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Measures of the Real GDP of U.S. Trading Partners: Methodology and Results

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INTRODUCTION

This paper provides the details of the construction of a new series of measures of the real GDP of U.S. trading partners. We construct both broad aggregates and various sub-aggregates, and analyze their respective patterns.

The need for such measures arises in the analysis of exports, which are traditionally explained through the functional form

$$X = f\,(p_X \cdot e/p_{Y^*}\,,\ Y^*)$$

where p_X = the price of exports, e = the nominal effective exchange rate (foreign currency/local), p_{Y^*} = the price of foreign goods, and Y^* = the real income of the country's trading partners.

For the U.S., various measures of export prices are readily available. In addition, the Federal Reserve publishes both nominal and real effective exchange rates for the U.S. dollar vis-à-vis its trading partners. The most general of these is the Federal Reserve trade-weighted "Broad Index of the Foreign Exchange Value of the Dollar,"[1] which is built around the 36 trading partners[2] of the U.S. that account for close to 90% of its foreign trade.[3] The Federal Reserve also breaks this index down into two sub-indexes based on "major currency trading partners" and "other important trading partners."

But when it comes to trading partner prices and real incomes, there are no good measures generally available, particularly at the quarterly level. Some authors, such as Mann (2002, pp. 137-38) rely on annual measures of the aggregate real GDP of the "rest-of-the-world"[4] (i.e. all countries in the world except the U.S.). Others, such as Marquez and Ericsson (1993) construct annual measures of the aggregate real GDP of a small number of certain important and/or "representative" U.S. trade partners. Finally, most recently, Chinn (2003, pp. 6, 33) has managed to avail himself of quarterly estimates of an export-weighted measure of the aggregate real GDP of "major" trading partners, albeit from unpublished sources.[5] For each such measure, several corresponding price indexes can be constructed, either directly, or implicitly, through the ratio of various measures of nominal to real GDP.

For The Levy Economics Institute macroeconomic model, it is necessary to have quarterly data on all of these variables. Until recently, we had been using a quarterly measure of export-share-weighted U.S. trading partner real GDP that was developed in the late 1970s and successively extended since then.[6] But the quality and coverage of available data has greatly improved since the initial construction of this measure, and many underlying variables have been substantially revised even for earlier years. For this reason, we decided to construct a wholly new dataset for U.S. trading partners, utilizing the most recently available data.

Since the Federal Reserve already provides nominal and real effective exchange rate indexes covering 36 U.S. trading partners that account for 90% of U.S. exports, as well as export shares for all of them, we chose the very same countries for the core of our own dataset. We did, however, supplement this with data on Denmark, so as to facilitate future analysis of the European Community as a whole.[7]

The coverage of our core dataset has three important advantages. It allows us to construct various income aggregates and sub-aggregates that enable us, for example, to match the Federal Reserve's "broad," "major-currency" and "other important" trading partner effective exchange rates and, more broadly, to discuss the geographical and geopolitical determinants of U.S. trade. One of our particular concerns has been that, even if they were available at a quarterly level, aggregates such as the real GDP of the rest-of-the-world might be too broad. On the other hand, measures encompassing only "major" trading partners might be too narrow, since they tend to leave out new rapidly growing trading partners. This issue is particularly significant in the case of trade-weighted measures, because after a certain point the addition of further countries having low weights contributes little to the overall pattern. Equally important is the possibility that trading partners whose importance is growing may have very different characteristics from others. There appears to be insufficient attention paid to these issues in the literature.

An additional virtue of our data set is that it allows us to construct variants of the two different types of measures that are utilized in the literature, namely direct and export-share-weighted sums of trading partner real GDPs. Finally, since the ratio of nominal to real exchange rates amounts to an "effective" index of the price of foreign GDP relative to U.S. GDP, it allows us to make use of the Federal Reserve exchange rate indexes to easily construct price series consistent with our various real income measures.

In sum, our dataset is complete enough to subsume all data currently in use in the literature as special cases. This allows us to choose the level of aggregation that is most effective in producing robust medium term projections of the impact of foreign income growth on U.S. exports.

In what follows, we describe the sources and methods of our new quarterly database, and analyze the resulting data. An overview of our results and their implications for the analysis of the U.S. balance of

trade is presented in the Levy Institute Policy Note entitled "Is International Growth the Way Out the U.S. Current Deficits? A Note of Caution."

SOURCES AND METHODS FOR MEASURES OF U.S. TRADING PARTNER GDP

Country Coverage
As previously noted, the country coverage of our core data set is that of the Federal Reserve trade-weighted "Broad Index of the Foreign Exchange Value of the Dollar": the 36 important trading partners of the U.S. that account for close to 90% of its foreign trade. The Federal Reserve also groups them into two subsets that might be called "major-currency trading partners" and "other important trading partners," for which it also provides exchange rate indexes. It is of course possible to group these countries in other ways, and to expand the coverage (as we have already done through the inclusion of Denmark), in order to facilitate regional analysis. But here we concentrate on the description of the core set.

Major-Currency Trading Partners
Australia, Austria, Belgium/Luxembourg, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, Portugal, Netherlands, Spain, Switzerland, Sweden, and the United Kingdom.

Other Important Trading Partners
Argentina, Brazil, Chile, China, Colombia, Hong Kong, India, Indonesia, Israel, Malaysia, Mexico, Philippines, Russia, Saudi Arabia, Singapore, South Korea, Taiwan, Thailand, and Venezuela.

Data Sources and Methods
Given that the Federal Reserve's "U.S. exports weights" used in our weighted indexes are only available after 1970,[8] and given that many countries started producing quarterly real GDP series around the same date, we chose to start our "main" series in 1970Q1. An earlier start date, say 1960, would have been desirable in addressing the impact of events such as the first oil shock in 1973. But this is more difficult because true quarterly data, and in some cases even annual data, is missing for many important countries.[9] The basic issues are discussed next, with further details provided in the appendix.

Our primary data source was the "International Financial Statistics" (IFS) CD-ROM database from the International Monetary Fund (IMF), which contains quarterly data on a wide range of countries. But the IFS databank is far from complete and had to be modified and/or complemented in several ways. In particular, we dealt with occasional omissions and/or errors in the IFS[10] by using additional data from the IMF's "World Economic Outlook"[11] (WEO), the World Bank's "World Development Indicators" and official national sources[12]. Otherwise, the basic problem was that true quarterly data was available at different dates for various countries, and in some cases not available at all. Table 1 lists the start dates for available quarterly data on the various countries. In almost all cases where the available data did not encompass the whole period from 1970Q1 to the present, we filled in missing data by interpolating available annual series. This is described in detail in the Appendix.

Table 1: Start dates of available quarterly real GDP data, by country			
Federal Reserve "Major-Currency" Countries			
Australia	1959:3	Italy	1960:1
Austria	1964:1	Japan	1957:1
Belgium/Luxembourg[13]	1980:1	Portugal	1988:1[14]
Canada	1957:1	Netherlands	1977:1
Finland	1970:1	Spain	1970:1
France	1970:1	Switzerland	1965:1
Germany	1960:1	Sweden	1969:1
Greece	None[15]	United Kingdom	1957:1
Ireland	1997:1		
Federal Reserve "Other Important Trading Partners"			
Argentina	1968:1[16]	Mexico	1980:1
Brazil	1991:1	Philippines	1981:1
Chile	1980:1	Russia	None
China	None	Saudi Arabia	None
Colombia	None	Singapore	1984:3
Hong Kong	1986:1	South Korea	1960:1
India	None[17]	Taiwan	None
Indonesia	None	Thailand	1993:1
Israel	1980:1[18]	Venezuela	None
Malaysia	1988:1		
Additional Country (for coverage of the European Community)			
Denmark 1988:1			

Another difficulty with the IFS database is that it is "country specific" and, as a consequence, somewhat idiosyncratic in its presentation of the data. We had therefore to adjust all IFS quarterly GDP series at constant price to be: (i) measured in billions of national currency (since some of them were in millions); (ii) seasonally adjusted (since some of them were not); and (iii) annualized (i.e., multiply some quarterly data by four where they were not in annual equivalents) (iv) expressed in 1995 constant prices because this was the most common base year[19] (v) expressed in 1995 U.S. dollars using IFS exchange rate data for that year.[20]

An additional detail is that the different countries have different release dates for most recent data. So while the United Kingdom had already released its "final" real GDP numbers for the last quarter of 2002 as of April 2003, many countries had not yet released their 2002 third and second quarter figures, while still others who only release annual data had not yet even released 2002 figures. In cases in which available data did not cover the last quarter of 2002, we chose to "complete" the series using interpolations of the annual forecasts available in the IMF's World Economic Outlook database (April, 2003).

