States by increasing the number of francs required per dollar in 1984 to 7.13. This new exchange rate in 1984 corresponds again to the ratio between the new unit prices in both countries ($46.54/6.52 = 7.13$). With this exchange rate in 1984, the higher inflation in France would not distort the relative levels of production in United States dollar terms vis-à-vis the relative levels in physical terms. In quantities as well as in United States dollar values, the production in the United States in 1984 is 67 per cent higher than in France ($3262/1957 = 500/300 = 1.67$).

Table 1

EXAMPLE SHOWING THE QUANTITATIVE RELATION BETWEEN PRODUCTION LEVELS, UNIT PRICES AND PRODUCTION VALUES IN LOCAL CURRENCY AND UNITED STATES DOLLARS AND EXCHANGE RATES, BASED ON ILLUSTRATIVE DATA FOR FRANCE AND THE UNITED STATES, AND ASSUMING FOREIGN TRADE EQUILIBRIUM

	1975		1984	
	United States (\$US)	France (French francs)	United States (\$US)	France (French francs)
Number of units produced	300	100	500	300
Price/unit, local currency	5.00	30.00	6.52	46.54
Value of production, local currency	1 500	3 000	3 262	13 962
Exchange rate, local currency/\$US	1	6.00	1	7.13
Value of production in \$US	1 500	500	3 262	1 957

8. In practice, the equilibrium situation described above will hardly ever apply. Either the exchange rates will not adequately reflect relative price levels in the base year (in the example, 1975) or in the current year (1984), or none of these years' exchange rate will reflect relative price levels between countries. If the exchange rate is higher than the price relatives, France's income in United States dollars (in the example) will be too low relative to the United States income, and if the exchange rate is too low, France's income will be inflated relative to the income level in the United States.

9. Trade surpluses or deficits will result from distortions in the exchange rates. High exchange rates of the United States dollar in terms of French francs will give France a competitive advantage over the United States, which might result in United States trade deficits and surpluses in France. In theory, this would increase the supply of dollars in France (and also in France's trading partners) and then reduce the dollar value, which would subsequently lead to a return to the state of equilibrium described earlier. In practice, this does not happen for several reasons.

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10. One reason is that the exchange rate is not only determined by international trade, i.e., exports and imports of goods and services. This is only a portion of the transactions in which foreign currencies are exchanged. Supply and demand of foreign currencies and their price - i.e., the exchange rate - are also influenced by other international transactions such as investments abroad and loans received from abroad, investment income received by residents from investments in other countries and investment income paid to foreign investors, remittances paid to non-resident workers and those received by resident workers that are temporarily employed abroad, current and capital transfers between Governments and other residents and non-residents. The additional transactions allow countries to maintain exchange rates that do not reflect price relatives - even for longer periods of time. Such situations can continue as long as the resulting trade deficits in some countries are supported by other current or capital inflows that make up for the reduction in the foreign currency reserves and trade surpluses are accompanied by outgoing current and capital flows.

11. While exchange rates therefore may not adequately reflect differences in price levels of internationally traded goods, they are even less effective as a means of comparing price levels of goods and services that are not internationally traded or do not make use of internationally traded raw materials. This applies to the majority of services, as well as to a considerable number of goods. The latter generally include products of the construction industry, electricity and gas produced by public utilities and also applies to many agricultural products and manufactured goods that are produced by traditional production methods. The extent to which international prices determine relative price levels in a country as compared with other countries depends on the size of the traditional economy and also on the size of the country. Large countries are generally more self-supporting than small countries and depend relatively less on exports and imports.

12. Explicit government measures with regard to exchange rates may either reduce or increase the distortions as compared with what they would be if only market forces prevail. In the long run, Governments may be forced to accept modifications of the official exchange rates because of market realities. For instance, the Bretton Woods Agreements which fixed exchange rates between the currencies of major industrial countries had to be abandoned because of unacceptable balance-of-payment deficits for longer periods of time resulting in some countries in the drawing down of their foreign currency reserves. Governments of centrally planned economies and also those of developing countries with non-convertible currencies often fix the exchange rate of their currency vis-à-vis the dollar by government decree. In the long run, however, they generally have had to modify those rates, either explicitly or implicitly. Explicitly, when parallel markets develop where United States dollars or other convertible currencies are exchanged for local currencies at rates much higher than the official ones, which has forced Governments of many developing countries to adjust the official rates of exchange. In countries with centrally planned economies, often no explicit changes in the exchange rates are made because all purchases and sales of convertible currencies are channelled through the Government and official rates only have nominal significance. Instead, the trade balance of those countries reflects changes in export and import prices. For

instance if less convertible currencies are received for exports and more have to be paid for imported goods and services, the import volume will have to be reduced if export volume remains the same.

13. The extent of the distortions is reflected in table 2, given at the end of the text. This table presents for 15 selected countries during the period 1975-1984 a decomposition of the annual changes in national income according to volume, price and exchange rate movements expressed in index numbers with 1975 = 100. Columns 1 and 2 list total and per capita national income; column 3 shows the real growth of gross domestic product (GDP) in terms of volume; columns 4 and 5 compare price changes in terms of United States dollars and national currencies respectively; and column 6 reflects the annual development in exchange rates since 1975. (National income data for China were preconverted from the yuan to United States dollars so as to include the estimates for Taiwan. This explains the 100.0 index shown for China in column 6.)

