Developments in the euro area's international cost and price competitiveness

Against the background of the strong appreciation of the euro in 2002 and in the first half of 2003, this article assesses developments in the international cost and price competitiveness of euro area firms. It discusses the merits and limitations of real exchange rates based on various cost and price deflators as measures of the euro area's international cost and price competitiveness and it introduces two new real effective exchange rate (REER) indices for the euro. The new indicators extend the set of euro REERs for the narrow group of euro area partner countries to encompass developments in relative GDP deflators and in relative unit labour costs in the total economy (ULCT). This variety of indicators facilitates a cross-checking of findings and suggests that by the second quarter of 2003, the international cost and price competitiveness of the euro area had broadly returned to the levels seen at the time of the launch of the euro and was broadly in line with historical averages. This result is robust to the use of alternative deflators, the time horizon considered and the degree of coverage of partner countries.

1 Introduction

In its four-and-a-half years of existence, the euro has experienced sizeable exchange rate fluctuations, which have had a notable impact on the international cost and price competitiveness of the euro area. The strong appreciation of the currencies of major euro area trading partners in 1999-00 – most notably the US dollar, the Japanese yen and the pound sterling – entailed a significant improvement in the position of euro area firms in terms of cost and price competitiveness. The euro depreciated by 17% in nominal effective terms against the currencies of 12 important trading partners (the so-called narrow group) between the first quarter of 1999 and the fourth quarter of 2000 (see Chart 1). After reaching a historical

trough in October 2000, the euro started to recover fairly steadily – most notably in 2002 and in the first half of 2003 – thereby reversing the earlier gains in international cost and price competitiveness. The effect of this appreciation on extra-euro area trade is assessed in more detail in Box 4 in the "Exchange rate and balance of payments developments" section of this issue.

Against this background, this article provides a detailed appraisal of developments in the international cost and price competitiveness of euro area firms, taking primarily a medium to long-term perspective. Moreover, as international cost and price competitiveness depends on the relative price of goods and not just nominal exchange rates, the article considers relative developments in domestic and foreign prices, focusing on real exchange rate trends.

A general note of caution is necessary with regard to the interpretation of movements in the real external value of a currency, as an appreciation does not automatically imply a deterioration in international competitiveness when more broadly defined. First, the price of a product is only one parameter in the decision to buy a certain good. Another important dimension of competitiveness includes developments in non-price characteristics of products, such as the quality of goods or the availability and reliability of supplementary

Chart 1

Nominal effective exchange rate of the euro

(quarterly data; index: 1999 Q1 = 100)
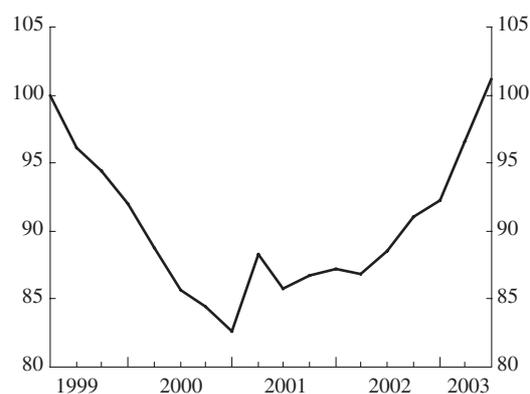
Source: ECB.

services. The analysis in Box I suggests, however, that the real exchange rate remains an important determinant of overall competitiveness. Second, the causal relationship between the economic performance of a country and its relative international price and cost position may be bi-directional. In other words, changes in the real exchange rate may reflect economic developments as well as contribute to changes in economic conditions. This discussion is connected to the relationship between economic fundamentals and the exchange rate of the euro, which was examined in the article entitled "Economic fundamentals and the exchange rate of the euro" in the January 2002 issue of the Monthly Bulletin. Third, the interpretation of indicators of international cost and price competitiveness depends on the underlying cost and price measures employed.

The merits and limitations of various real exchange rate indices for gauging developments in international cost and price competitiveness are discussed in the following section. Subsequently, developments in the euro area's cost and price competitiveness are reviewed. Overall, the analysis suggests that, compared with historical experience, the competitive position of euro area firms in international markets currently remains broadly in line with long-term average levels.

Box I

Can indicators of international cost and price competitiveness provide an important insight into overall competitiveness?

Real effective exchange rates (REERs) of the euro are commonly employed as a means of assessing the competitive position of euro area firms in international markets. It is frequently suggested that caution should be exercised when interpreting real exchange rates as indicators of international cost and price competitiveness, since the real exchange rate – as a relative price – only encompasses changes in cost and price competitiveness and fails to take into account non-price dimensions of competitiveness (such as the quality of goods and the reliability or availability of servicing networks). The potential importance of price factors for the overall competitive position of euro area firms can be reviewed by building on data from the Business and Consumer Survey Database of the European Commission (EC). The analysis of the relationship between the REER and the EC survey data indicates that there are, for the time being, no clear signs that the quality of the euro REER, as an indicator of the overall competitiveness of euro area firms in international markets, has diminished.