CONSTRUCTION OF MEASURES OF TRADING PARTNER REAL GDP

Having completed the database, we then constructed a variety of aggregate measures of the income of U.S. trading partners. The first of these is simply the direct sum of the real GDPs of the chosen set of countries. Here, we not only calculate the total direct sum for the full 36 countries upon which the Federal Reserve "broad" exchange rate index is based, but also for the country subsets upon which the Federal Reserve "major currency" and "other important trading partner" indexes are based. Alternately, we divide the core set into geographical areas such as

The Americas: Argentina, Brazil, Canada, Chile, Colombia, Mexico, and Venezuela
Europe: Austria, Belgium/Luxembourg, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Netherlands, Russia, Spain, Switzerland, Sweden and the United Kingdom (all from the core set), plus Denmark.
Middle East: Israel and Saudi Arabia
Asia and Oceania: Australia, Mainland China, Hong Kong, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand

In the case of export-weighted measures, we created various fixed-weight indexes, using export shares in 1971, 1981, 1991, and 2001, respectively. We also created variable-weight measures using annual export shares. And finally, we created a measure using periodically-adjusted-fixed-weights, by splicing the various fixed weight series together in each relevant year (e.g., splicing the 1981 series to the 1971 one in the year 1981, etc.). In all such cases, we used geometric averages.[21]

Finally, in the case of weighted measures, the issue of scale requires attention. A direct sum has a natural scale, in the sense that it is the direct sum of individual real GDPs all expressed in 1995 prices and 1995 U.S. dollars. But attaching export share weights to each of these same individual real GDPs, and then summing them, will give a very different level to the series, because now each individual GDP component is multiplied by a number less than one. One way to approach the matter is to recognize that a direct sum of 36 trading partner GDPs may be thought of as an equal-weighted average, with each weight equal to 1, so that the sum of weights is 36. Conversely, weighing each country's GDP by its share in U.S. exports gives us a weighted average with weights that sum to 1. One way to make the two consistent is to scale the latter by multiplying it by 36. None of this has any effect, of course, on trends or growth rates.

EMPIRICAL PATTERNS IN MEASURES OF TRADING PARTNER REAL GDP

Since the implications of our measures are discussed in the Levy Institute Policy Note entitled "Is International Growth the Way Out of U.S. Current Deficits? A Note of Caution" here we focus only on the broad patterns in our data.

Because direct sum measures have a direct meaning in terms of scale, we begin with them. Figure 1

contrasts the patterns in the real GDP of the U.S. with that of its important trading partners. It is evident that, as a whole, these trading partners constitute a "region" whose real GDP is roughly two-and-a-half times as large as the U.S.

Figure 2 displays the ratios of the trading partner real GDPs to that of the U.S. We see that major currency trading partner GDP rises relative to that of the U.S. from 1970-82, stagnates from 1982-91, and falls after 1992. Because of the size of this set of countries, this same pattern carries over to the total set of countries. Thus on the whole the U.S. has grown more rapidly than its trading partners for over a decade. This has been widely cited as an important factor in the steady deterioration of the U.S. trade balance since 1992 (Economic Report of the President 2003, p. 62; Mann 2002, pp. 137-38).

But as it turns out, this perception is mistaken. When we distinguish between major-currency and other-important trading partners, we find that the U.S. grows more rapidly than the former and less rapidly than the latter. Other things being equal, this should imply that the U.S. trade balance with the former should deteriorate, while that with the latter should improve. But in point of fact, both deteriorate in almost identical manner. A similar result obtains when we examine the three countries (Japan, China, and Germany) that account for the bulk of the U.S. trade deficit since 1991. Once again, we find that even though the U.S. has grown more rapidly than Japan and Germany and considerably less rapidly than China, the U.S. trade deficit has significantly worsened with all three, and most of all with China. We discuss this in somewhat more detail in our previously mentioned Policy Note.

The preceding results caution us to examine the underlying patterns more carefully, to try to seek a robust level of aggregation, and to keep in mind the influence of factors such as exchange rate movements and differences in international competitiveness. A principal advantage of our new database is that it enables us to delve into such matters in further detail.

Turning now to our general set of measures, which encompasses direct sum and export-share-weighted measures, we analyze the following five measures of the total trading partner real GDP in relation to U.S. real exports.

WDEM1 = Direct sum

WDEM2 = Weighted average using annual export-shares (moving weights)

WDEM3 = Weighted average using 1971 export-shares (fixed weight)

WDEM4 = Weighted average using 2001 export-shares (fixed weight)

WDEM5 = Weighted average using decennially adjusted weights beginning with 1971, spliced to the preceding level of the series at each switch point (spliced weights).

Figure 3 displays the natural logarithms of the various measures. We can see there that the spliced and fixed weight measures (WDEM1, WDEM3, WDEM4) behave in very similar ways. Because the spliced measure involves adjustments in the level of the series at each weight-change point (e.g. at 1981 the level of the series with 1981-weights is made equal to its level in 1981 at 1971-weights), the meager differences between the 1971 fixed-weight and the spliced periodically-changing weight measures (WDEM1 and WDEM3, respectively) tells us that the impact of such changes in weight is relatively

small. But that is not the case with the measure involving continuously changing weights, which displays a much slower overall rate of growth and considerably higher volatility. Finally, we find that the direct sum measure (WDEM1) generally grows more slowly than the fixed-weight and spliced-weight measures.

Figures 4-6 and Table 2 examine the correlations between the growth rate of these various measures and that of U.S. real exports. These were all calculated at annualized rates, as the difference between logarithms of values 4 quarters apart. At a visual level, all seem to perform fairly well, although the fixed weight measures appear to be the best in this regard (Figure 5) and the moving weights the worst (Figure 6). But Table 2 tells a somewhat different picture, in that the spliced weight measure appears best, with the fixed weight and direct sum measures close behind, and the moving weight one far behind.

Table 2: Correlations between growth rates of trading partner real GDP and U.S. real exports				
WDEM1 (Direct Sum)	WDEM2 (Moving weights)	WDEM3 (1971 weights)	WDEM4 (2001 weights)	WDEM5 (Spliced weights)
0.632	0.348	0.641	0.646	0.679

While it is encouraging to find relatively high correlations between trading partner real GDPs and U.S. real exports, it should be said that such a correlation is by no means the end goal. We noted at the beginning of this paper that exports are traditionally explained through an equation, usually in growth rates, of the form

$$X = f(p_X \cdot e/p_{Y*} , Y*)$$

where p_X = the price of exports, e = the nominal effective exchange rate (foreign currency/local), p_{Y*} = the price of foreign goods, and $Y*$ = the real income of the country's trading partners. In this regard, the true test of a measure of $Y*$ is its performance in such an equation, since that would assess the ability of income to explain exports in light of the movements of relative prices. To select the income measure that gives the best direct correlation with exports would be inadequate and possibly quite misleading.

With this in mind, we compared the performance of the various income measures in a *general representation of the growth form of the export equation*. We estimated a general error-correction equation of the form[22]

$$\Delta X_t = \alpha + \sum_{i=1}^{k} \rho_i \cdot \Delta X_{t-i} + \sum_{i=1}^{k} \beta_i \cdot \Delta W_{t-i} + \sum_{i=1}^{k} \gamma_i \cdot \Delta P_{t-i} - \rho\,(X_{t-1} - \beta \cdot W_{t-1} - \gamma \cdot P_{t-1}) + \varepsilon_t$$

where X represents U.S. exports at 1996 chained prices; W represents one of our measures of trading partner GDP; and P is the 36 country real effective exchange rate index ("price-adjusted broad dollar index") published by the Federal Reserve. All variables are expressed in natural logs.

Table 3 reports the long-run elasticities obtained by estimating our test equation from 1975q2 to 2000q4,

and using the estimates for generating forecasts for the period from 2001q1 to 2002q3, with up to eight lags (i.e. setting the index k in the equation to 8).

Table 3: Performance of Trading Partner GDPs in an Export Equation					
Trading Partner GDP Measure	ρ	β	γ	R^2	RMSE
WDEM1: Direct Sum	0.053	2.577	-0.857	0.114	0.032
WDEM2: 1971 weights	0.098	2.419	-0.969	0.262	0.027
WDEM3: 2001 weights	0.100	2.081	-0.778	0.238	0.026
WDEM4: moving weights	0.004	7.092	-16.64	0.120	0.031
WDEM5: spliced weights	0.125	2.202	-0.678	0.226	0.028

Columns labelled β, γ in the table report the estimated values for income and price long-run elasticities in equation Y, while ρ represent the estimates for the speed of adjustment. All estimates are significant, with the exception of representation (4) which uses the current share of each country exports on total U.S. exports as weights in constructing our measure of "world" GDP.

R^2 is adjusted for the degrees of freedom, while RMSE is the Root Mean Square Error from dynamic forecasts of the endogenous variable over the period 2000q1 to 2002q2.

It is apparent that the equation has a low explanatory power, and our results are mixed. If one chooses a "best fit" indicator such as the R^2 statistic, the fixed weight measures (WDEM2, WDEM3) are somewhat better than the spliced one (WDEM5), with the moving weights and direct sum (WDEM4, WDEM1) far behind. On the other hand, if more attention is given to the overall forecasting ability of the equation, the spliced weight measure (WDEM5) performs in line with the fixed ones, with the other two once again far behind.

On the whole, the fixed weight and periodically-adjusted fixed weight measures emerge as the most robust. But this is an issue we intend to explore further, in a forthcoming working paper on the balance of trade deficit. The construction of this general database for trading partner incomes was a vital step in that direction.

REFERENCES

Board of Governors of the Federal Reserve Bank. "Currency Weights Broad Index of the Foreign Exchange Value of the Dollar." (various dates). Available at http://www.federalreserve.gov/releases/ h10/weights/

Chinn, M. 2003. "Doomed to Deficits?: Aggregate U.S. Trade Flows Re-Examined." *National Bureau of Economic Research, Working Paper 9521*. February.

Cripps, F. 1980. "World Trade and Finance." *Cambridge Economic Policy Review*. December.

