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*In this number :  
Indicators of price and  
cost competitiveness*

## 1. INTRODUCTION

*The recent fluctuations in the value of the dollar and the yen have once more brought questions of price and cost competitiveness to the fore. The current paper presents a number of indicators of price and cost competitiveness (including nominal and real effective exchange rates), that are often quoted in analyses of the economic impact of currency fluctuations. It highlights the sometimes important differences between these indicators, and shows some of the pitfalls in their interpretation.*

*Section 2 presents the key concepts in the calculation of nominal and real effective exchange rates. The remainder of the paper illustrates these concepts with realistic examples. A final section offers some conclusions.*

*All calculations have been carried out with the recently developed computer programme FX, that offers great flexibility in terms of choice of competitor countries<sup>1</sup>, reference period, trade weight calculation, etc. Another feature of the application is its ability to calculate effective exchange rates for groups of countries (such as the European Union, NAFTA, etc.). The programme is used as well to prepare the DG II "Quarterly report on the price and cost competitiveness of the European Union and its Member States"<sup>2</sup>.*

<sup>1</sup> The data sources used by the FX programme depend on the choice of competitor countries (see Box).

<sup>2</sup> This report is available on our Internet Web site "<http://europa.eu.int/en/record/otherdoc.html>". This site also offers the possibility to request a paper copy of the report.

## 2. KEY CONCEPTS

The **nominal effective exchange rate (NEER)** describes the changes in value of a currency with reference to a given base period. It is calculated as a trade-weighted geometric average of bilateral exchange rates against the currencies of competing countries.

The **real effective exchange rate (REER)** is the main indicator of price and cost competitiveness. It is calculated as the sum<sup>3</sup> of the NEER and a **trade-weighted price or cost deflator**. The REER attempts to show the movements in the prices or costs of production of domestically produced goods relative to the prices or costs of goods produced by competitor countries, when expressed in a common currency.

Real effective exchange rates are often used to detect misalignments from a **Purchasing Power Parity (PPP) equilibrium**. In its **'absolute' version**, a PPP equilibrium implies that a given country's prices or unit labour costs (expressed in a common currency) are equal to those in its competitor countries. However, empirical evidence shows large and persistent deviations of exchange rates from price or cost parity especially over the short- and medium-term and therefore does not support this version of PPP. More comprehensive models that calculate equilibrium exchange rates do exist, but are beyond the limited scope of this paper.

Alternatively, misalignment from an equilibrium exchange rate may be detected using PPP or price/cost parity in its weaker **'relative' version**, i.e. in terms of rate of change. In comparison with a **reference period** to be chosen, the change in a given country's prices or unit labour costs (expressed in a common currency) must be equal to that of its competitor countries. In this reference period the country's economy is considered to have been in both internal and external equilibrium. This is the approach taken in this paper. Two problems are associated with it: first, the choice of a period in which a country's position can be considered as being in equilibrium is difficult; and second, equilibrium exchange rates are not constant over time.

Various **price and cost deflators** can be used to transform nominal exchange rates into real rates. The **FX** computer programme distinguishes:

- (1) the Consumer Price Index (CPI);
- (2) the GDP deflator;
- (3) the price deflator of exports of goods and services;
- (4) Unit Labour Costs in Economy as a whole (ULCE);
- (5) Unit Labour Costs in Manufacturing (ULCM).

Various **trade weights** can be used to transform bilateral exchange rates and national price or cost deflators into effective exchange rates and effective deflators. **Bilateral import weights** are defined as the shares of a country's imports arriving from its competitor countries. **Bilateral export weights** are similarly defined as the shares of a country's exports destined to its competitor countries. **Double export**

**weights** reflect not only competition in the **home markets of the various competitors**, but also competition in **export markets elsewhere**. Combinations of export and import weights are sometimes used as well, but the illustrations presented below concern export weights only.

In this paper, three alternative sets of **competitor countries** are considered: in Section 3, these are the 15 Member states of the European Union (EUR15); in Section 4, EUR15 as a group competing against the United States; and finally in Section 5, 23 industrial countries (IC23<sup>4</sup>) that are members of the OECD.

## 3. PRICE AND COST COMPETITIVENESS OF THE UNION MEMBER STATES

Exchange rates are the starting point of any analysis of price and cost competitiveness. Within the European Union, the German mark is a key reference currency. The **bilateral exchange rates** between the various national currencies and the German mark are closely followed by policy makers. However, the **Nominal Effective Exchange Rate** provides more information, as it tracks not only the exchange rate against the mark, but also that against the other European currencies.

Since 1979, for instance, the bilateral exchange rate between the Dutch guilder and the German mark has hardly moved (see Graph 1). The NEER of the guilder against the other EU currencies, however, had appreciated by almost 40% in 1995 and has depreciated by 5% since then. The movement of the NEER of the mark is fairly similar to that of the guilder, with one important exception: both the mark's rate of appreciation (65%) and its rate of depreciation (7%) have been much sharper. **The application of trade weights in the calculation of nominal effective exchange rates explains the lower volatility of the guilder compared to the mark.** Germany is a very important trading partner for the Netherlands (1995 double export weight = 36%) and the NLG/DEM rate has been very stable. The 1995 double export weight of the Netherlands for Germany, on the other hand, is significantly smaller (10%) and the moderating influence of the stable NLG/DEM rate on the NEER of the German mark is therefore less important as well.