14. As described in paragraph 7, if an approximate equilibrium exists between international prices, the price indexes in terms of United States dollars shown in column 4 for each country would reflect the price movements in the United States. For those with higher dollar price index than 178.8 in 1984 over 1975, total and per capita national income expressed in United States dollars might be inflated by the extent of this difference, and for those whose price indexes are lower than the United States, the reverse is probably true. This implies that, if one compares the growth of per capita income with that of GDP at constant prices, the differences could mainly be attributed to the price factor expressed in United States dollars since population growth is not generally subject to rapid movements that could affect changes in per capita income to a large extent. The analysis focuses on per capita instead of total national income because the former's development does not generally produce very rapid changes over time and therefore the relative levels between countries do not normally change very rapidly either.

15. Thus, for most of the countries which have relatively high rates of inflation, per capita income expressed in current dollars exhibits a more rapid growth than real growth of GDP. For example, Argentina has 80 per cent growth in per capita income compared to only a 3.5 per cent real growth of GDP between the years 1975 and 1984; Colombia has corresponding growths of 121 and 39.6 per cent; India shows growth rates of 76 and 43.4 per cent respectively, etc. The exception is for four countries whose national income values grew less than their volume: the Union of Soviet Socialist Republics, Hungary, Kenya and Kuwait. For these countries, the "hold-back" in nominal growth of national income between 1975 and 1984 was due partly to an over-correction in their currencies viz. the United States dollar that more than compensated for the increases in domestic prices, with the values of the Hungarian forint and Kenyan shilling appreciating by approximately one half their levels in 1975. Corrections in exchange rates have helped to offset domestic price increases which allowed reductions below the 1975 levels of dollar inflation for the USSR and Hungary for the comparable periods 1974 and 1984. Although domestic price change was relatively modest in the USSR (6.4 per cent), the downward movement in the rouble conversion of -11 per cent further eliminated whatever inflation in United States dollars there was; in Hungary and Kenya, there was an over-reaction to domestic inflation rates of 56 and 146 respectively evidenced by the aforementioned steep decline in their rates of exchange. The correction

totally negated dollar inflation in Hungary and reduced that of Kenya significantly, resulting in growth of per capita incomes lower than GDP at constant prices. In Kuwait's case, on the other hand, the exchange rate reaction to domestic price movements was not sufficient to hold its dollar inflation below 63.4 per cent of the 1975 level. Despite this comparatively steep rate, the development of per capita income has not kept up with the real growth of GDP.

16. Upward changes in exchange rates in the form of currency depreciation are theoretically necessary to cope with domestic inflation pressures in order to maintain a country's competitive leverage on its export products in the international market and at the same time make imports less attractive, price-wise. Given that inflation rates have been higher than in the United States for most of the countries listed in table 2, with few exceptions, movements in exchange rates have been on a downward trend particularly for the period 1981-1984 when the United States dollar was strongest. This has led to corrections in price changes in terms of the dollar although results vary between groups of countries. Some corrections have properly eased inflation in United States dollars; others have been over-reactions resulting in dollar figures that are too low; and still others have not made adequate corrections and as a result show inflated dollar figures. For instance in countries like Bolivia, the Islamic Republic of Iran, Colombia and India to some extent, exchange rates have responded to price movements relatively well as witness the gradual dollar price changes in column 4 in parallel with the price index in the United States. On the other hand, for countries like France and Italy, the changes in exchange rates have over-reacted at times to the domestic price movements resulting in distortions in the dollar inflation, particularly in the period 1981-1984.

C. PARE adjustments of actual exchange rates

17. It is obvious that systematic adjustments of national and per capita income data are needed in order to redress the relatively large number of distortions found in table 2 and confirmed by a more extensive analysis of all countries' data. Adjustments should be made to the exchange rate so that the modified exchange rate approximates better the price relatives between countries, while at the same time the trend of modified national income in United States dollars matches more closely the trend of real GDP.

18. The PARE adjustments described in previous papers submitted to the Committee have at least one of the two effects. The PARE method derives an adjustment factor by which national income is divided in order to obtain a modified value from which price and exchange rate distortions are eliminated. The adjustment factor for each country is equal to the local price index relative to the United States price index and multiplied by an index of exchange rate changes, all based on the same base year. The adjusted value of national and per capita income could be interpreted to result from the use of a modified exchange rate, after dividing the actual exchange rate by the PARE adjustment factor. It can also be shown that the adjusted rate of exchange is equal to the rate of exchange in the base year, extrapolated to the present year on the basis of a domestic price index relative to the United States rate of inflation, and that the resulting trend of adjusted national income matches the growth of real GDP after incorporation of United States inflation.

19. The base year used in the calculations in this paper is 1975. This is the base year for which most constant price data are available to the Statistical Office. The selection of 1975 as a base year introduces two assumptions that should be taken into account in assessing the relevance of the adjustments. First of all, it is assumed that the base year exchange rates are in equilibrium and adequately reflect price relatives between countries. It is further assumed that the composition of each country's national income in terms of goods and services produced - on which the price relatives are based - is similar to the composition in subsequent years. It is obvious that the latter assumption becomes less valid when the year in question is farther away from the base year.

20. The United States price index is used as a frame of reference as exchange rates of local currencies are expressed in United States dollars and national and per capita incomes are converted to United States dollars. The use of the United States price index determines the level of adjusted national and also per capita income. The latter is of immediate relevance to the assessment scale formula as this includes a per capita income limit which is expressed in United States dollars.