Cronovitch, R., R. Gazel. 1998. "Do Exchange Rates and Foreign Incomes Matter for Exports at the State Level?" *Journal of Regional Economic Science* 38(4).

Dos Santos, C., A. Shaikh, and G. Zezza. Forthcoming. "Is International Growth the Way Out of U.S. Current Deficits? A Note of Caution." *Policy Note.* Annandale-on-Hudson, N.Y.: The Levy Economics Institute of Bard College.

Economic Report of the President. 2003. Washington, D.C.: USGPO.

Fisher, F. 1993. "Aggregation: Aggregate Production Functions and Related Topics." Cambridge, Mass.: MIT Press.

Godley, W. 2001. "Interim Report: Notes on the U.S. Trade and Balance of Payments Deficits." Annandale-on-Hudson, N.Y.: The Levy Economics Institute of Bard College.

International Monetary Fund. 2003. "International Financial Statistics CD-ROM." April.

International Monetary Fund. 2003. "World Economic Outlook Databank." April. Available at http://www.imf.org/external/pubs/ft/weo/2003/01/data/index.htm#3

Leahy, M. 1998. "New Summary Measures of Foreign Exchange Value of the Dollar." *Federal Reserve Bulletin.* October. Available at: http://www.federalreserve.gov/pubs/bulletin/1998/1098lead.pdf

Mann, C. 2002. "Perspectives on the U.S. Current Account Deficit and Sustainability." *Journal of Economic Perspectives* 16(3): Summer.

Marquez, Jaime and Neil Ericsson. 1993. "Evaluating Forecasts of the U.S Trade Balance." In Bryant, R., Hooper, P., and Mann, C., eds. *Evaluating Policy Regimes: New Research in Empirical Macroeconomics.* Washington, D.C.: The Brookings Institution.

Quantitative Micro Software. 2002. "E-Views 4.0 Help."

Rosensweig, J. 1987. "Constructing and Using Exchange Rate Indexes." *Federal Reserve Bank of Atlanta Economic Review.* Summer.

United Nations et. al. 1993."System of National Accounts 1993."

U.S. Trade Deficit Review Commission. 2000. "The U.S. Trade Deficit: Causes, Consequences and Recommendations for Action." Washington, D.C.

Whelan, K. 2000. "A Guide to the Use of Chain Aggregated NIPA Data." Mimeo. Board of Governors of the Federal Reserve. June.

World Bank. 2002. "World Development Indicators CD-ROM."

APPENDIX: Sources, Methods, and Coverage

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Index Number	IFS	None	21399BVPZF...	GDP VOL. (1995=100)
B	Nat.Currency	IFS	Millions	21399B.PXF...	GDP AT 1993 PRICES
C	Index Number	IFS	None	21399BIPZF...	GDP DEFL (1995=100)
D	Nat.Currency	IFS	Millions	21399B.PXF...	GDP AT 1993 PRICES
E	Index Number	IFS	None	21399BVPZF...	GDP VOL. (1995=100)
F	Nat.Currency	IFS	None	213..RF.ZF...	Nat.Currency per U.S. Dollar
G	Nat.Currency	WEO	Billions	W213NGDP_R	GDP AT 1993 PRICES

1.2 - Adjustments Made:

IFS annual GDP at 1993 prices series was converted to billions of national currency, extended backwards using the annual volume index and then interpolated quarterly. Quarterly GDP at 1993 prices series was converted to billions of national currency and extended backwards using IFS interpolated data (from 1992Q4 to 1980Q4) and the quarterly index series (from 1980Q3 to 1970Q1). The series was then seasonally adjusted where necessary, re-based into 1995 prices (using the relevant GDP deflator) and extended until 2002Q4 using IMF's World Economic Outlook 2002 forecast (also re-based into 1995 prices). The resulting series was then converted to 1995 dollars using the relevant IFS exchange rate.

2 - AUSTRALIA:

2.1 - Raw Series Used:

A - IFS Quarterly GDP at 1996-1997 prices from1970Q1 until 2002Q2.

B - IFS Quarterly GDP deflator

C - IFS exchange rate (U.S. Dollars per National currency on average).

D - WEO Annual GDP at 1996-1997 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	19399B.RZF...	GDP AT 96-97 PRICES
B	Index Number	IFS	None	19399BIRZF...	GDP DEFL. (1995=100)
C	U.S. dollars	IFS	None	193..RH.ZF...	U.S. Dollars per Nat.Currency
D	Nat.Currency	WEO	Billions	W193NGDP_R	GDP AT 96-97 PRICES

2.2 - Adjustments Made:

IFS quarterly GDP at 1996-1997 prices was extended until 2002Q4 using the IMF's World Economic

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Index Number	IFS	None	12499BVPZF...	GDP VOL. (1995=100)
B	Euros	IFS	Billions	12499B.PZW...	GDP AT 1995 PRICES
C	Euros	IFS	Billions	12499B.PZW...	GDP AT 1995 PRICES
D	Index Number	IFS	None	12499BVPZF...	GDP VOL. (1995=100)
E	Euros	WEO	Billions	W124NGDP_R	GDP AT 1995 PRICES

4.1.2 - Luxembourg

A - WDI Annual GDP at 1995 prices in 1995 dollars from 1970 until 2000.

B - WEO Annual Real Rate of Growth of GDP from 2001 to 2002.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	95 U.S. Dollars	WDI	Units	NY.GDP.MKTP.KD	GDP AT 1995 PRICES
B	Percent Change	WEO	None	W137NGDP_R%	Real GDP Growth

4.2 - Adjustments Made:

4.2.1 - Belgium

IFS annual GDP at 1995 prices series was extended backwards using the annual volume index and then interpolated quarterly. IFS quarterly GDP at 1995 prices series was annualized and extended backwards using the index series (until 1980Q1) and interpolated quarterly (from 1979Q4 to 1970Q1. The series was then seasonally adjusted, extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate (i.e., 1 ECU = U.S.$1.31).

4.2.2 - Luxembourg

WDI annual GDP at 1995 prices in 1995 dollars series was extended until 2002 using the WEO series and then interpolated. The resulting series was then added to that for Belgium.

5 - BRAZIL:

5.1 - Raw Series Used:

A - IPEA Quarterly volume index (1990=100) from1991Q1 until 2002Q4.[26]

B - IFS Annual GDP at 1990 prices from 1970 until 2001.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - IFS Annual GDP deflator.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Index Number	PEA	None	None	GDP VOL. (1990=100)
B	Nat currency	IFS	N/A[27]	22399B.PWF...	GDP AT 1990 PRICES
C	Nat currency	IFS	None	223..RF.ZF...	National Currency per U.S. Dollar
D	Index Number	IFS	None	22399BIPZF...	GDP DEFL. (1995=100)

5.2 - Adjustments Made:

GDP at 1990 prices series was obtained from the volume index and the annual GDP at 1990 prices series. It was then extended backward using interpolated quarterly data (from 1990Q4 to 1970Q1), re-based into 1995 prices (using the relevant GDP deflator), and converted to 1995 dollars using the relevant IFS exchange rate.

6 - CANADA:

6.1 - Raw Series Used:

A - IFS Quarterly GDP at 1997 prices from 1999Q1 until 2002Q4.

B - IFS Quarterly volume index (1995=100) from 1970Q1 until 2002Q4.

C - IFS Quarterly GDP deflator.

D - IFS exchange rate (National Currency per U.S. Dollar on average).

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	15699B.RXF...	GDP AT 1997 PRICES
B	Index Number	IFS	None	15699BVRZF...	GDP VOL. (1995=100)
C	Index Number	IFS	None	15699BIRZF...	GDP DEFL. (1995=100)
D	Nat.Currency	IFS	None	156..RF.ZF...	National Currency per U.S. Dollar

6.2 - Adjustments Made:

IFS Quarterly GDP at 1997 prices series was extended backwards using the index series. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator), and converted to 1995 dollars using the relevant IFS exchange rate.

7 - CHILE:

7.1 - Raw Series Used:

A - Chilean quarterly GDP at 1996 prices from1996Q1 until 2002Q3.[28]

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	WEO	Billions	W924NGDP_R	GDP AT 1990 PRICES
B	Nat. Currency	WEO	Billions	W924NGDP	GDP at current prices
C	Nat.Currency	IFS	None	924..WF.ZF...	National Currency per U.S. Dollar

8.2 - Adjustments Made:

IMF's World Economic Outlook annual GDP at 1990 prices series (including the 2002 forecast) was interpolated quarterly, re-based into 1995 prices (using the GDP deflator obtained through the comparison of series A and B in 1995) and converted to 1995 dollars using the relevant IFS exchange rate.

9 - CHINA (HONG KONG):

9.1 - Raw Series Used:

A - IFS quarterly GDP at 2000 prices from 1999Q3 until 2002Q3.

B - IFS quarterly volume index (1995=100) from1986Q1 until 2002Q3.

C - IFS Annual GDP at 2000 prices from 1990 until 2001.

D - IFS Annual volume index (1995=100) 1970 until 2001.

E - IFS exchange rate (National Currency per U.S. Dollar on average).

F - IFS Quarterly GDP deflator.