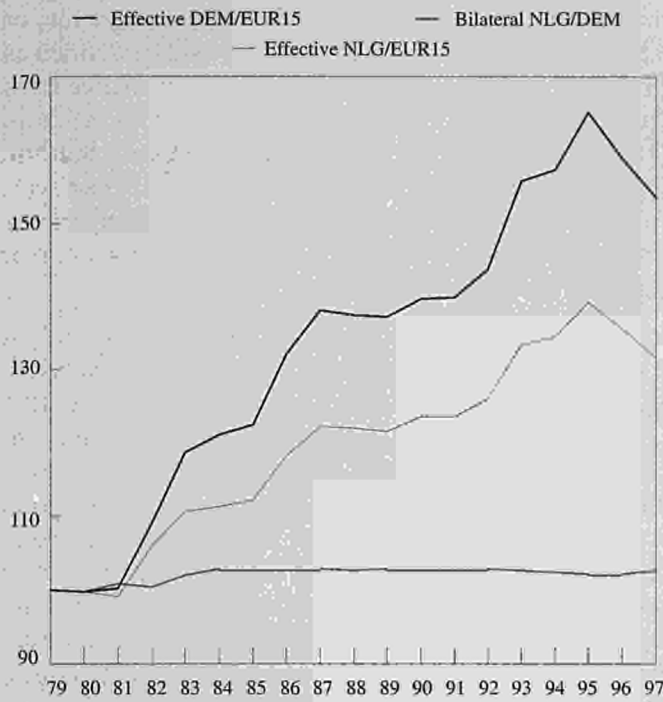
**Double export weights** are most often used to calculate effective exchange rates. They are a better measure of the relative importance of the competitors considered, because they take into account not only the share of the various export markets of a given country (as is the case if one calculates bilateral export weights), but also indirect competition

<sup>3</sup> Strictly speaking:  $\ln(\text{REER}_t/\text{REER}_{t-1}) = \ln(\text{NEER}_t/\text{NEER}_{t-1}) + \ln(\text{Deflator}_t/\text{Deflator}_{t-1})$ , where  $t$  refers to the current period and  $t-1$  to the base period. Usually, the nominal and real effective exchange rates as well as the trade-weighted deflators are expressed as indices.

<sup>4</sup> The EU Member States, the US, Japan, Norway, Switzerland, Canada, Australia, New Zealand, Mexico and Turkey.

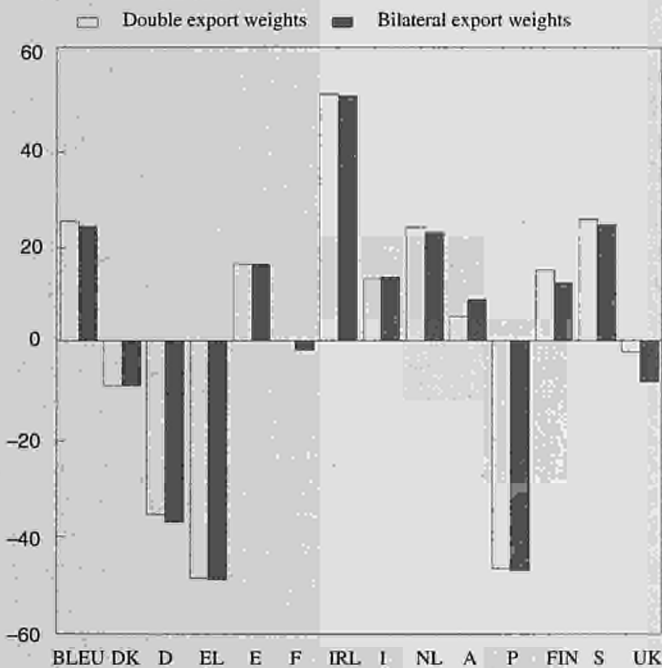


GRAPH 1: Bilateral and effective <sup>(1)</sup> nominal exchange rates of the Dutch guilder and German mark



<sup>(1)</sup> relative to the European Union (EUR15). Index 1979=100.

GRAPH 2: Cost competitiveness <sup>(1)</sup> relative to the European Union 1979-96



<sup>(1)</sup> Cost competitiveness as measured by the inverse of the nominal effective exchange rate deflated by Unit Labour Costs in Manufacturing (ULCM). A positive sign illustrates a gain.  
<sup>(2)</sup> % change 1996/1979.

started its operations. Two measures of cost competitiveness are presented: one based on double export weights, the other on bilateral export weights. The differences between those two measures do not appear to be very important. Only in the case of the United Kingdom, does the difference between cost competitiveness calculated with double export weights and that calculated with bilateral export weights exceed 5 percentage points. One of the explanations for this discrepancy is that in 1995 Germany's double export weight (29%) was well above its bilateral export weight (22½%)<sup>6</sup>. Because Germany is a country that has experienced losses in cost competitiveness, the UK's relative position will look better if the higher double export weight is used (see Graph 2).