21. The effects of the PARE adjustments are presented in table 3, which shows the results of modifying total and per capita national income with the use of the adjustment factor defined in the preceding paragraph. The derivation is as follows: in column 4 of table 2, take for example Argentina's rate of dollar inflation index (200.7) for 1984 in relation to 1975; this is divided by the corresponding index for the United States (178.8) to arrive at an adjustment factor equal to 1.122 per cent which represents the higher rate of dollar inflation in Argentina *viz.* the United States in 1984 over 1975. This adjustment factor is then used to divide Argentina's national income of \$69.6 billion to come up with a price-adjusted national income of \$62 billion as shown in column 3 of table 3. Another way of doing this is by taking Argentina's real growth of GDP of 3.5 per cent (column 3 of table 2) and inflating it by the price increase in the United States amounting to 78.8 per cent (column 4) and multiplying the 1975 national income of \$33.5 billion to arrive at the adjusted figure of \$62 billion. Either way, it could be seen that for Argentina at least, the adjusted national income provides a smoother movement over time as a result of using the PARE methodology.

22. One finds that for countries where domestic inflation has been corrected by changes in exchange rates resulting in a dampening of price increases in terms of United States dollars, if this correction is sufficient enough to hold these countries' dollar inflation levels below that of the United States, their adjusted national incomes present more measured changes that are reflected in per capita income as well. This is true for countries like Argentina, Bolivia, Colombia and the Islamic Republic of Iran. Conversely, for countries with dollar price changes lower than the United States, i.e., with adjustment factors below 100.0, the rates of increase in adjusted total and per capita national income are more pronounced as is evident in the cases of some countries like France, Hungary and Argentina. In both cases, however, the erratic movements in levels of total and per capita national income caused by domestic price changes that are not well reflected in adjustments of the exchange rates are largely diminished as a result of the PARE adjustment.

23. The overall assessment of the PARE method is that the changes over time of PARE-adjusted levels of national and per capita income are much less erratic than the movements of unadjusted time series. The erratic movement was one of the reasons why the Committee adopted longer base periods, utilizing averages instead of actual values of incomes. An implication of using PARE-adjusted income levels therefore would be that the base period could be reduced to a shorter period.

D. World Bank method of United States dollar conversion

24. The World Bank, for purposes of presenting per capita income figures expressed in United States dollars in the World Atlas, uses a method very similar to PARE to adjust exchange rate levels. However, the results are very different because of different assumptions regarding the base year. PARE uses one base year - in this paper 1975 - and recalculates the exchange rate for each subsequent year, taking into account the inflation rate since the base year. The World Bank method assumes that there are three different base years for each United States dollar conversion: for one third of income generated in production, it assumes that the actual exchange rate is the equilibrium rate, for another third of production income, the equilibrium rate of exchange is the one of last year, and for the remaining third the equilibrium exchange rate is the one of two years ago. In other words, each year's conversion rate, according to the World Bank method, is an unweighted average of the actual exchange rate of that year and the rates of last year and the year before, both adjusted for inflation since then. 2/

25. To illustrate the effect, some countries have been recalculated on the basis of the World Bank method. Table 4 shows a comparison for four countries between the World Bank and PARE-adjusted national income and per capita incomes and also confronts the information with the unadjusted national and per capita income figures. In addition, it includes in a last line for each country the average values of national and per capita income. The four countries selected represent each a distinct type of price and exchange rate development: a developing country (Argentina) with cyclical movements of prices and delayed effects of exchange rates; another developing country (India) with continuous increases of domestic prices and delayed reactions of exchange rates; a centrally planned economy (USSR) with continuous reductions of relative domestic prices vis-à-vis the prices in the United States and an exchange rate development which does not well reflect these domestic price developments; a developed country (France) with a typical sharp reduction in its national and per capita income since 1981 as a result of considerable increases in the value of the dollar vis-à-vis the European currencies since that year.

26. When comparing the results in table 4, it appears that the PARE method is much more effective than the World Bank method in eliminating the erratic movements of national and per capita income that result from unco-ordinated price and exchange rate developments. In the case of PARE, most countries presented in table 4 show a smooth development of national and per capita income over time. In the case of Argentina and France, the World Bank method leads to similar cyclical movements as the unadjusted data, except with a delay of one year in both countries. In the

Argentinian case, the cyclical movements are dampened as compared with the unadjusted figures, while for France the movements are amplified as a result of the World Bank adjustment.

27. There is no definite relation for individual years between the level of national and per capita income unadjusted and the adjusted levels based on the PARE or World Bank methods. Not only this relation varies between countries but also between years. The only exception is the USSR where World Bank-adjusted data are for all years higher than the unadjusted levels of per capita and national income and lower than the PARE-adjusted levels. On the other hand, there is a more definite relation between the unadjusted averages and the PARE- and World Bank-adjusted averages of national and per capita income. For three of the four countries - Argentina, France and India - the averages according to the World Bank method are higher than the PARE-adjusted averages and also higher than the unadjusted averages of national and per capita income. Only in the case of the USSR, World Bank-adjusted averages are lower than the PARE-adjusted averages but still higher than the unadjusted averages of national and per capita income. This leads to the conclusion that one cannot simply take World Bank-adjusted data of some years for which they are lower, as the Committee has done in the past, because of the complex relations that exist between the World Bank- and PARE-adjusted and unadjusted national and per capita income data.

E. Conclusions

28. The conclusion of the previous evaluation of the basic principles and the data resulting from the World Bank method is that this method is less adequate for the purposes of the Committee. The continuous movement of base years inherent in the World Bank method aims at comparability of data between countries in successive periods, but not necessarily results in comparability over time. In fact, it leads to rather erratic movements of national and per capita income in some countries with fluctuations that are sometimes less, sometimes even more than the fluctuations of the unadjusted data. This feature of the World Bank method is inconvenient for the purposes of the Committee as the Committee actually has tried to stabilize national and per capita income movements over time. The PARE-adjustment method serves much better the aims of the Committee as it uses one base year and results in fairly stable movements over time of adjusted national and per capita income data.