G - WEO Annual GDP at 2000 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IIFS	Billions	53299B.PWF...	GDP AT 2000 PRICES
B	Index Number	IIFS	None	53299BVPZF...	GDP VOL. (1995=100)
C	Nat.Currency	IIFS	Billions	53299B.PWF...	GDP AT 2000 PRICES
D	Index Number	IIFS	None	53299BVPZF...	GDP VOL. (1995=100)
E	Nat.Currency	IIFS	None	532..RF.ZF...	National Currency per U.S. Dollar
F	Index Number	IIFS	None	53299BIPZF...	GDP DEFL. (1995=100)
G	Nat.Currency	WEO	Billions	W532NGDP_R	GDP AT 2000 PRICES

9.2 - Adjustments Made:

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Euros	IFS	Billions	13499B.RYW...	GDP AT 1995 PRICES
B	Index Number	IFS	None	13499BVRZF...	GDP VOL. (1995=100)
C	Euros	WEO	Billions	W134NGDP_R	GDP AT 1995 PRICES

13.2 - Adjustments Made:

GDP at 1995 prices series was annualized and extended backwards using the index series. The resulting series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate (i.e., 1 ECU = U.S.$1.31).

14 - GREECE

14.1 - Raw Series Used:

A - IFS Annual GDP at 1995 prices in Drachmas from 1995 until 2001.[29]

B - IFS Annual GDP at 1995 prices in Euros from 2001 until 2002.

C - IFS Annual volume index (1995=100) from 1970 until 2001.

D - IFS exchange rate (Drachmas per U.S. Dollars on average).

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Drachmas	IFS	Billions	17499B.PYF...	GDP AT 1995 PRICES
B	Euros	IFS	Billions	17499B.PZW...	GDP AT 1995 PRICES
C	Index Number	IFS	None	17499BVPZF...	GDP VOL. (1995=100)
D	Drachmas	IFS	None	174..RF.ZF...	Drachmas per U.S. Dollar

14.2 - Adjustments Made:

Annual GDP at 1995 prices (from 1995 until 2001) in Drachmas was extended backwards using an index series and forwards using the growth rate of the series in Euros, interpolated quarterly, and converted to 1995 dollars using the relevant IFS exchange rate.

15 - INDIA:

15.1 - Raw Series Used:

A - IFS Annual GDP at 1993-1994 prices from 1988 until 2000.[30]

B - IFS Annual volume index (1995=100) 1970 until 2000.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - IFS GDP deflator.

E - WEO Annual GDP at 1993-1994 factor prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	53499B.PYF...	GDP AT 93-94 PRICES
B	Index Number	IFS	None	53499BVPZF...	GDP VOL. (1995=100)
C	U.S. dollars	IFS	None	534..RF.ZF...	National Currency per U.S. Dollar
D	Index Number	IFS	None	53499BIPZF...	GDP DEFL. (1995=100)
E	Nat.Currency	WEO	Billions	W534NGDP_R	GDP AT 93-94 PRICES

15.2 - Adjustments Made:

Annual GDP at 1993-94 prices was extended backwards using the index series and forward using the WEO data. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator), interpolated quarterly, and converted to 1995 dollars using the relevant IFS exchange rate.

16 - INDONESIA:

16.1 - Raw Series Used:

A - IFS Annual GDP at 1993 prices from 1993 until 2001.

B - IFS Annual volume index (1995=100) 1970 until 2001.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - IFS GDP deflator.

E - WEO Annual GDP at 1993 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	53699B.PWF...	GDP AT 1993 PRICES
B	Index Number	IFS	None	53699BVPZF...	GDP VOL. (1995=100)
C	Nat.Currency	IFS	None	536..RF.ZF...	National Currency per U.S. Dollar
D	Index Number	IFS	None	53699BIPZF...	GDP DEFL. (1995=100)
E	Nat.Currency	WEO	Billions	W536NGDP_R	GDP AT 1993 PRICES

16.2 - Adjustments Made

Annual GDP at 1993 prices (from 1993 until 2001) was extended backwards using an index series and interpolated quarterly. The resulting series was then re-based into 1995 prices data (using the relevant GDP deflator), extended until 2002Q4 using interpolated quarterly data from the IMF's World Economic Outlook 2002 forecast (also re-based into 1995 prices), and converted to 1995 dollars using the relevant IFS exchange rate.

17 - IRELAND:

17.1 - Raw Series Used:

A - IFS quarterly GDP at 1995 prices from 1997Q1 until 2002Q3.

B - IFS Annual GDP at 1995 prices from 1990 until 2001.

C - IFS Annual volume index (1995=100) 1970 until 2001.

D - IFS exchange rate (U.S. Dollars per National currency on average).

E - IFS GDP deflator.

F - WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Irish Pounds	IFS	Millions	17899B.PWF...	GDP AT 1995 PRICES
B	Irish Pounds	IFS	Millions	17899B.PWF...	GDP AT 1995 PRICES
C	Index Number	IFS	None	17899BVPZF...	GDP VOL. (1995=100)
D	U.S. dollars	IFS	None	178..RH.ZF...	U.S. Dollars per Irish Pound
E	Index Number	IFS	None	17899BIPZF...	GDP DEFL. (1995=100)
F	Euros	WEO	Billions	W178NGDP_R	GDP AT 1995 PRICES

17.2 - Adjustments Made:

Annual GDP at 1995 prices (from 1993 until 2001) was extended backwards using an index series and interpolated quarterly. Quarterly GDP at 1995 prices series was converted to billions of national currency, annualized and extended backwards using interpolated quarterly data. The series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast (converted to Irish Pounds), and converted to 1995 dollars using the relevant IFS exchange rate.

18 - ISRAEL:

18.1 - Raw Series Used:

A - IFS quarterly GDP at 1995 prices from 1995Q1 until 2001Q3.

B - IFS quarterly volume index (1995=100) from 1980Q1 until 2001Q3.[31]

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - IFS Quarterly GDP deflator.

E - WEO Annual GDP at 2000 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Millions	43699B.PTF...	GDP AT 1995 PRICES
B	Index Number	IFS	None	43699BVPZF	GDP VOL. (1995=100)
C	Nat.Currency	IFS	None	436..RF.ZF...	National Currency per U.S. Dollar
D	Index Number	IFS	None	43699BIPZF...	GDP DEFL. (1995=100)
E	Nat.Currency	WEO	Billions	W436NGDP_R	GDP AT 2000 PRICES

18.2 - Adjustments Made:

Annual WEO GDP at 2000 prices was re-based into 1995 prices data (using the relevant GDP deflator) and interpolated quarterly. IFS quarterly GDP at 1995 prices series was converted to billions of national currency, annualized and extended backwards using the index series (until 1980Q1) and interpolated quarterly data from the re-based World Economic Outlook annual series (from 1979Q4 to 1970Q1). The series was extended until 2002Q4 using interpolated quarterly data obtained from the re-based IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

19 - ITALY (Euros):

19.1 - Raw Series Used:

A - IFS Quarterly GDP at 1995 prices from1999Q1 until 2002Q3.

B - IFS Quarterly volume index (1995=100) from 1970Q1 until 2002Q3.

C - WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Euros	IFS	Billions	13699B.RYW.	GDP AT 95 PRICES
B	Index Number	IFS	None	13699BVRZF	GDP VOL. (95=100)
C	Euros	WEO	Billions	W136NGDP_R	GDP AT 95 PRICES

19.2 - Adjustments Made:

GDP at 1995 prices series was annualized, extended backwards using the index series and extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate (i.e., 1 ECU = U.S.$1.31).

20 - JAPAN

20.1 - Raw Series Used:

A - IFS quarterly GDP at 1995 prices from 1980Q1 until 2002Q3.

B - IFS quarterly volume index (1995=100) from 1970Q1 until 2002Q3.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D -WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	15899B.RXF...	GDP AT 1995 PRICES
B	Index Number	IFS	None	15899BVRZF...	GDP VOL. (1995=100)
C	Nat.Currency	IFS	None	158..RF.ZF...	National Currency per U.S. Dollar
D	Nat.Currency	WEO	Billions	W158NGDP_R	GDP AT 1995 PRICES

20.2 - Adjustments Made:

GDP at 1995 prices series was extended backwards using the index series (that was seasonally adjusted). The resulting series was then extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

21 - KOREA:

21.1 - Raw Series Used:

A - IFS quarterly GDP at 1995 prices from 1970Q1 until 2002Q3.

B - IFS exchange rate (National Currency per U.S. Dollar on average).

C -WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	54299B.PVF...	GDP AT 1995 PRICES
B	Nat.Currency	IFS	None	542..RF.ZF...	National Currency per U.S. Dollar
C	Nat.Currency	WEO	Billions	W542NGDP_R	GDP AT 1995 PRICES

21.2 - Adjustments Made:

The series was annualized, extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

22 - MALAYSIA:

22.1 - Raw Series Used:

A - IFS quarterly GDP at 1987 prices from 1991Q1 until 2002Q3.

B - IFS quarterly volume index (1995=100) from 1988Q1 until 2002Q3.

C - IFS annual GDP at 1987 prices from 1987 until 2001.

D - IFS annual volume index (1995=100) from 1970 until 2001

E - IFS exchange rate (National Currency per U.S. Dollar on average).

F - IFS GDP deflator.