Another, perhaps more important choice to make, is the selection of the price or cost deflator used to transform nominal exchange rates into real rates (a rise in the real exchange rate is considered to represent a loss in price or cost competitiveness). Section 2 above lists the five deflators used in the FX programme. As Graph 3 illustrates the choice of deflator can have important implications. In Germany, the real effective exchange rate based on Unit Labour Costs in Manufacturing (ULCM) – a deflator commonly used – has risen much more rapidly than the real exchange rates based on other deflators. While the use of ULCM would lead one to conclude that Germany suffered an important loss (of 35%) in cost competitiveness over the period 1979–1996 (see Graph 2), this would not be the case if one of the other deflators had been used<sup>7</sup>. In France, the choice of deflator makes less of a difference. All indicators show cost competitiveness gains of less than 10%. Finally, in Spain the real effective exchange rates based on Unit Labour Costs (ULCM and ULCE) show cost competitiveness gains between 10% and 20%, while those based on the other deflators show very little difference between the situation in 1979 and 1996.

These three examples demonstrate that the choice of deflator may strongly affect the real effective exchange rates calculated. Therefore, this choice should be carefully considered. An analysis of world market shares would use the export price deflator, while an investigation of employment growth would focus primarily on the cost competitiveness indicators based on unit labour costs. Preferably, the economic analysis should consider real exchange rates based on several deflators. As illustrated in the previous paragraph, real exchange rates based on unit labour costs (particularly those in the manufacturing sector) will show greater disparities between the Member States, while those based on the export price deflator will be relatively stable. Export prices are often set at world markets and are less likely to differ between countries (at least, after correction for exchange rate movements).

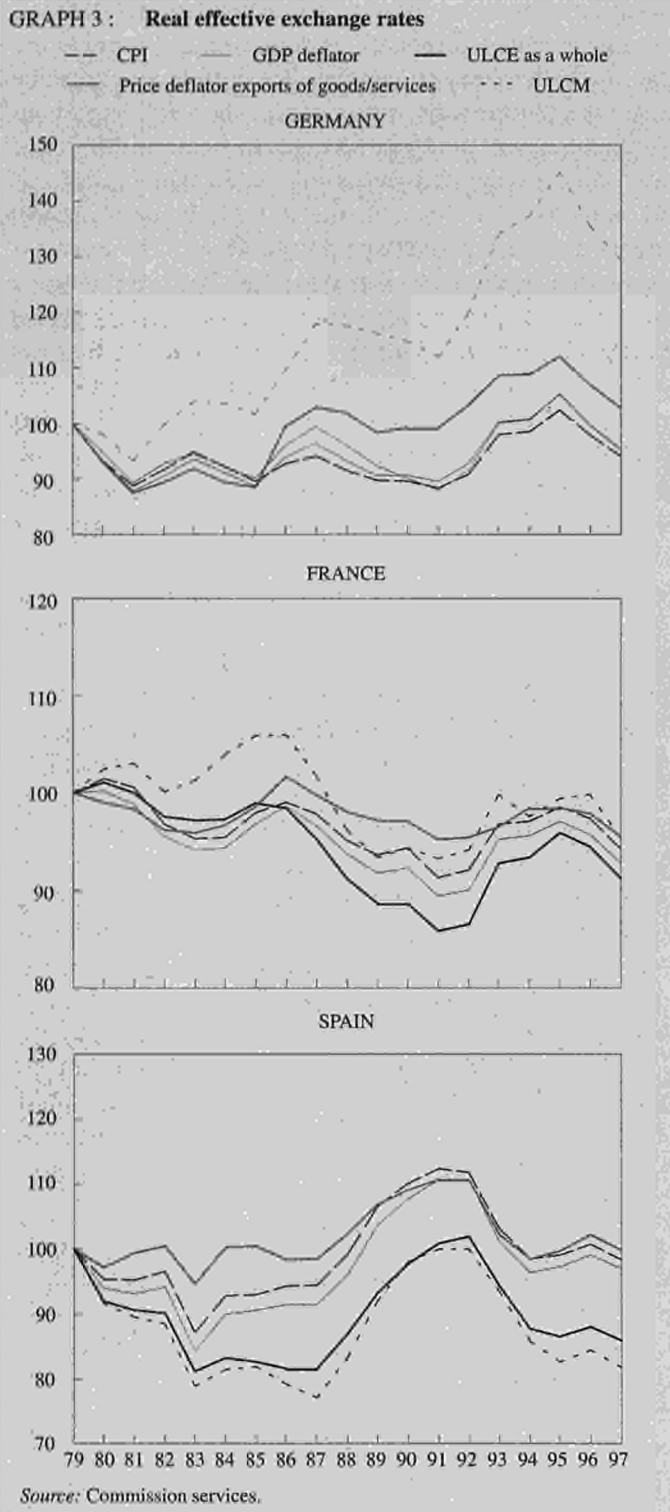
<sup>5</sup> In the case of bilateral export weights, markets are limited to the competing countries themselves (i.e. the EU Member States). In the case of double export weights, all world markets are taken into consideration (including the rest of Europe, the Western Hemisphere, Asia/Oceania, Africa and the Middle East).

<sup>6</sup> While only 22½% of British exports to the European Union had Germany as destination, the strength of German exports to important British markets such as France and the Netherlands was sufficient to raise the double export weight of Germany for the UK to 29%.