29. Obviously, the PARE method has the basic deficiency that not necessarily all exchange rates of the base year are equilibrium rates and, even if they are, they may not be relevant for the present composition of national income and product. As has been argued in a previous study presented to the Committee in 1984, ^{3/} the deficiencies can only be removed if the use of purchasing power parities (PPPs) is accepted to replace the exchange rate in the base year and to use PARE to extrapolate PPPs to more recent years. As long as the PPP conversion is not accepted, the PARE method based on actual exchange rates in a selected base year seems to be the next best choice. This is particularly so if one may assume that the Committee has agreed that the base year exchange rates have resulted for the base period in an acceptable distribution of national income between countries and acceptable rates of assessment.

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30. Another deficiency of the present PARE method is that it does not take into account in the adjusted income levels, changes in the terms of trade. As these changes have similar effects on income as increases in domestic production levels and are particularly relevant for countries with heavy reliance on exports and/or imports, it is the intention of the Statistical Office to make a special study of this and incorporate the effects in an adaptation of the PARE-adjustment method for the 1987 session of the Committee.

Notes

1/ World Bank Atlas, 1985, World Bank, Washington, D.C.

2/ Ibid., p. 28.

3/ Study of alternative assessment methodologies based on the use of price-adjusted rates of exchange and purchasing power parities, A/CN.2/R.480, May 1984.

Table 2

VALUE, VOLUME AND PRICE INDICES OF NATIONAL AND PER CAPITA INCOME
FOR SELECTED COUNTRIES, 1975-1984

COUNTRY AND YEAR	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	INDEX OF CHANGES IN NATIONAL INCOME AND ITS ELEMENTS			
			GDP CONSTANT INDEX	PRICES		
				IN \$US	IN NATIONAL CURRENCY	EXCHANGE RATE
(1)	(2)	(3)	(4)	(5)	(6)	
UNITED STATES						
1975	1 369.1	6 339.3	100.0	100.0	100.0	100.0
1976	1 522.7	6 983.6	104.7	106.2	106.2	100.0
1977	1 700.4	7 720.7	110.5	112.4	112.4	100.0
1978	1 912.4	8 591.4	115.7	120.7	120.7	100.0
1979	2 128.1	9 455.5	118.7	131.0	131.0	100.0
1980	2 305.5	10 125.1	118.2	142.5	142.5	100.0
1981	2 597.7	11 301.6	122.2	155.3	155.3	100.0
1982	2 675.1	11 527.5	118.6	164.8	164.8	100.0
1983	2 885.9	12 306.5	122.1	172.7	172.7	100.0
1984	3 202.0	13 528.9	130.8	178.8	178.8	100.0
USSR						
1975	554.4	2 178.6	100.0	100.0	100.0	100.0
1976	561.9	2 188.5	106.0	95.6	99.9	95.8
1977	602.4	2 325.5	111.0	97.9	100.1	97.8
1978	684.9	2 621.6	116.0	106.5	100.8	105.7
1979	737.1	2 798.1	119.0	111.7	101.4	110.2
1980	780.0	2 937.6	124.0	113.5	101.7	111.6
1981	747.7	2 792.8	133.0	101.4	100.7	100.7
1982	795.2	2 944.6	139.0	103.2	103.5	99.7
1983	813.9	2 986.8	144.0	102.0	104.1	98.0
1984	764.6	2 780.5	146.0	94.5	106.4	88.8
ARGENTINA						
1975	33.5	1 286.0	100.0	100.0	100.0	100.0
1976	50.6	1 909.8	99.6	151.6	530.5	28.57
1977	47.8	1 777.4	105.9	134.8	1 381.8	9.76
1978	61.3	2 240.9	102.3	178.8	3 575.1	5.00
1979	101.4	3 648.3	109.1	277.5	9 157.5	3.03
1980	144.5	5 116.9	110.3	391.2	17 995.3	2.17
1981	113.1	3 941.0	103.1	327.3	35 997.7	0.91
1982	50.5	1 732.1	97.8	154.2	99 915.4	0.15
1983	60.4	2 037.0	101.1	178.3	469 321.2	0.04
1984	69.6	2 311.2	103.5	200.7	3 393 499.0	0.01

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Table 2 (continued)

COUNTRY AND YEAR	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	INDEX OF CHANGES IN NATIONAL INCOME AND ITS ELEMENTS			
			GDP CONSTANT INDEX	PRICES		
				IN \$US	IN NATIONAL CURRENCY	EXCHANGE RATE
(1)	(2)	(3)	(4)	(5)	(6)	
BOLIVIA						
1975	2.3	470.1	100.0	100.0	100.0	100.0
1976	2.6	518.3	106.1	108.0	108.0	100.0
1977	3.0	574.5	110.6	117.6	117.6	100.0
1978	3.5	652.8	114.3	133.0	133.0	100.0
1979	4.0	742.7	116.4	152.8	155.8	98.1
1980	4.6	829.3	117.0	174.4	213.7	81.6
1981	5.5	954.3	115.9	208.4	255.3	81.6
1982	5.0	851.7	105.8	209.4	668.1	31.3
1983	4.9	801.2	97.8	219.0	2 515.6	8.7
1984	5.9	951.1	96.4	270.8	3 133.6	8.6
CHINA						
1975	162.2	173.8	100.0	100.0	100.0	100.0
1976	153.3	161.5	97.3	97.1	97.1	100.0
1977	173.8	180.3	104.9	102.1	102.1	100.0
1978	219.9	224.9	117.8	115.1	115.1	100.0
1979	264.1	266.7	126.0	129.2	129.2	100.0
1980	309.0	308.2	134.1	142.1	142.1	100.0
1981	301.1	296.6	140.7	132.0	132.0	100.0
1982	298.2	290.2	152.3	120.7	120.7	100.0
1983	311.7	299.8	166.2	115.6	115.6	100.0
1984	365.9	348.0	185.6	121.5	121.5	100.0
COLOMBIA						
1975	11.9	523.6	100.0	100.0	100.0	100.0
1976	13.8	588.7	104.7	110.5	123.9	89.1
1977	17.6	731.2	109.1	135.6	161.3	84.1
1978	21.1	855.7	118.3	149.8	189.4	79.1
1979	25.3	997.3	124.7	170.3	234.4	72.7
1980	30.2	1 160.0	129.8	195.6	299.1	65.4
1981	32.7	1 224.6	132.7	207.2	365.2	56.8
1982	34.7	1 278.0	134.0	217.9	451.7	48.2
1983	34.3	1 245.7	135.3	213.0	543.0	39.2
1984	32.6	1 155.2	139.6	196.2	639.6	30.7