G - WEO Annual GDP at 2000 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Millions	54899B.PYF...	GDP AT 1987 PRICES
B	Index Number	IFS	None	54899BVPZF...	GDP VOL. (1995=100)
C	Nat.Currency	IFS	Millions	54899B.PYF...	GDP AT 1987 PRICES
D	Index Number	IFS	None	54899BVPZF...	GDP VOL. (1995=100)
E	Nat.Currency	IFS	None	548..RF.ZF...	National Currency per U.S. Dollar
F	Index Number	IFS	None	54899BIPZF...	GDP DEFL. (1995=100)
G	Nat.Currency	WEO	Billions	W548NGDP_R	GDP AT 1987 PRICES

22.2 - Adjustments Made:

Annual GDP at 1987 prices was converted to billions of national currency, extended backwards using the index series and interpolated quarterly. Quarterly GDP at 1987 prices series was converted to billions of national currency, annualized and extended backwards using the index series (until 1988Q1) and interpolated quarterly data (from 1987Q4 to 1970Q1). The resulting series was then seasonally adjusted and re-based into 1995 prices (using the relevant GDP deflator). The series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast (also re-based) and converted to 1995 dollars using the relevant IFS exchange rate.

23 - MEXICO

23.1 - *Raw Series Used:*

A - IFS quarterly GDP at 1993 prices from 1980Q1 until 2002Q3.

B - IFS annual GDP at 1993 prices from 1980 until 2001.

C - IFS annual volume index (1995=100) from 1970 until 2001

D - IFS exchange rate (National currency per U.S. dollar on average)

E - IFS GDP deflator.

F - WEO Annual GDP at 1993 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	27399B.RWF...	GDP AT 1993PRICES
B	Nat.Currency	IFS	Billions	27399B.RWF...	GDP AT 1993 PRICES
C	Index Number	IFS	None	27399BVRZF...	GDP VOL. (1995=100)
D	Nat.Currency	IFS	None	273..WF.ZF...	National Currency per U.S. Dollar
E	Index Number	IFS	None	27399BIRZF...	GDP DEFL. (1995=100)
F	Nat.Currency	WEO	Billions	W273NGDP_R	GDP AT 1993 PRICES

23.2 - *Adjustments Made:*

Annual GDP at 1993 prices was extended backwards using the index series and interpolated quarterly. Quarterly GDP at 1993 prices series was seasonally adjusted, extended backwards using interpolated quarterly data and re-based into 1995 prices (using the relevant GDP deflator). The series was extended until 2002Q4 using (re-based) interpolated quarterly data obtained from the IMF's World Economic Outlook 2002 forecast and converted to 1995 dollars using the relevant IFS exchange rate.

24 - NETHERLANDS (in Euros)

24.1 - *Raw Series Used:*

A - IFS Quarterly (chained, 1995 ref) "real" GDP from 1999Q1 until 2002Q3.

B - IFS Quarterly volume index (1995 = 100) from 1977Q1 until 2002Q3.

C - IFS Annual (chained, 1995 ref) "real" GDP from1999 to 2001

D - IFS Annual volume index (1995 = 100) from 1970 to 2001

E - WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Euros	IFS	Billions	13899B.RZW...	GDP AT 1995 PRICES
B	Index Number	IFS	None	13899BVRZF...	GDP VOL. (1995=100)
C	Euros	IFS	Billions	13899B.RZW...	GDP AT 1995 PRICES
D	Index Number	IFS	None	13899BVRZF...	GDP VOL. (1995=100)
E	Euros	WEO	Billions	W138NGDP_R	GDP AT 1995 PRICES

24.2 - Adjustments Made:

Annual GDP series was extended backwards using the index series and interpolated quarterly. Quarterly chained real GDP (1995 ref) series was annualized and extended backwards using the index series (from 1998Q4 until 1977Q1) and interpolated quarterly data from the annual series (from 1976Q4 until 1970Q1). The resulting series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate (i.e., 1 ECU = U.S.$1.31).

25 - PHILIPPINES

25.1 - Raw Series Used:

A - IFS quarterly GDP at 1985 prices from 1981Q1 until 2002Q2.

B - IFS annual GDP at 1985 prices from 1970 until 2001.

C - IFS exchange rate (National currency per U.S. dollar on average)

D - IFS GDP deflator.

E - WEO Annual GDP at 1985 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	56699B.PZF...	GDP AT 1985 PRICES
B	Nat.Currency	IFS	Billions	56699B.PZF...	GDP AT 1985 PRICES
C	Nat.Currency	IFS	None	566..RF.ZF...	National Currency per U.S. Dollar
D	Index Number	IFS	None	56699BIPZF...	GDP DEFL. (1995=100)
E	Nat.Currency	WEO	Billions	W566NGDP_R	GDP AT 1985 PRICES

25.2 - Adjustments Made:

Annual GDP at 1985 prices series was interpolated quarterly. Quarterly GDP at 1985 prices series was seasonally adjusted, annualized and extended backwards using interpolated quarterly data. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator), extended until 2002Q4 using (re-based) interpolated quarterly data obtained from the IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	WEO	Billions	W922NGDP_R	GDP AT 1995 PRICES
B	1995 Dollars	WDI	**UNITS**	NY.GDP.MKTP.KD	GDP AT 1995 PRICES
C	Nat.Currency	IFS	None	922..RF.ZF...	National Currency per U.S. Dollar

27.2 - Adjustments Made:

World Economic Outlook annual GDP at 1995 prices series (beginning in 1991 and including the 2002 forecast) was interpolated quarterly and converted to 1995 dollars using the relevant IFS exchange rate. Annual GDP at 1995 prices in 1995 dollars available from World Development Indicators was converted to billions and interpolated. The two interpolated series were then "merged" in 1993:1.

28 - SAUDI ARABIA

28.1 - Raw Series Used:

A - IFS Annual GDP at 1999 prices from 1996 until 2001.

B - IFS Annual volume index (1995=100) 1970 until 2001.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - IFS GDP deflator.

E - WEO Annual GDP at 1999 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	45699B.PYF...	GDP AT 1999 PRICES
B	Index Number	IFS	None	45699BVPZF...	GDP VOL. (1995=100)
C	Nat.Currency	IFS	None	456..RF.ZF..	National Currency per U.S. Dollar
D	Index Number	IFS	None	45699BIPZF...	GDP DEFL. (1995=100)
E	Nat.Currency	WEO	Billions	W456NGDP_R	GDP AT 1999 PRICES

28.2 - Adjustments Made:

Annual GDP at 1999 prices (from 1996 until 2000) was extended backwards using the index series. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator) and interpolated quarterly. The series was extended until 2002Q4 using interpolated quarterly data obtained from the (also re-based) IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

29 - SINGAPORE

29.1 - Raw Series Used:

A - IFS quarterly GDP at 1990 prices from 1993Q2 until 2002Q3.

B - IFS quarterly volume index (1995=100) from 1984Q3 until 2002Q3.

C - IFS annual GDP at 1990 prices from 1984 until 2001.

D - IFS annual volume index (1995=100) from 1970 until 2001

E - IFS exchange rate (National Currency per U.S. Dollar on average).

F - IFS GDP deflator.

G - WEO Annual GDP at 1990 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Millions	57699B.PXF...	GDP AT 1990 PRICES
B	Index Number	IFS	None	57699BVPZF...	GDP VOL. (1995=100)
C	Nat.Currency	IFS	Millions	57699B.PXF...	GDP AT 1990 PRICES
D	Index Number	IFS	None	57699BVPZF...	GDP VOL. (1995=100)
E	Nat.Currency	IFS	None	576..RF.ZF...	National Currency per U.S. Dollar
F	Index Number	IFS	None	57699BIPZF...	GDP DEFL. (1995=100)
G	Nat.Currency	WEO	Billions	W576NGDP_R	GDP AT 1990 PRICES

29.2 - Adjustments Made:

Annual GDP at 1990 prices was extended backwards using the index series, converted to billions of national currency, and interpolated quarterly. Quarterly GDP at 1990 prices series was converted to billions of national currency, annualized and extended backwards using the index series (until 1985Q1) and interpolated quarterly data (from 1984Q4 to 1970Q1). The resulting series was then seasonally adjusted and re-based into 1995 prices. The series was extended until 2002Q4 using the (also re-based) IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

30 - SPAIN (in Euros)

30.1- Raw Series Used:

A - IFS Quarterly GDP at 1995 prices from1998Q1 until 2002Q3.

B - IFS Quarterly volume index (1995=100) from 1970Q1 until 2002Q3.

C - WEO Annual GDP at 1995 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Euros	IFS	Billions	18499B.RZW...	GDP AT 1995 PRICES
B	Index Number	IFS	None	18499BVRZF...	GDP VOL. (1995=100)
C	Euros	WEO	Billions	W184NGDP_R	GDP AT 1995 PRICES

30.2 - Adjustments Made:

GDP at 1995 prices series was annualized, and extended backwards using the index series. The resulting series was then seasonally adjusted. The series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate (i.e., 1 ECU = U.S.$1.31).

31 - SWEDEN

31.1 - Raw Series Used:

A - IFS Quarterly GDP at 1995 prices from 1990Q1 until 2002Q3.

B - IFS Quarterly volume index (1995=100) from 1970Q1 until 2002Q3.

C - IFS exchange rate (National Currency per U.S. Dollar on average).

D - WEO Annual GDP at 1996 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Kronas	IFS	Billions	14499B.PVF...	GDP AT 1995 PRICES
B	Index Number	IFS	None	14499BVPZF...	GDP VOL. (1995=100)
C	Kronas	IFS	None	144..RF.ZF...	Kronas per U.S. Dollar
D	Kronas	WEO	Billions	W144NGDP_R	GDP AT 1995 PRICES

31.2 - Adjustments Made:

GDP at 1995 prices series was annualized and extended backwards using the index series. The resulting series was then seasonally adjusted, extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 dollars using the relevant IFS exchange rate.