<sup>7</sup> The German real effective exchange rate calculated with data on the CPI, the GDP deflator or ULCE even showed minor gains in price and cost competitiveness for this same period.

in third markets<sup>5</sup>. Bilateral export and bilateral import weights are sometimes used as well, because they are easier to calculate and not that different from double export weights. For example in 1995, both the double and bilateral export weights of Germany for the Netherlands rounded off to 36%, while the bilateral import weight equalled 35%.

This also explains why the choice of trade weights has only a limited impact on the cost competitiveness measures calculated. Graph 2 summarises the changes in cost competitiveness recorded by the Union Member States since 1979, when the Exchange rate Mechanism (ERM)



#### 4. PRICE AND COST COMPETITIVENESS OF THE EU RELATIVE TO THE USA

As mentioned in the introduction, **FX** provides the possibility to define country groups (such as the European Union or NAFTA) that in the subsequent calculations are treated as a single country. In a comparative analysis of the cost competitiveness of the USA and the EU, for instance, it might be preferable to treat the **European Union as a single economic entity** rather than as **15 separate countries**. The main difference between these **two options** is that in the first case intra-EU exports are part of home production, while in the second case they are exports competing with exports from the United States in the various

Union markets<sup>8</sup>. A second implication of treating the Union as a single economic entity is the creation of a fictive currency for the EU group. The bilateral exchange rate of such a currency against the US dollar would be defined as an indexed weighted average of the dollar exchange rates of the EU currencies. The Member States' shares in extra-EU exports would be used as weights. **It turns out that the difference between both options is marginal.** The development over time of US cost competitiveness relative to the European Union as a group is practically identical to that relative to the 15 Member States.

A more important choice is that of the **reference period**. In the above examples we have used 1979 as reference period, but a priori there is no guarantee that at the start of the ERM in 1979 both the EU and US economy were in equilibrium. In addition, equilibrium exchange rates change over time, influenced by both structural change and real shocks. This poses a problem, particularly if one wants to use early reference years to assess the current value of the US dollar against the European currencies. One could argue that the policies of the Reagan administration in the first half of the 1980s that led to a sharp rise in the real value of the dollar, worries about US competitiveness in international markets and a restructuring of the US manufacturing industry, represented a real shock that would make a choice of reference period in the 1970s or early to mid 1980s less appropriate.

Concentrating on the second half of the 1980s and the first half of the 1990s, a **number of indicators describing both the internal and external position of the European Union and the United States** are investigated.

**Internal balance** implies output growth that is near potential combined with a low and sustainable rate of inflation. Therefore, the following internal indicators may be taken into consideration:

- **Output growth.** Since 1985, the United States economy has grown at a relatively steady pace of 2% to 4% per annum, interrupted by a minor recession in 1991 (see Graph 4.1). From the American perspective, the turn of the decade<sup>9</sup> is clearly a less suitable reference period. In the European Union, the slow-down in economic growth in the early 1990s would seem to eliminate those years (up until 1993) as period of reference.
- **Rate of inflation.** These arguments are reinforced by an investigation of inflation rates (see Graph 4.2). In the US, the GDP price deflator rose to above 4% in 1989 and 1990, while in the EU it rose to above 5% in 1990 and 1991.

**External balance** implies that the current account position and the exchange rate are sustainable and stable in the medium term. The current account need not be balanced.<sup>10</sup> The following external indicators may be taken into consideration:

<sup>8</sup> When calculating double export weights.

<sup>9</sup> A reference period should not be too short, because the equilibrium should be sustainable in the medium term.

<sup>10</sup> A current account deficit, for example, is sustainable in the medium term if it is used to finance long term growth.

**Box 1: Data sources used in the FX programme**

The principal innovation of FX is that the country coverage is flexible. The reference group of competing countries can be chosen by the user. The data sources used by FX depend on this choice. If the competing countries are a subset of 23 Industrial Countries (IC23 as defined in Footnote 4), the DGII AMECO and TXI data bases are a primary source. AMECO contains harmonised national accounts data, while TXI provides information on exchange rates. If one wants to consider a country's price or cost competitiveness relative to a wider group of countries, including a number of newly industrialised and developing economies, the FX programme consults the IMF International Financial Statistics (IFS). The illustrations in the present paper, however, concern the IC23 only.

The calculation of real effective exchange rates requires information on:

- bilateral exchange rates of the competing countries;
- deflators in the competing countries; and
- bilateral trade flows and production for the home market by competing countries (in order to calculate trade weights).

For the 23 industrial countries (IC23) **exchange rate data** are taken from the TXI (DGII) data base. TXI contains the official daily rates recorded at 14.15 hours. Monthly figures are calculated as the arithmetic means of the daily rates. Quarterly and yearly data are geometric means of these monthly data. For the wider World Economy (WE) group of countries, exchange rate data are available from the IMF's International Financial Statistics (IFS), updated with data provided by TELE-RATE/REUTERS.

Annual figures on the **deflators** of the IC23 (including Commission forecasts for the current year) are taken from the AMECO (DGII) data base. If quarterly figures are required, the annual data from AMECO are transformed into quarterly data by applying a cubic spline function. For the WE group, information on deflators is available in the IFS data base, that is linked to the FX programme.

The source of data on **bilateral imports and exports** is the IMF Direction of Trade Statistics. Data on **home production** (defined as GDP minus total exports) are national account statistics taken from the AMECO data base for IC23 and the IFS data base for the WE group.