EC survey-based competitiveness indicator and CPI-based REER of the euro
(quarterly data; normalised data)
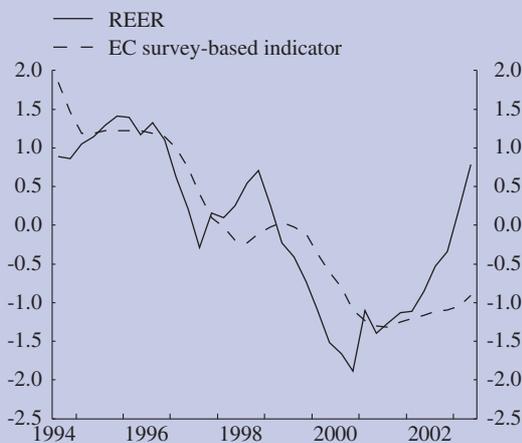
Sources: European Commission and ECB.
Note: Cumulated industry survey data from the EC Business and Consumer Survey Database are used.

The European Commission conducts a broad range of qualitative economic surveys on the economic situation in the European Union (EU). In particular, the EC Business and Consumer Survey asks more than 20,000 economic units across the euro area to assess their competitive position outside the EU in the recent past. The respondents have three options to choose from – "up" (for an improvement), "unchanged" or "down" (for a deterioration) – which are subsequently aggregated into balances (i.e. the total of the "ups" minus that of the "downs"). As this survey asks firms to judge their overall competitive position, it effectively goes beyond the more limited concept of cost and price competitiveness as reflected in the real exchange rate index.

The chart shows the CPI-based REER of the euro for the narrow group of partner countries and the EC survey-based competitiveness indicator. The data are normalised (in logarithms) to have the same mean and variance over the sample period. An increase of the indicator reflects in both cases a decline in international competitiveness. Since in the questionnaire the European Commission asks about recent changes in the competitive position, the EC survey-based series has been cumulated in order to compare it with developments in the level of the euro REER. This calls for caution to be exercised, as factors related to non-price competitiveness may be feeding into a changing perception of overall competitiveness only very gradually, and in a quarter-to-quarter assessment, non-price factors might be partly concealed by more volatile determinants of competitiveness such as movements in the nominal exchange rate. Accordingly, the establishment of a relationship between the real exchange rate and the survey data would provide an indication that cost and price competitiveness is indeed important, but it must not be interpreted as indicating that factors related to non-price competitiveness are irrelevant.

The normalised data for the real exchange rate and the EC survey-based indices exhibit some degree of co-movement. More formal tests confirm a long-term link between the two series and suggest that causality runs from the real exchange rate to the EC survey index. According to these results, in the medium term, relative prices seem to play an important role in determining and gauging the competitive position of the euro area vis-à-vis major trading partners, while in the short term, it may be disguised by other factors such as pricing strategies of firms. Consequently, the real exchange rate can serve as a useful proxy for the overall international competitiveness of euro area firms.

However, there are some statistical and technical issues which need to be kept in mind as they may impede a fully coherent comparison of the trends in the real euro exchange rate and the EC survey-based competitiveness indicator. In particular, while the EC survey refers to the international competitiveness of euro area companies vis-à-vis the countries outside the EU, the REER of the euro refers to the cost and price competitiveness of euro area firms vis-à-vis all major trading partners outside the euro area, i.e. including the EU countries outside the euro area.

2   What is the appropriate relative price concept?

The interpretation of measures of international cost and price competitiveness is complicated by the properties of available cost and price measures. An ideal indicator of international cost and price competitiveness should be computable on the basis of readily available and reliable statistical information not subject to significant revisions. In addition, it should represent (comprehensively) those sectors of the economy which are subject to international competition, whilst also taking into account the fact that their competitive position may be affected by cost and price developments in sectors producing inputs which might not be traded internationally. In any case, the longer the underlying assessment horizon, the more disputable a separation into traded and non-traded goods, because in an increasingly globalised world, international factor mobility and knowledge spillovers blur the borderline between tradables and non-tradables. In the presence of a non-traded goods sector, however, traded and non-traded goods prices may diverge over time as a result of asymmetric productivity shocks (following the well-known Balassa-Samuelson argument), which implies that REERs based on broad price indices could be misleading indicators of traded goods competitiveness. This argument, however, seems to be more relevant for emerging economies in a catching-up process than for industrialised countries.