32 - SWITZERLAND

32.1 - Raw Series Used:

A - IFS Quarterly GDP at 1990 prices from 1980Q1 until 2002Q4.

B - IFS Quarterly volume index (1995=100) from 1970Q1 until 2002Q4.

C - IFS Quarterly GDP deflator.

D - IFS exchange rate (National Currency per U.S. Dollar on average).

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	14699B.RYF...	GDP AT 1990 PRICES
B	Index Number	IFS	None	14699BVRZF...	GDP VOL. (1995=100)
C	Index Number	IFS	None	14699BIRZF...	GDP DEFL. (1995=100)
D	Nat.Currency	IFS	None	146..RF.ZF...	National Currency per U.S. Dollar

32.2 - Adjustments Made:

GDP at 1990 prices series was annualized and extended backwards using the index series. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator) and converted to 1995 dollars using the relevant IFS exchange rate.

33 - TAIWAN

33.1 - Raw Series Used:

A - WEO Annual GDP at 1996 prices from 1970 until 2004.

B - WEO Annual GDP at current prices from 1970 until 2004.

C - WEO Annual GDP at current prices in U.S. dollars from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	WEO	Billions	W528NGDP_R	GDP AT 1996 PRICES
B	Nat. Currency	WEO	Billions	W528NGDP	GDP at current prices
C	U.S. dollars	WEO	Billions	W528NGDPD	GDP at current prices

33.2 - Adjustments Made:

IMF's World Economic Outlook annual GDP at 1996 prices series (including the 2002 forecast) was interpolated quarterly and re-based into 1995 prices (using the GDP deflator obtained through the comparison of series A and B in 1995) and converted to 1995 dollars (using the value obtained through the comparison of series B and C in 1995).

34 - THAILAND

34.1 - Raw Series Used:

A - IFS quarterly GDP at 1988 prices from 1993Q1 until 2002Q1.

B - IFS annual GDP at 1988 prices from 1980 until 2001.

C - IFS annual volume index (1995=100) from 1970 until 2001

D - IFS exchange rate (National currency per U.S. dollar on average).

E - IFS GDP deflator.

F - WEO Annual GDP at 1988 prices from 1970 until 2004.

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	57899B.PYF...	GDP AT 1988 PRICES
B	Nat.Currency	IFS	Billions	57899B.PYF...	GDP AT 1988 PRICES
C	Index Number	IFS	None	57899BVPZF...	GDP VOL. (1995=100)
D	Nat.Currency	IFS	None	578..RF.ZF...	National Currency per U.S. Dollar
E	Index Number	IFS	None	57899BIPZF...	GDP DEFL. (1995=100)
F	Nat.Currency	WEO	Billions	W578NGDP_R	GDP AT 1988 PRICES

34.2 - Adjustments Made:

Annual GDP at 1988 prices was extended backwards using the index series and interpolated quarterly. Quarterly GDP at 1988 prices series was seasonally adjusted, annualized and extended backwards using interpolated quarterly data. The resulting series was then re-based into 1995 prices (using the relevant GDP deflator). The series was extended until 2002Q4 using (re-based) interpolated quarterly data obtained from the IMF's World Economic Outlook 2002 forecast and converted to 1995 dollars using the relevant IFS exchange rate.

35 - UK

35.1 - Raw Series Used:

A - IFS Quarterly GDP at 1995 prices from 1970Q1 until 2002Q4.

B - IFS exchange rate (U.S. Dollars per National Currency on average).

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat.Currency	IFS	Billions	11299B.RZF...	GDP AT 1995 PRICES
B	U.S. dollars	IFS	None	112..RH.ZF...	U.S. Dollars per National Currency

35.2 - Adjustments Made:

Series	UNITS	SOURCE	SCALE	SERIES_CODE	DESCRIPTOR
A	Nat. Currency	IFS	Billions	12899B.PZF...	GDP AT 1995 PRICES
B	Nat. Currency	IFS	Billions	12899B.PZF...	GDP AT 1995 PRICES
C	Nat. Currency	IFS	None	128..RF.ZF...	National Currency per U.S. Dollar
D	Nat. Currency	WEO	Billions	W128NGDP_R	GDP AT 1995 PRICES

37.2 - *Adjustments Made:*

Quarterly real GDP at 1995 prices was annualized, seasonally adjusted and extended backwards using interpolated quarterly data from the annual series (from 1987Q4 until 1970Q1). The resulting series was extended until 2002Q4 using the IMF's World Economic Outlook 2002 forecast, and converted to 1995 U.S. dollars using the relevant exchange rate.

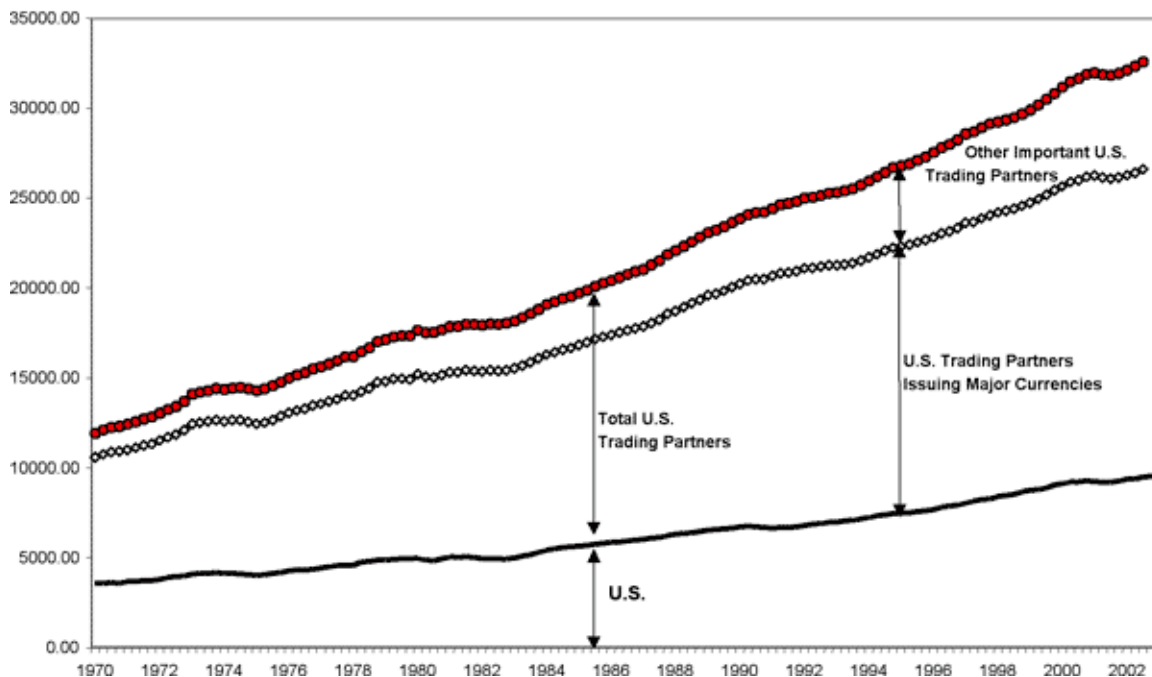Figure 1: U.S. and Trading Partner GDP (Direct Sum)
millions of 1995 U.S.$

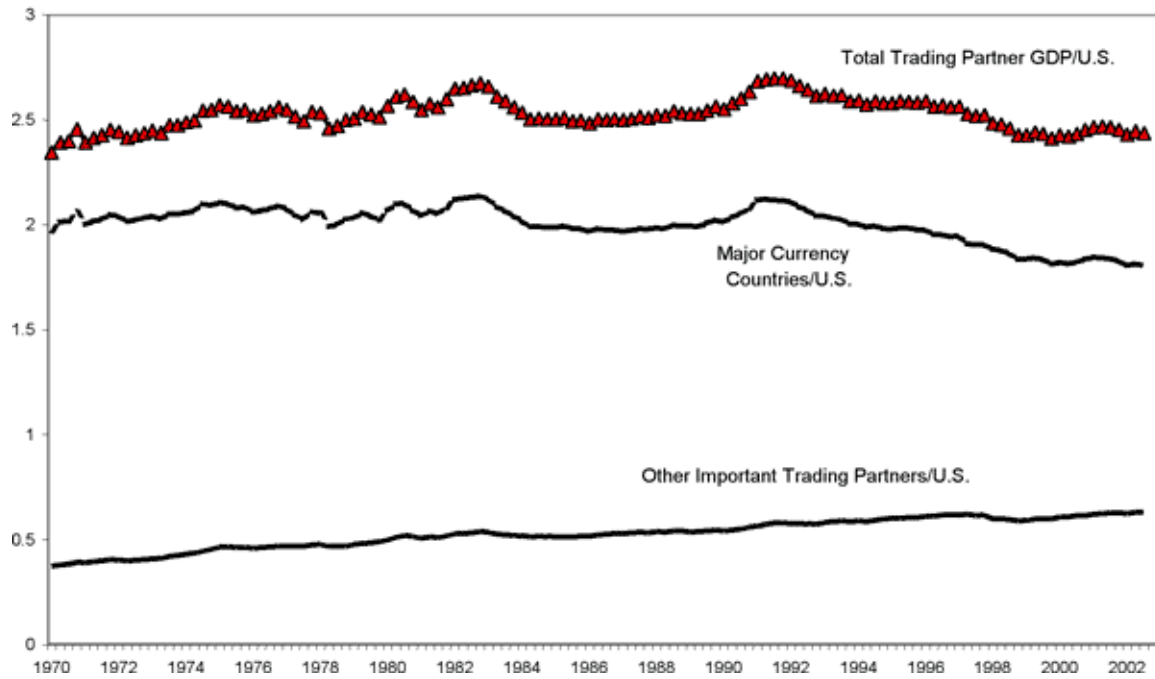Figure 2:Trading Partner Real GDPs Relative to U.S. Real GDP
millions of 1995 U.S.$