- *Current account.* The 'supply side' policies of the Reagan administration in the first half of the 1980s gave a boost to the US economy from which the current account has never fully recovered. Since 1988, however, the US current account deficit has fluctuated around 2% of GDP, a level that might be sustainable in the medium term. Only during the 1991 recession, did the current account return to balance. During that same year, the EU current account deficit reached a high of 1.4% of GDP. The EU current account was balanced in 1988 and again in 1993 and 1994, making those years good candidates for reference year (see Graph 4.3).
- *Exchange rate variability.* Following the sharp depreciation of the dollar in 1986 and 1987, the nominal effective exchange rate of the US dollar against the European currencies has remained relatively constant (see Graph 4.4). However, short-term volatility has not disappeared. In the years 1985 and especially in 1991-1992 the standard deviation of the monthly changes in the dollar's nominal effective exchange rate against the European currencies was relatively large (see Graph 4.5). Large volatility indicates that no market consensus exists concerning the appropriate value of a currency and that one should be cautious when choosing one of these years as reference period.

Nevertheless, a few suitable reference years remain. In 1988 and 1994, both the EU and the US economy were in relatively good shape<sup>11</sup> and exchange rate movements were moderate. In the analysis below two other reference periods will be considered: 1979, the starting year of the ERM; and the period 1987-1996. **The advantage of taking a rela-**

**tively long period as reference, is that in the absence of structural shocks the long-term average of the real exchange rate will tend towards equilibrium.** For the reasons mentioned above, it would not be a good idea to include the first half of the 1980s in this period, but by 1987 the dollar had climbed down from its heights.

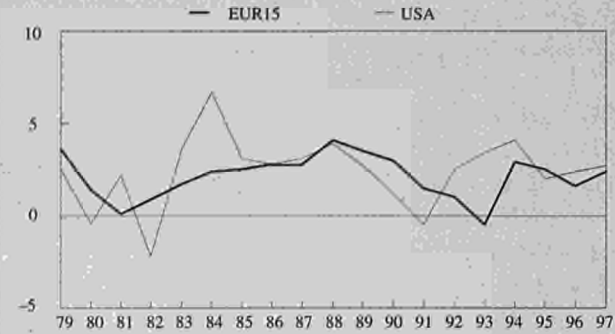
Table 1 presents the 1996 values of the real effective exchange rate (REER) of the US dollar against the European currencies under various assumptions concerning both the reference period and the deflator used. If the REER index were to lie above 100, then according to the relative PPP approach the dollar would be overvalued against the Union currencies. If on the other hand the REER index was less than 100, the conclusion would be that the dollar was below its equilibrium value.

The statistics presented in Table 1 appear to indicate quite clearly that **in 1996 the US dollar was somewhat undervalued against the European currencies**<sup>12</sup>. Except if one takes 1979 as reference period - which as has been pointed out was not a good choice - the 1996 real effective exchange rate of the dollar against the Union currencies is below 100 no matter what deflator is used. The size of the undervaluation of the dollar (or in other words, **the US gain in price and cost competitiveness**), however, varies **substantially: from 1/2%** if Unit Labour Costs in the whole Economy (ULCE) is used as deflator and the period 1987-1996 as reference, **to the 14%** based on the export price deflator and the 1988 base year.

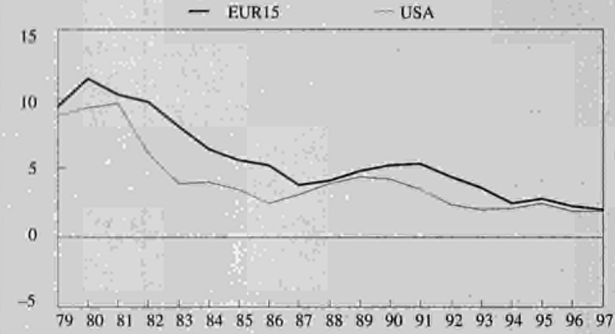
<sup>11</sup> Apart from the structural employment problems in the Union.

<sup>12</sup> Due to the recent appreciation of the dollar, no such clear conclusion can be drawn for 1997.

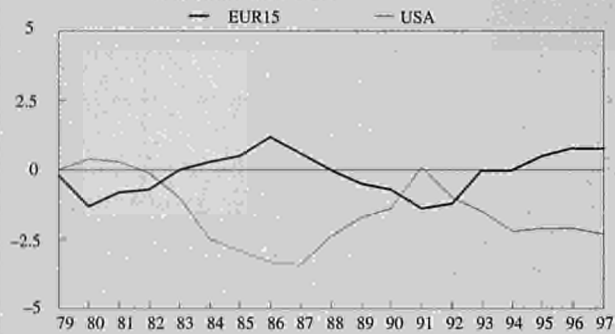
GRAPH 4.1 : Real GDP growth rates (in %) of EUR15 and USA



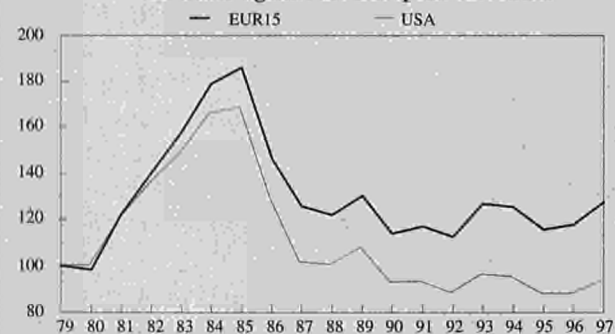
GRAPH 4.2 : GDP price deflator (in %) of EUR15 and USA