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Table 2 (continued)

COUNTRY AND YEAR	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	INDEX OF CHANGES IN NATIONAL INCOME AND ITS ELEMENTS			
			GDP CONSTANT INDEX	PRICES		
				IN \$US	IN NATIONAL CURRENCY	EXCHANGE RATE
(1)	(2)	(3)	(4)	(5)	(6)	
FRANCE						
1975	303.0	5 739.7	100.0	100.0	100.0	100.0
1976	311.0	5 879.3	105.2	97.6	108.8	89.7
1977	342.1	6 445.0	108.4	104.2	119.4	87.2
1978	423.5	7 948.1	112.5	124.3	130.8	95.0
1979	513.0	9 592.0	116.2	145.7	144.7	100.7
1980	584.1	10 875.0	117.4	164.2	161.9	101.4
1981	507.5	9 402.5	118.0	142.0	180.0	78.9
1982	479.6	8 845.8	120.1	131.8	202.1	65.2
1983	456.3	8 349.9	121.0	124.5	221.4	56.2
1984	432.6	7 872.4	122.6	116.5	237.5	49.0
GHANA						
1975	2.7	508.9	100.0	100.0	100.0	100.0
1976	5.3	604.1	96.5	128.6	128.6	100.0
1977	9.2	1 018.2	98.7	218.4	218.4	100.0
1978	13.3	1 880.3	107.0	291.5	384.0	75.9
1979	9.8	2 441.0	104.3	220.6	527.6	41.8
1980	14.9	3 552.9	105.5	330.3	789.9	41.8
1981	27.2	6 283.0	101.5	622.7	1 489.1	41.8
1982	31.6	7 105.6	95.3	775.8	1 855.1	41.8
1983	53.9	1 462.6	96.0	1 312.0	3 934.9	33.3
1984	7.5	20 370.4	102.0	172.3	5 293.8	3.3
HUNGARY						
1975	20.4	1 937.3	100.0	100.0	100.0	100.0
1976	11.2	1 060.8	103.0	53.3	106.0	50.3
1977	12.5	1 178.0	110.3	55.6	108.8	51.1
1978	14.6	1 368.6	114.7	62.3	112.8	55.2
1979	16.3	1 528.0	116.0	68.9	117.2	58.8
1980	18.4	1 721.0	115.0	78.4	121.9	64.3
1981	18.5	1 731.6	117.9	76.9	126.1	61.0
1982	19.3	1 806.2	121.0	78.2	136.9	57.1
1983	17.8	1 665.7	121.4	71.7	146.3	49.0
1984	17.2	1 615.3	124.3	67.8	155.6	43.5

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Table 2 (continued)

COUNTRY AND YEAR	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	INDEX OF CHANGES IN NATIONAL INCOME AND ITS ELEMENTS			
			GDP CONSTANT INDEX	PRICES		
				IN \$US	IN NATIONAL CURRENCY	EXCHANGE RATE
(1)	(2)	(3)	(4)	(5)	(6)	
INDIA						
1975	82.2	131.4	100.0	100.0	100.0	100.0
1976	82.7	129.5	101.1	99.5	106.4	93.5
1977	94.2	144.5	109.3	104.8	109.3	95.8
1978	110.0	165.4	116.6	114.7	112.2	102.2
1979	121.6	179.4	110.9	133.4	129.4	103.1
1980	146.7	212.2	118.4	150.7	141.4	106.5
1981	154.0	218.6	124.6	150.3	155.4	96.7
1982	156.7	218.3	128.1	148.8	168.0	88.6
1983	172.6	235.8	137.9	152.3	183.6	82.9
1984	172.8	231.4	143.4	146.5	198.8	73.7
IRAN (ISLAMIC REPUBLIC OF)						
1975	48.0	1 438.0	100.0	100.0	100.0	100.0
1976	59.4	1 742.9	118.3	104.7	108.7	96.3
1977	71.0	2 046.2	121.6	121.7	127.0	95.8
1978	71.8	1 987.3	104.5	143.5	149.6	96.0
1979	81.8	2 198.9	95.2	179.1	186.6	96.0
1980	90.0	2 347.3	81.8	229.4	239.5	95.8
1981	95.1	2 404.5	83.1	238.7	276.4	86.4
1982	113.4	2 780.4	95.7	247.1	305.4	80.9
1983	140.3	3 335.8	108.2	270.5	345.3	78.3
1984	151.4	3 488.3	108.2	291.9	388.5	75.1
ITALY						
1975	171.4	3 091.6	100.0	100.0	100.0	100.0
1976	168.5	3 025.8	105.9	92.9	118.4	78.4
1977	192.9	3 449.1	107.9	104.3	141.0	74.0
1978	235.4	4 193.4	110.8	123.9	161.1	76.9
1979	294.1	5 224.7	116.2	147.6	187.9	78.6
1980	358.0	6 344.4	120.8	172.9	226.8	76.2
1981	315.3	5 581.2	121.0	152.1	264.8	57.4
1982	309.6	5 465.3	120.3	150.1	310.9	48.3
1983	312.7	5 501.2	119.8	152.2	354.1	43.0
1984	307.0	5 387.2	122.9	145.7	392.1	37.2