Figure 3: Trading Partner Real GDP Measures
millions of 1995 U.S.$

Legend:
- WDEM4 (2001 weights)
- WDEM2 (Moving weights)
- WDEM3 (1971 weights)
- WDEM5 (Spliced decennial weights)
- WDEM1 (Direct Sum)
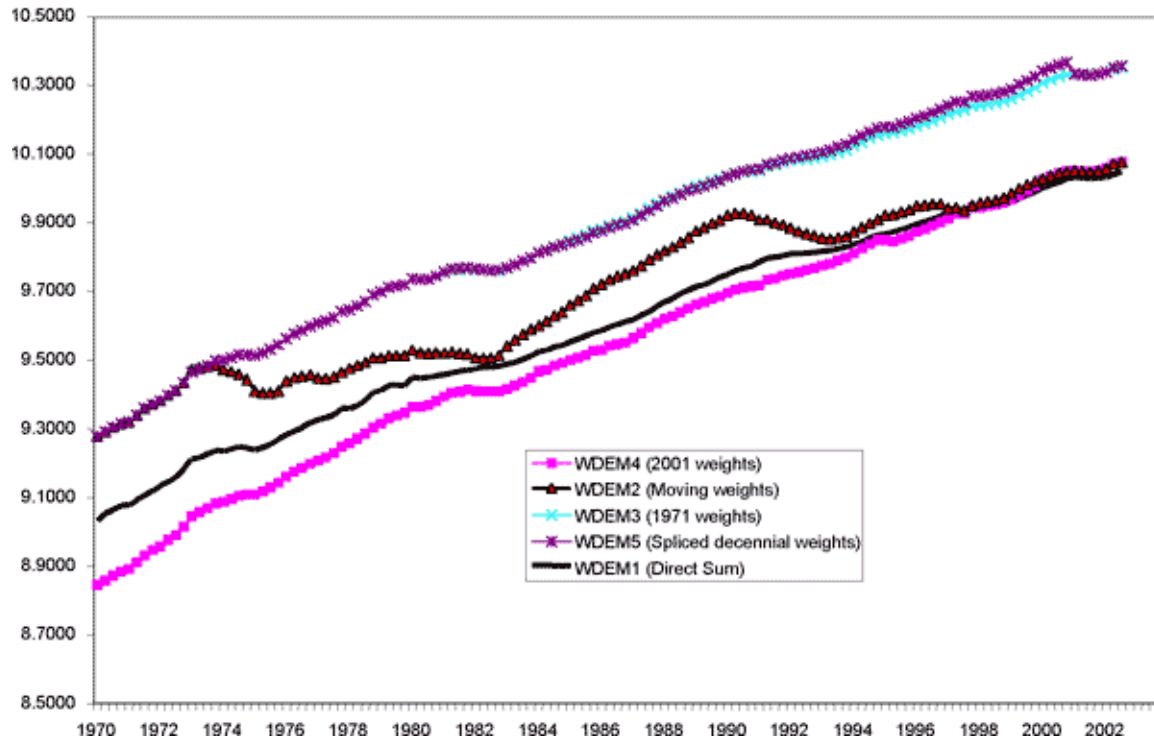
Figure 4: Direct Sum Trading Partner GDP and U.S. Exports
millions of 1995 U.S.$

Annual growth rates

Legend:
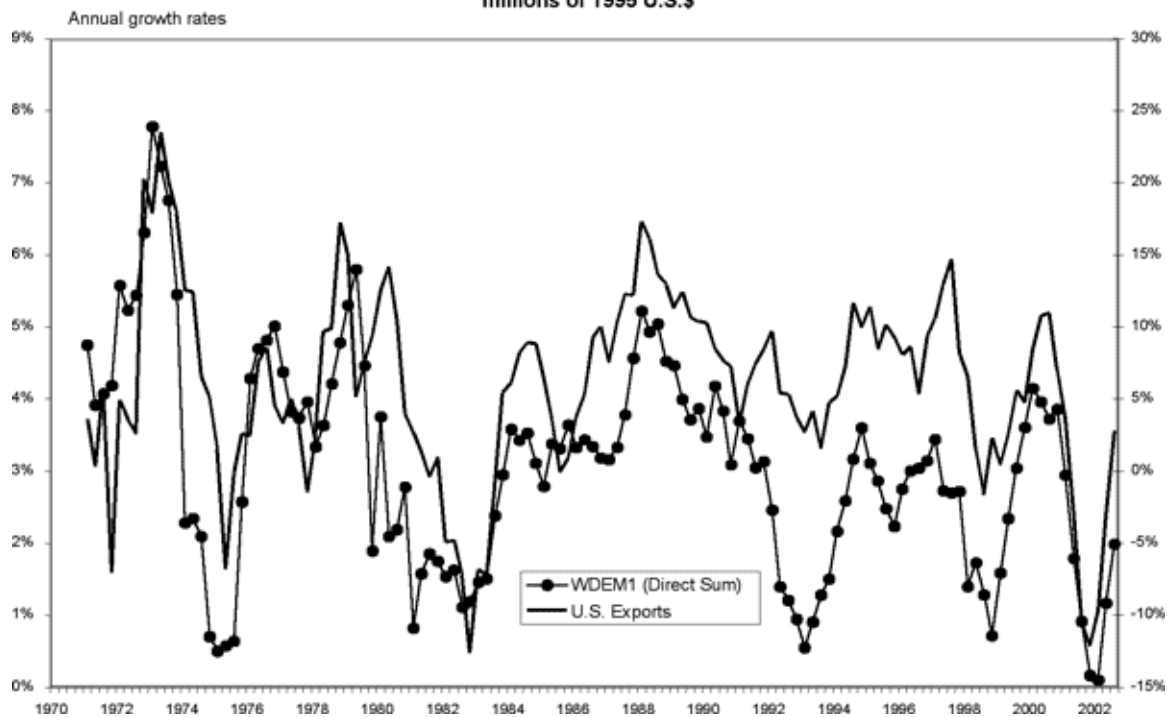- WDEM1 (Direct Sum)
- U.S. Exports