GRAPH 4.3 : Balance on current transactions (in % of GDP) of EUR15 and USA

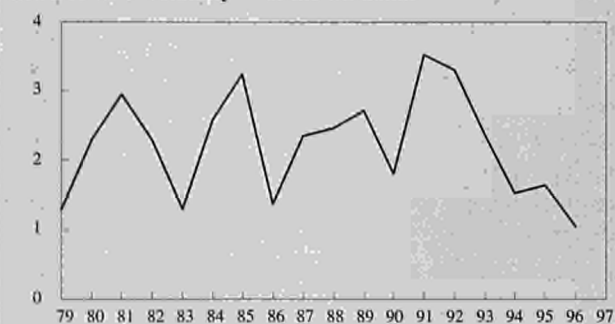


GRAPH 4.4 : Nominal and real <sup>(1)</sup> effective exchange rate of the US dollar against the European currencies <sup>(2)</sup>



(1) Deflator: Unit Labour Costs in Manufacturing (ULCM). Index 1979=100.  
 (2) EUR15 treated as a single country.

GRAPH 4.5 : Volatility <sup>(1)</sup> of the US dollar



(1) Standard deviation of the monthly changes in the US dollar's nominal effective exchange rate.

TABLE 1 : Real effective exchange rate of the US dollar against the European currencies

Deflator	Reference period (index=100)	1996 Value (as an index)
Consumer Price Index CPI	1979	103.2
	1988	93.6
	1994	93.9
	1987-1996	96.0
GDP deflator	1979	98.3
	1988	91.8
	1994	93.6
	1987-1996	95.3
Price deflator exports of goods and services	1979	87.2
	1988	85.7
	1994	93.8
	1987-1996	92.5
Unit Labour Costs, Economy as a whole ULCE	1979	110.2
	1988	96.8
	1994	96.1
	1987-1996	99.4
Unit Labour Costs, Manufacturing ULCM	1979	89.4
	1988	88.0
	1994	92.5
	1987-1996	92.9

Source : Commission services.

The intriguing question is of course, why such developments have occurred. It is always possible to **split up a real effective exchange rate into two components: the nominal effective exchange rate and the effective (= trade-weighted) deflator expressed in national currency**. The 14% gain in US export price competitiveness since 1988, for instance, can be attributed to a 3% nominal effective depreciation of the US dollar against the European currencies and an 11% decline in US export prices relative to those of the EU (when expressed in national currency).

If ULCE are used as deflator, it is possible to go a step further. The 3% gain in US cost competitiveness since 1988 is completely due to the depreciation of the US dollar against the European currencies. **Unit labour costs in the US economy relative to those in the EU economy are unchanged**. While the total is unchanged, its **three components** have changed. The positive effects of (1) a 1½% decline in the real compensation per employee relative to that in the European Union and (2) a 5% decline in the relative price level due to lower US inflation have been cancelled out by a 6½% decline in US productivity relative to that in the European Union<sup>13</sup>.

## 5. COST COMPETITIVENESS RELATIVE TO 23 INDUSTRIAL COUNTRIES

In this section, the year 1988 is used as reference period. The statistics presented in Table 2 measure the change in cost competitiveness<sup>14</sup> over the period 1988-1996 of the European Union Member States, the European Union as a whole, the United States and Japan relative to:

<sup>13</sup> The percentage change in effective unit labour costs (0%) = the change in real compensation per employee (-1½%) + the change in the price level (-5%) - the change in productivity (-6½%).

<sup>14</sup> Based on relative Unit Labour Costs in Manufacturing (ULCM).



TABLE 2 : Development of cost competitiveness in manufacturing, 1988–1996

% Change	Relative to EUR15			Relative to IC21			Relative to IC23		
	NEER <sup>(1)</sup>	ULCM <sup>(2)</sup>	REER <sup>(3)</sup>	NEER <sup>(1)</sup>	ULCM <sup>(2)</sup>	REER <sup>(3)</sup>	NEER <sup>(1)</sup>	ULCM <sup>(2)</sup>	REER <sup>(3)</sup>
BLEU	12.2	-3.7	8.1	12.3	-2.7	9.2	16.1	-6.5	8.6
Denmark	12.5	-3.4	8.8	12.3	-1.8	10.3	15.5	-4.8	9.9
Germany	15.5	-0.5	15.0	13.5	0.9	14.5	21.4	-6.6	13.4
Greece	-43.0	133.3	32.9	-42.9	135.8	34.6	-38.1	114.3	32.6
Spain	-11.6	14.5	1.2	-11.4	15.9	2.8	-6.8	9.8	2.4
France	15.1	-9.8	3.8	14.0	-8.2	4.7	19.3	-12.8	4.0
Ireland	4.0	-32.6	-29.9	3.6	-31.5	-29.1	5.7	-33.1	-29.3
Italy	-21.4	10.6	-13.1	-21.0	11.8	-11.7	-15.5	3.6	-12.5
Netherlands	11.1	-16.2	-6.9	11.1	-15.2	-5.8	15.1	-18.6	-6.4
Austria	9.7	-10.5	-1.9	9.1	-10.0	-1.7	13.9	-14.5	-2.6
Portugal	-9.7	53.7	38.8	-9.5	55.1	40.4	-7.9	52.0	40.0
Finland	-11.5	-11.4	-21.6	-11.0	-10.0	-19.9	-7.8	-13.7	-20.4
Sweden	-12.6	-2.2	-14.5	-12.2	-0.2	-12.4	-9.1	-4.1	-12.8
UK	-18.3	8.2	-11.6	-17.1	9.9	-8.9	-13.1	3.9	-9.7
EUR15	:	:	:	-2.0	5.6	3.6	22.1	-18.3	-0.2
USA	-3.5	-8.8	-12.0	-4.0	-5.3	-9.1	11.5	-16.9	-7.4
Japan	13.8	-6.9	6.0	16.3	-2.2	13.7	20.9	-6.2	13.3