Table 2 (continued)

COUNTRY AND YEAR	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	INDEX OF CHANGES IN NATIONAL INCOME AND ITS ELEMENTS			
			GDP CONSTANT INDEX	PRICES		
				IN \$US	IN NATIONAL CURRENCY	EXCHANGE RATE
(1)	(2)	(3)	(4)	(5)	(6)	
JORDAN						
1975	1.0	520.6	100.0	100.0	100.0	100.0
1976	1.3	641.7	114.1	112.2	116.7	96.1
1977	1.6	753.3	131.7	119.1	122.8	97.0
1978	2.1	950.9	157.3	131.3	126.0	104.22
1979	2.5	1 160.2	169.6	147.2	138.4	106.3
1980	3.2	1 451.1	183.6	173.1	161.7	107.0
1981	3.5	1 558.0	195.1	178.0	184.1	96.7
1982	3.7	1 601.1	209.4	174.4	192.4	90.6
1983	3.9	1 482.3	222.9	172.9	196.8	87.9
1984	3.7	1 377.5	234.0	159.5	192.0	83.1
KENYA						
1975	2.9	216.3	100.0	100.0	100.0	100.0
1976	3.1	220.9	103.8	101.7	115.9	87.8
1977	4.0	276.7	113.6	120.7	136.1	88.6
1978	4.7	315.8	121.9	133.1	140.0	95.1
1979	5.4	353.4	126.6	147.7	150.5	98.1
1980	6.4	381.6	132.7	165.5	167.3	98.9
1981	6.0	347.6	138.0	150.8	185.8	81.2
1982	5.5	307.1	140.3	136.3	202.8	67.2
1983	5.1	272.7	145.6	121.4	220.3	55.1
1984	5.3	268.7	144.7	125.2	245.7	51.0
KUWAIT						
1975	12.5	12 376.2	100.0	100.0	100.0	100.0
1976	14.3	13 356.2	111.7	102.5	103.2	99.3
1977	15.4	13 552.2	115.1	107.6	106.5	101.0
1978	17.5	14 491.4	122.7	114.6	108.7	105.5
1979	26.8	20 806.7	133.8	160.8	153.1	105.1
1980	31.7	23 111.7	120.8	210.0	195.6	107.4
1981	31.0	21 076.2	114.4	217.1	208.9	103.9
1982	24.6	15 673.7	112.9	174.8	173.6	100.7
1983	25.1	15 048.3	119.3	168.9	169.4	99.7
1984	24.8	13 847.6	121.6	163.4	166.8	98.0

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Table 3

UNADJUSTED AND ADJUSTED NATIONAL AND PER CAPITA INCOME
FOR SELECTED COUNTRIES, 1975-1984

COUNTRY AND YEAR	UNADJUSTED		ADJUSTED	
	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)
	(1)	(2)	(1)	(2)
UNITED STATES				
1975	1 369.1	6 339.3	1 369.1	6 339.3
1976	1 522.7	6 983.6	1 522.7	6 983.6
1977	1 700.4	7 720.7	1 700.4	7 720.7
1978	1 912.4	8 591.4	1 912.4	8 591.4
1979	2 128.1	9 455.5	2 128.1	9 455.5
1980	2 308.5	10 125.1	2 305.5	10 125.1
1981	2 597.7	11 301.6	2 597.7	11 301.6
1982	2 675.1	11 527.5	2 675.1	11 527.5
1983	2 885.9	12 306.5	2 885.9	12 306.5
1984	3 202.0	13 528.9	3 202.0	13 528.9
USSR				
1975	554.4	2 178.6	554.4	2 178.6
1976	561.9	2 188.5	624.1	2 430.6
1977	602.4	2 325.5	691.8	2 670.7
1978	684.9	2 621.6	776.4	2 971.7
1979	737.1	2 798.1	863.9	3 279.5
1980	780.0	2 937.6	979.5	3 688.8
1981	747.7	2 792.8	1 144.8	4 275.9
1982	795.2	2 944.6	1 269.8	4 702.4
1983	813.9	2 986.8	1 378.6	5 059.2
1984	764.6	2 780.5	1 447.2	5 262.7
ARGENTINA				
1975	33.5	1 286.0	33.5	1 286.0
1976	50.6	1 909.8	35.4	1 338.3
1977	47.8	1 777.4	39.9	1 482.2
1978	61.3	2 240.9	41.4	1 513.4
1979	101.4	3 648.3	47.8	1 721.7
1980	144.5	5 116.9	52.6	863.8
1981	113.1	3 941.0	53.6	1 869.8
1982	50.5	1 732.1	54.0	1 851.2
1983	60.4	2 037.0	58.5	1 973.2
1984	69.2	2 311.2	62.0	2 059.6

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Table 3 (continued)