Figure 5: Fixed Weight Trading Partner Real GDPs and U.S. Exports
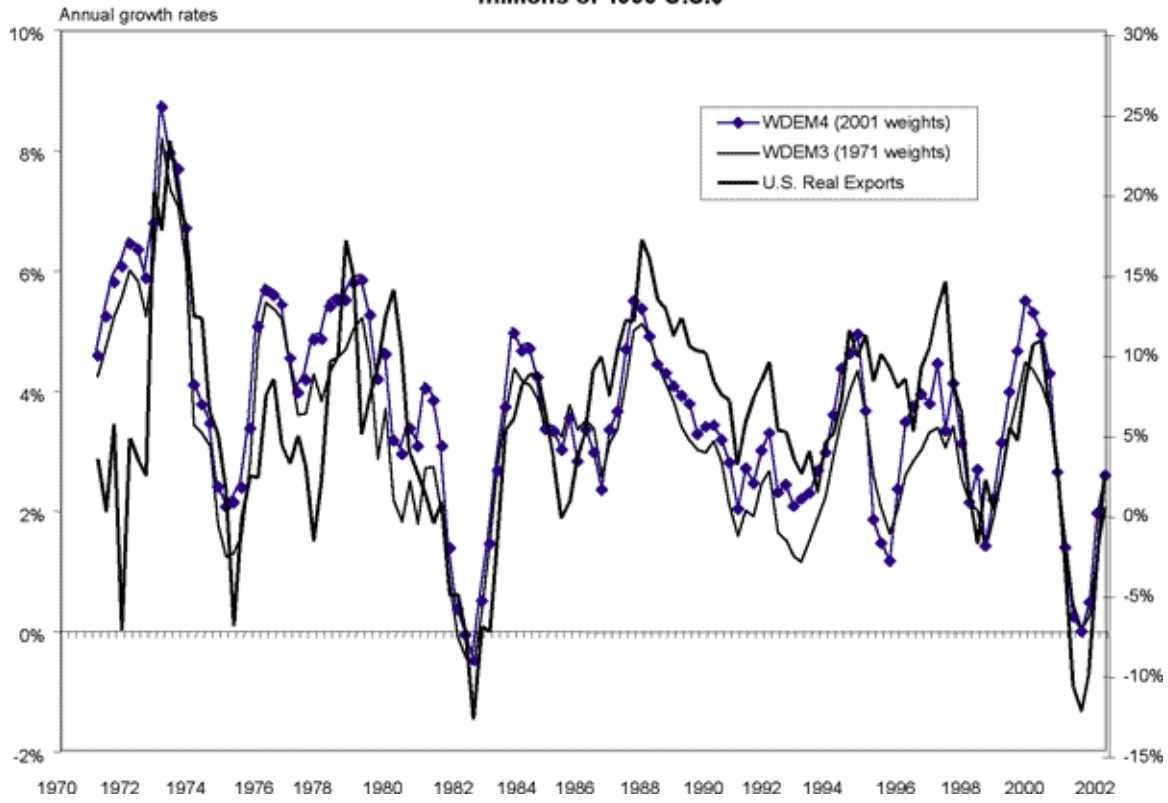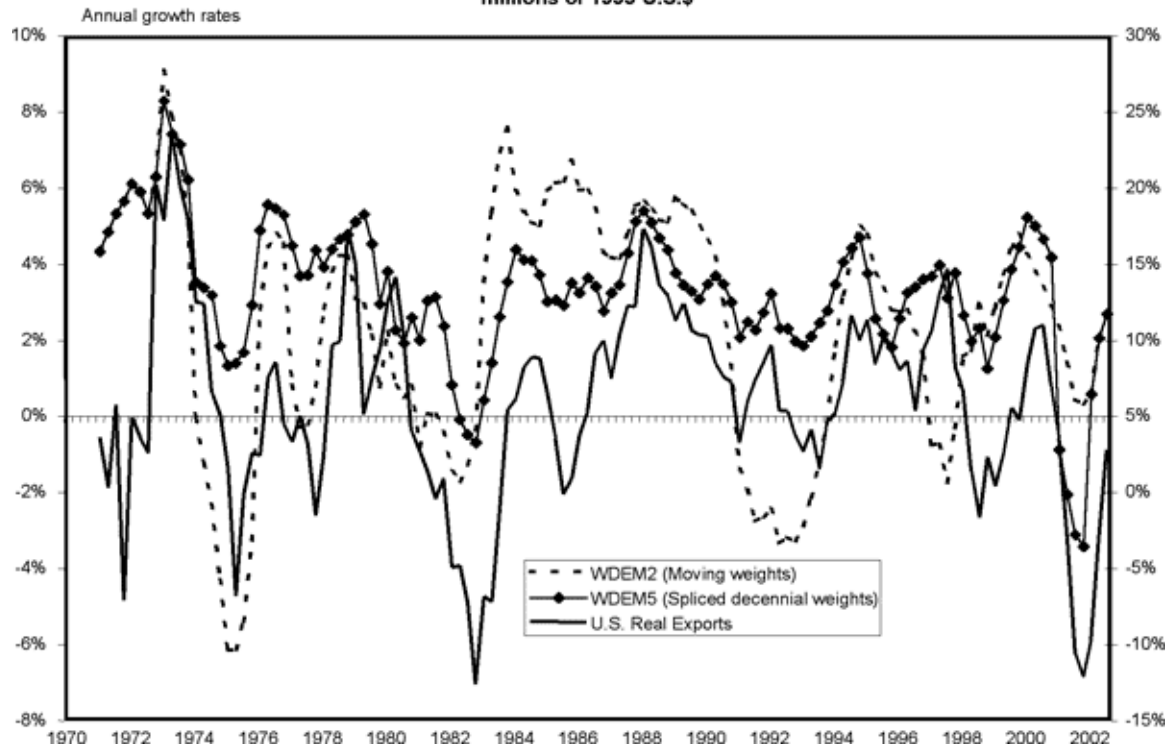### millions of 1995 U.S.$

Figure 6: Variable Weight Trading Partner Real GDPs and U.S. Exports
millions of 1995 U.S.$

NOTES:

1. See the Federal Reserve's "H.10 Statistical Release" (various dates) and Leahy (1998) for details. As put by Leahy (1998, p.811), this "group (...)" of countries (and currencies) "is that of (...) important U.S trading partners."
2. Belgium and Luxembourg are treated as a single country by the Federal Reserve.
3. The share of these countries in total U.S. exports of goods has fluctuated between 87% and 90% according to data from the United States International Trade Commission (available at http://www.usitc.gov/).
4. Such measures are directly available in the World Bank's "World Economic Indicators." One can also construct similar measures from the data available in IMF's "World Economic Outlook," although this requires more effort.
5. Chinn (2003, p. 33) cites "personal communication from Federal Reserve" as the source of his data, without any further details. The Federal Reserve definition of "major" U.S. trading partners is discussed in our subsequent text.
6. This measure was developed by Francis Cripps for use in the Cambridge World Economic Model. It consists of quarterly estimates export-share weighted U.S. trading partner real GDP, in constant 1975 U.S.$. See "World Trade and Finance," *Cambridge Economic Policy Review*, December 1980.
7. In such case, the export-shares are of course adjusted to reflect the actual countries covered. It is our intention to extend our databank even further in the future, e.g., to encompass all OECD

countries.

8. As mentioned before, these weights are used to calculate the Federal Reserve's "broad exchange rate index." They are "updated annually to incorporate changes in trade patterns" (see Leahy, 1998, p.812) - and are readily available in http://www.federalreserve.gov/releases/h10/weights/. They do not, however, take into consideration military exports on the grounds that the "broad exchange rate index" is meant to be a "measure of trade competitiveness" and "trade competitiveness is unlikely to play an important role in the determination of U.S military exports" (Leahy, 1998, p.816).

9. For instance, annual data would be missing for countries like Malaysia (series start in 1970), Portugal (series start in 1969), Israel (series start in 1968), Colombia (series start in 1968), Saudi Arabia (series start in 1968), Austria (series start in 1964), Brazil (series start in 1963), etc.

10. Such as, say, the facts that it contains no data on Taiwan, its Chilean real GDP series stops in 1998Q1, or its Israeli real GDP series stays constant for a couple of years in the early 1970s.

11. We note, with a certain surprise, that both IMF databanks are not always consistent.

12. Whenever there were discrepancies between the data from these sources and the IFS (and no obvious problems with the latter) we used IFS data. A "IFS-based" databank was justified by our willingness to use - as much as possible - the same source for all countries in the sample. The alternative databanks available (notably OECD's) deal with narrower sets of countries and, therefore, have to be complemented with IFS data anyway. Given that OECD data is (as it turns out) compatible with ours and more readily available, we plan to use it in future updates.

13. The date above refers to Belgian data. Quarterly data on Luxembourg (whose GDP is roughly 6% of Belgium's) was obtained by interpolating the annual series available. See the Appendix for details.

14. The series actually goes back to 1977:1, but we chose not to use it before 1988. See the Appendix for details.

15. We chose not to use the IFS GDP at 1970 prices series available from 1975:1 to 1991:1. See the Appendix for details.

16. The series for Argentina is, however, interrupted in 1980:4. See the Appendix for details.

17. We chose not to use the quarterly GDP at factor prices series available from 1996:4 onwards. See the Appendix for details.

18. The series actually goes back to 1970:1, but we chose not to use it before 1980. See the Appendix for details.

19. It should be noted that while most countries provide fixed-base-year real GDP measures, a few countries including Brazil, France and the Netherlands provide chained series. We did not address this difference.

20. With the exception of Taiwan. Given the lack of Taiwanese data on the IFS we were forced to get the relevant 1995 exchange rate from comparing the WEO current price Taiwanese GDP series in both national currency and dollars.

21. Quarterly geometric averages were derived by first creating an arithmetic export-share-weighted average of the natural logarithms of the country real GDPs, and then taking the anti-log of the resulting number.

22. Having verified that all variables are integrated of order one, we chose a general dynamic specification with no contemporaneous regressors, in order to avoid possible endogeneity problems. Since the purpose of our exercise was limited to comparing the outcome of a general equation under different choices of the world GDP indicator, we concentrated on general tests of mis-specifications without attempting to arrive at more parsimonious representations.

23. WEO series include forecasts for 2002, 2003 and 2004.

24. The interpolation method used was the "Quadratic: match average" in Eviews. This "fits a local quadratic polynomial for each observation of the low frequency series, then use this polynomial to

fill in all observations of the high frequency series associated with the period. The quadratic polynomial is formed by taking sets of three adjacent points from the source series and fitting a quadratic so that the average of the high frequency points match to the low frequency data actually observed. For most points, one point before and one point after the period currently being interpolated are used to provide the three points. For end points, the two periods are both taken from the one side where data is available" (Quantitative Micro Software, 2000, "Frequency Conversion").

25. We used the so-called "x11" method for seasonal adjustments - all of which were done in E-Views.

26. This last series is from the Brazilian Ministry of Planning's "Instituto de Pesquisa Economica Aplicada (IPEA)" web page at http://www.ipeadata.gov.br/

27. The Brazilian national currency changed twice between 1990 and 1995, so it is important to note that our re-based 1995 figures are in billions of the 1995 (and present) currency.

28. This last series is from the Chilean national statistics web page at http://www.ine.cl/11-pib/i-pib.htm

29. We chose not to use the IFS GDP at 1970 prices series available from 1975Q1 until 1991Q1.

30. We chose not to use the IFS quarterly GDP at 1993-1994 factor prices series (available from 1996Q4 until 2002Q2 and not seasonally adjusted).

31. The IMF series actually covers the whole period, but the behavior exhibited by the International Financial Statistics series in the 1970's (both quarterly and annual) is so peculiar that we preferred to use interpolated data from the annual series available in the World Economic Outlook for this period.

32. The IMF series actually goes back to 1977Q1, but the problems with this series (including inconsistencies between quarterly and annual series) led us to drop it before 1988.