(1)NEER = Nominal Effective Exchange Rate. A minus means a depreciation of the NEER.

(2)ULCM = Relative Unit Labour Costs in Manufacturing (in national currency).

(3)REER = Real Effective Exchange Rate = Relative Unit Labour Costs in Manufacturing (in common currency). A minus means an improvement in cost competitiveness.

EUR15 = The European Union

IC21 = EUR15+USA, Japan, Norway, Switzerland, Canada, Australia and New Zealand.

IC23 = IC21+ Mexico, Turkey.

Source: Commission services.

- the 14 economies within the European Union (EUR15)<sup>15</sup>;
- a group of 21 Industrial Countries (IC21, including the EU Member States, the US, Japan, Norway, Switzerland, Canada, Australia and New Zealand);
- a group of 23 Industrial Countries (IC23, including the IC21 as well as Mexico and Turkey).

As illustrated by Table 2, **the choice of competitor countries has a significantly smaller impact on real effective exchange rates than on the nominal effective exchange rates (NEER) or the effective manufacturing unit labour costs (ULCM expressed in national currency) calculated.** The inclusion of Mexico and Turkey amongst the industrial countries appears to raise the NEER and lower the trade-weighted ULCM of the other countries and country groups. The explanation is that in both Mexico and Turkey, unit labour costs (expressed in national currency) rose at a rapid rate during the period 1988–1996, making the cost performance of the other countries look good in comparison. Similarly, the rapid depreciation of the Mexican peso and the Turkish lira boosted the nominal effective exchange rates of the other countries. Price and cost competitiveness measures are less affected, because the nominal exchange rate effect and the cost performance effect largely offset each other.

The conclusion is that one needs to be very careful in reporting and interpreting changes in nominal effective exchange rates or relative unit labour costs. In order to avoid distortions, it would normally be preferable to exclude Mexico and Turkey from the group of competitor countries. However, if the aim is to analyse developments in cost competitiveness, there is much to be said in favour of including both countries as competitors. Any distortions that may exist due to their high inflation levels and rapid rates of depreciation will be limited in size, because their effects are counterbalancing. The inclusion of Mexico permits a more balanced

evaluation of changes in the price and cost competitiveness of the United States, in particular, while Turkey is part of a customs union with the European Union.

The final column of Table 2 shows that over the period 1988–1996 the European Union's cost competitiveness is unchanged relative to IC23. The United States made some gains (of 7%), while Japan suffered a 13% loss. These summary statistics only provide a partial picture of developments in cost competitiveness over the past decade. Graph 5 illustrates that the 1996 deviations from the 1988 reference values are in fact rather small from a historical perspective. **The real appreciation of the US dollar in the first half of the 1980s and the real appreciation of the Japanese yen in the first half of the 1990s dwarf the current deviations from the PPP equilibrium.**

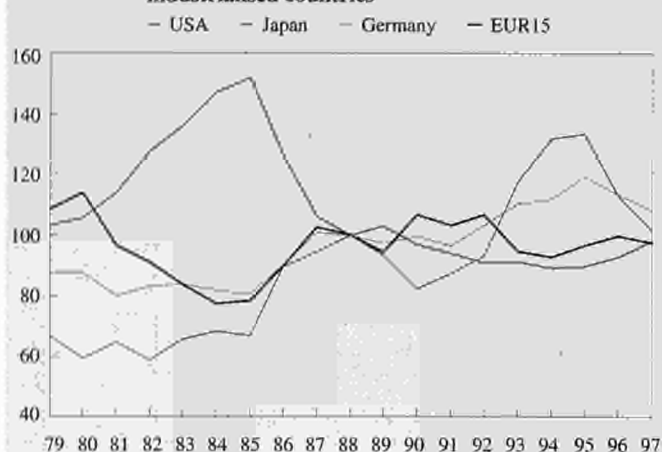
**Developments within the various Union Member States are quite diverse.** While countries like Ireland (30%), Finland (22%), Sweden (14½%) and Italy (13%) notched up important gains in cost competitiveness relative to the EUR15, Portugal (39%), Greece (33%) and Germany (15%) recorded losses (see Table 2).<sup>16</sup> The DGII "Quarterly report on the price and cost competitiveness of the European Union and its Member States" provides further details.