COUNTRY AND YEAR	UNADJUSTED		ADJUSTED	
	NATIONAL INCOME	PER CAPITA NATIONAL INCOME	NATIONAL INCOME	PER CAPITA NATIONAL INCOME
	(BILLION \$US)	(\$US)	(BILLION \$US)	(\$US)
	(1)	(2)	(1)	(2)
BOLIVIA				
1975	2.3	470.1	2.3	470.1
1976	2.6	518.3	2.6	509.8
1977	3.0	574.5	2.8	549.3
1978	3.5	652.8	3.1	592.4
1979	4.0	742.7	3.5	636.3
1980	4.6	829.3	3.8	677.7
1981	5.5	954.3	4.1	711.1
1982	5.5	851.7	4.0	670.2
1983	4.9	801.2	3.8	631.9
1984	5.9	951.1	3.9	627.9
CHINA				
1975	162.2	173.8	162.2	173.8
1976	153.3	161.5	167.6	176.5
1977	173.8	180.3	191.3	198.4
1978	219.9	224.9	230.7	236.0
1979	264.1	266.7	267.8	270.4
1980	309.0	308.2	310.0	309.1
1981	301.1	296.6	354.3	349.0
1982	298.2	290.2	407.3	396.4
1983	311.7	299.8	465.7	447.9
1984	365.9	348.0	538.4	512.0
COLOMBIA				
1975	11.9	523.6	11.9	523.6
1976	13.8	588.7	13.2	565.9
1977	17.6	731.2	14.6	606.0
1978	21.1	855.7	17.0	689.6
1979	25.3	997.3	19.4	766.7
1980	30.2	1 160.0	22.0	845.0
1981	32.7	1 224.6	24.5	917.5
1982	34.7	1 278.0	26.3	966.4
1983	34.3	1 245.7	27.8	1 010.2
1984	32.6	1 155.2	29.7	1 052.6

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Table 3 (continued)

COUNTRY AND YEAR	UNADJUSTED		ADJUSTED	
	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)
	(1)	(2)	(1)	(2)
FRANCE				
1975	303.0	5 739.7	303.0	5 739.7
1976	311.0	5 879.3	338.4	6 398.5
1977	342.1	6 445.0	369.2	6 954.8
1978	423.5	7 948.1	411.4	7 722.2
1979	513.0	9 592.0	461.0	8 620.8
1980	584.1	10 875.0	507.0	9 438.8
1981	507.5	9 402.5	554.9	10 282.3
1982	479.6	8 845.8	599.6	11 058.7
1983	456.3	8 349.9	633.0	11 582.1
1984	432.6	7 872.4	664.1	12 085.6
GHANA				
1975	4.3	508.8	4.3	508.8
1976	5.3	604.1	4.4	499.0
1977	9.2	1 018.2	4.7	524.0
1978	13.3	1 880.3	5.5	778.7
1979	9.8	2 441.0	5.8	1 448.9
1980	14.9	3 552.9	6.4	1 532.6
1981	27.0	6 283.0	6.7	1 566.6
1982	31.6	7 105.6	6.7	1 509.4
1983	53.9	14 626.4	7.1	1 925.3
1984	7.5	20 370.4	7.8	21 142.1
HUNGARY				
1975	20.4	1 937.3	20.4	1 937.3
1976	11.2	1 060.8	22.4	2 112.3
1977	12.5	1 178.0	25.4	2 383.7
1978	14.6	1 368.6	28.3	2 654.0
1979	16.3	1 528.0	31.1	2 904.3
1980	18.4	1 721.0	33.5	3 129.2
1981	18.5	1 731.6	37.4	3 495.6
1982	19.3	1 806.2	40.8	3 808.1
1983	17.8	1 665.7	42.9	4 000.7
1984	17.2	1 615.3	45.5	4 262.8

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Table 3 (continued)

COUNTRY AND YEAR	UNADJUSTED		ADJUSTED	
	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)
	(1)	(2)	(1)	(2)
INDIA				
1975	82.2	131.4	82.2	131.4
1976	82.7	129.5	88.2	138.2
1977	94.2	144.5	101.0	155.0
1978	110.0	165.4	115.8	174.1
1979	121.6	179.4	119.4	176.0
1980	146.7	212.2	138.7	200.7
1981	154.0	218.6	159.0	225.7
1982	156.7	218.3	173.6	241.8
1983	172.6	235.8	195.8	267.4
1984	172.8	231.4	210.9	282.4
IRAN (ISLAMIC REPUBLIC OF)				
1975	48.0	1 438.0	48.0	1 438.0
1976	59.4	1 742.9	60.3	1 767.2
1977	71.0	2 046.2	65.6	1 890.5
1978	71.8	1 987.3	60.4	1 671.5
1979	81.8	2 198.9	59.8	1 607.7
1980	90.0	2 347.3	55.9	1 458.0
1981	95.1	2 404.5	61.8	1 564.0
1982	113.4	2 780.4	75.6	1 854.6
1983	140.3	3 335.8	89.6	2 129.9
1984	151.4	3 488.3	92.8	2 137.0
ITALY				
1975	171.4	3 091.6	171.4	3 091.6
1976	168.5	3 025.8	192.8	3 460.6
1977	192.9	3 449.1	207.9	3 717.4
1978	235.4	4 193.4	229.3	4 084.6
1979	294.1	5 224.7	260.9	4 634.6
1980	358.0	6 344.4	295.0	5 228.4
1981	315.3	5 581.2	322.0	5 698.6
1982	309.6	5 465.3	340.0	6 002.2
1983	312.7	5 501.2	354.8	6 241.8
1984	307.0	5 387.2	376.7	6 611.9

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Table 3 (continued)

COUNTRY AND YEAR	UNADJUSTED		ADJUSTED	
	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)	NATIONAL INCOME (BILLION \$US)	PER CAPITA NATIONAL INCOME (\$US)
	(1)	(2)	(1)	(2)
JORDAN				
1975	1.0	520.6	1.0	520.6
1976	1.3	641.7	1.2	607.5
1977	1.6	753.3	1.5	711.3
1978	2.1	950.9	1.9	874.2
1979	2.5	1 160.2	2.2	1 032.2
1980	3.2	1 451.1	2.6	1 194.5
1981	3.5	1 558.0	3.0	1 359.0
1982	3.7	1 601.1	3.5	1 513.4
1983	3.9	1 482.3	3.8	1 480.4
1984	3.7	1 377.5	4.2	1 544.4
KENYA				
1975	2.9	216.3	2.9	216.3
1976	3.1	220.9	3.2	230.7
1977	4.0	276.7	3.7	257.8
1978	4.7	315.8	4.3	286.4
1979	5.4	353.4	4.8	313.3
1980	6.4	381.6	5.5	328.6
1981	6.0	347.6	6.2	357.8
1982	5.5	307.1	6.7	371.3
1983	5.1	272.7	7.3	388.0
1984	5.3	268.7	7.5	383.6
KUWAIT				
1975	12.5	12 376.2	12.5	12 376.2
1976	14.3	13 356.2	14.8	13 833.9
1977	15.4	13 552.2	16.1	14 159.0
1978	17.5	14 491.4	18.5	15 269.0
1979	26.8	20 806.7	21.9	16 941.2
1980	31.7	23 111.7	21.5	15 678.9
1981	31.0	21 076.2	22.2	15 074.0
1982	24.6	15 673.7	23.2	14 779.7
1983	25.1	15 048.3	25.7	15 391.2
1984	24.8	13 847.6	27.1	15 153.7

Table 4

COMPARISON BETWEEN NATIONAL AND PER CAPITA INCOMES IN UNITED STATES DOLLARS OF
SELECTED COUNTRIES, UNADJUSTED AND ADJUSTED BY PARE AND WORLD BANK METHODS

	Unadjusted		Adjusted			
	National income	Per capita income	P A R E		World Bank	
			National income	Per capita income	National income	Per capita income
<u>Argentina</u>						
1975	33.5	1 286.0	33.5	1 286.0	..	..
1976	50.6	1 909.8	35.4	1 338.3	..	..
1977	47.8	1 777.4	39.8	1 482.4	48.1	1 791.7
1978	61.3	2 240.9	41.3	1 513.0	56.6	2 071.4
1979	101.4	3 648.3	47.8	1 721.7	76.5	2 754.1
1980	144.5	5 116.9	52.6	1 864.0	111.3	3 942.1
1981	113.1	3 941.0	53.6	1 869.5	124.6	4 344.8
1982	50.5	1 732.1	53.9	1 850.5	104.1	3 570.9
1983	60.4	2 037.0	58.5	1 973.8	79.5	2 681.7
1984	69.6	2 311.2	62.0	2 059.8	63.8	2 121.6
Average	73.2	2 600.0	47.8	1 695.9	83.1	2 909.8
<u>USSR</u>						
1975	554.4	2 178.6	554.4	2 178.6	..	..
1976	561.9	2 188.5	624.3	2 431.6	..	..
1977	602.4	2 325.5	691.6	2 669.9	638.8	2 466.1
1978	684.9	2 621.6	776.5	2 972.3	686.7	2 628.5
1979	737.1	2 798.1	864.1	3 280.3	750.6	2 849.4
1980	780.0	2 937.6	979.8	3 690.4	826.7	3 113.5
1981	747.7	2 792.8	1 145.0	4 276.8	878.6	3 281.7
1982	795.2	2 944.6	1 270.2	4 703.8	878.6	3 253.4
1983	813.9	2 986.8	1 379.4	5 062.3	859.4	3 153.8
1984	764.6	2 780.5	1 448.1	5 266.0	841.8	3 061.3
Average	704.2	2 655.4	973.3	3 653.2	795.1	2 976.0

Table 4 (continued)

	Unadjusted		Adjusted			
	National income	Per capita income	P A R E		World Bank	
			National income	Per capita income	National income	Per capita income
India						
1975	82.2	131.4	82.2	131.4	..	..
1976	82.7	129.5	88.2	138.2	..	..
1977	94.2	144.5	101.0	155.0	96.6	148.2
1978	110.0	165.4	115.7	174.1	108.8	163.6
1979	121.6	179.4	119.3	176.0	115.3	170.2
1980	146.7	212.2	138.7	200.7	139.9	202.4
1981	154.0	218.6	159.0	225.8	161.4	229.1
1982	156.7	218.3	173.5	241.7	169.3	235.9
1983	172.6	235.8	195.6	267.3	179.5	245.3
1984	172.8	231.4	210.7	282.1	182.9	245.0
Average	129.3	186.6	138.4	199.2	144.2	205
France						
1975	303.0	5 739.7	303.0	5 739.7	..	..
1976	311.0	5 879.3	338.4	6 397.4	..	..
1977	342.1	6 445.0	369.0	6 952.5	350.0	6 595.6
1978	423.5	7 948.1	411.5	7 724.1	394.4	7 402.2
1979	513.0	9 592.0	460.9	8 618.1	471.5	8 816.3
1980	584.1	10 875.0	507.0	9 440.1	556.7	10 365.2
1981	507.5	9 402.5	555.2	10 287.1	558.3	10 901.0
1982	479.6	8 845.8	599.5	11 057.2	572.7	10 563.3
1983	456.3	8 349.9	632.8	11 580.9	513.6	9 399.9
1984	432.6	7 872.4	664.5	12 092.7	481.1	8 755.1
Average	435.2	8 094.9	484.2	8 989.0	487.3	9 099.8