Besides the real effective exchange rates discussed above, **two other competitiveness indicators** merit attention. Both are measures of changes in profitability. The **"effective" profitability of the economy as a whole** compares the trade-weighted change in prices measured by the GDP

<sup>15</sup> The Belgium Luxembourg Economic Union (BLEU) uses a single currency and is therefore treated as a single country.

<sup>16</sup> The Greek and Portuguese series on manufacturing unit labour costs (ULCM) in the DG II AMECO data base are relatively shaky. Both series show sharp increases over the course of the past decade. The ensuing rapid rise in the ULCM-based real effective exchange rates of the Greek drachma and Portuguese escudo may therefore be easily misinterpreted. A formal discussion of developments in price and cost competitiveness in Greece and Portugal should therefore be based on a battery of indicators.

GRAPH 5: Real effective exchange rates <sup>(1)</sup> relative to 23 industrialised countries



(1) Deflator: Unit Labour Costs in Manufacturing (ULCM). Annual data. Index 1988=100.  
Source: Commission services.

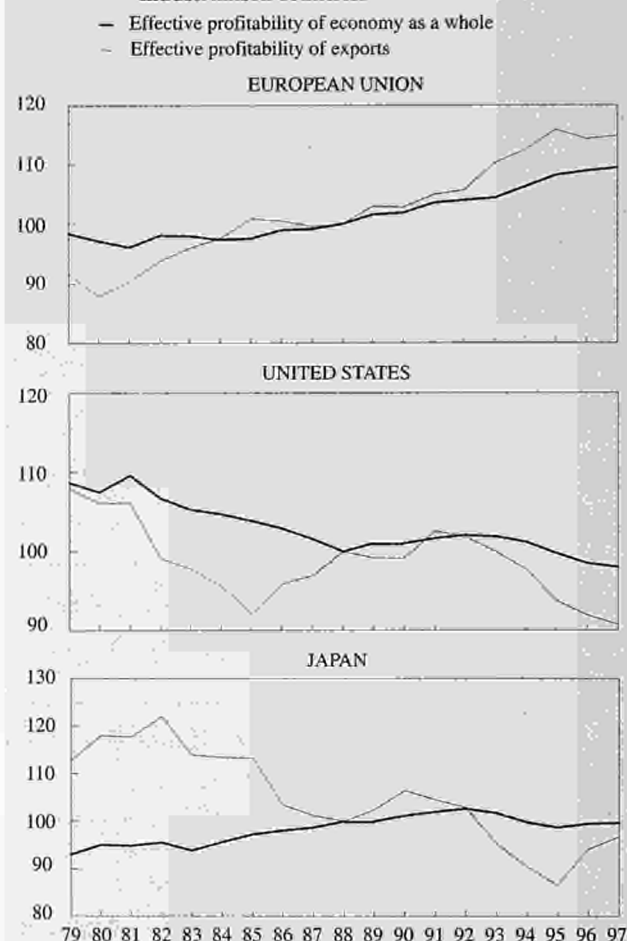
deflator with the trade-weighted change in unit labour costs in the economy as a whole. It is an indicator of the relative profitability of a national economy. The **“effective” export profitability of an economy** is defined as the ratio of the trade-weighted export price index and the trade-weighted unit labour costs in the economy as a whole. It aims to measure the relative profit margins for producers of export goods and services in the various industrial countries.

Graph 6 illustrates developments in effective profitability in the European Union, the United States and Japan. Since 1988, profit margins for EU producers – in particular those active in the export sector – have been rising steadily. Market conditions permitting, **EU exporters have preferred to raise profit margins rather than to increase their share in world markets. In the US and Japan, on the other hand, exporters have been willing to sacrifice profitability in order to maintain or even raise market share.** This was particularly evident in periods of currency appreciation (dollar appreciation in the first half of the 1980s, yen appreciation in 1985–1988 and again in the first half of the 1990s). Japanese producers, in particular, have been able to make those sacrifices, because production for domestic markets has remained relatively profitable throughout the period under consideration. Whereas in the European Union and the United States, economy-wide and export profitability have broadly moved in the same direction (up in the EU and down in the US), in Japan economy-wide profitability has remained steady despite the at times sharp decline in export profitability.

## 6. CONCLUSION

The price and cost competitiveness indicators presented above (real effective exchange rates, nominal effective exchange rates, effective deflators, effective profitability of the economy as a whole, effective export profitability) have

GRAPH 6: Profitability measures relative to 23 industrialised countries



Annual data. Index 1988=100.

many **common characteristics**. They all compare developments over time in one particular country or country group with that in competitor countries. The choice of these competitor countries and their weight clearly affect the effective (= weighted) competitiveness indicators calculated. Another key choice is the selection of a reference period. The current value of an indicator is always compared with that observed during some period in the past, in which the country’s economy is considered to have been in ‘equilibrium’. A final choice, affecting real effective exchange rates in particular, is the choice of deflator.

As these various choices have an important impact on the value of the price or cost competitiveness indicator to be calculated, they should be carefully made. This implies a sufficiently broad selection of key competitor countries; the use of double export weights if quality data are available; a selection of reference period(s) based on an analysis of internal and external equilibrium; and a choice of deflator that is appropriate to the question being posed. In practice, it is to be recommended to consider an assortment of indicators (that is indicators based on the different choices mentioned above) in order to make a more balanced assessment of the price and cost competitiveness of a country.

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