Moreover, if international cost and price competitiveness is defined as the *ability* to sell products in foreign markets, it should not be affected by "pricing-to-market"

strategies of firms. Pricing-to-market behaviour refers to a pricing strategy whereby firms (partly) offset variations in the exchange rate by adjusting their profit margins, instead of instantly passing the movement in the exchange rate on to prices charged to foreign customers. To assess the international cost and price competitiveness of euro area firms, it thus appears more relevant to apply a measure that reflects a price at which a product could principally be offered in view of the cost structure and including a normal mark-up margin, rather than the price actually charged. In fact, the latter might partly reflect an undue short-term expansion or contraction of profit margins. Naturally, none of the indicators employed in practice can fully satisfy all above-mentioned conditions. Consequently, it seems appropriate to examine and compare a wide range of REER indicators based on various cost and price measures, such as consumer price indices (CPIs), producer price indices (PPIs), GDP deflators and unit labour costs (ULC), in order to cross-check the findings.

REER indices based on CPIs are the most widely used indicators of cost and price competitiveness, as they have two important advantages: (i) the definition of CPIs is fairly homogeneous across countries; and (ii) they are available on a timely basis and are only subject to minor revisions. From a conceptual point of view, however, CPI-based REERs have a number of potential drawbacks. First, CPIs include prices of goods imported solely for consumption purposes. At the same time, CPIs exclude prices of important tradable goods, such as capital and intermediate goods, which also enter the production process as inputs. Second, indirect taxes and subsidies may distort the interpretability of CPI-deflated REERs as competitiveness indicators. Third, CPIs contain a significant share of non-traded goods and, in particular, non-traded consumer services.

The REER based on GDP deflators has the advantage over the CPI-deflated REER of shifting the focus from the consumption to the production side of the economy, which

appears to better reflect international cost and price competitiveness considerations. However, this indicator also includes non-tradable as well as tradable goods, thereby sharing a potential conceptual shortcoming with the CPI-based index. In addition, GDP deflators are also subject to distortions owing to taxes and subsidies. By contrast with CPI-based indicators, REERs based on GDP deflators are less timely, subject to significant revisions and less comparable across countries.

REER indices based on PPIs seem to constitute a natural alternative to indices based on CPIs or GDP deflators. As with GDP deflators, the weighting scheme of the PPIs is based on the production side of the economy. PPIs also seem to better accommodate the issue of tradability. Although it may be that some goods in the PPI basket are not actually extensively traded internationally, PPI baskets do include a broad range of industrial goods and products that are subject to international competition. PPI-based REER indicators have the salient feature of encompassing goods which would potentially be traded internationally if the relative prices were more favourable, whereas indices based on export prices, for instance, would select only those products which are effectively sold at current prices on international markets. However, PPIs have the disadvantage relative to CPIs of being less comparable across countries. They also exclude services prices, which are becoming increasingly important in international trade. Finally, they share the limitation of the other price measures discussed above in that they may be subject to pricing-to-market behaviour which weakens their interpretability.

In order to avoid the adverse impact of pricing-to-market behaviour, one option could be to move from price to cost measures. Unit labour costs in manufacturing (ULCM) indices are commonly available and take better account of traded goods as they encompass the manufacturing industry. However, they are subject to bigger problems of measurement,

definition and comparability across countries. For instance, in the case of Germany this kind of indicator has shown a strong upward trend compared with all other cost and price measures. However, this rather peculiar trend appears to be due to measurement problems rather than reflecting an actual significant deterioration in Germany's international cost and price competitiveness.[1] Although the ULCM-based REER indicator for the euro area as a whole does not reveal such a trend, the German ULCM-based indicator suggests the need for a rather cautious interpretation of ULCM-based REERs. The index based on ULCT does not exhibit the same peculiar pattern for Germany as the ULCM index, meaning that this potential practical limitation of ULC-based indicators does not apply in every case. However, ULC-based REER indicators also have some other more general conceptual drawbacks. For instance, ULCs represent only a fraction of the total costs of a company, ignoring the influence of, for instance, R&D expenditure, distribution costs and capital costs. In this context, the costs of intermediate inputs, which themselves may include labour costs in the non-traded goods sector, may also be relevant. In addition to the above-mentioned shortcomings, ULC movements may reflect factor substitution without necessarily implying more cost-efficient production and a consequent gain in international competitiveness. Finally, limitations

are commonly observed: (i) in the timeliness of the publication of ULC series; (ii) in their cross-country comparability; and (iii) in terms of the frequency and magnitude of data revisions.

For the narrow group of trading partners (which comprises 12 major trading partners of the euro area), the ECB has so far compiled REER indicators on the basis of CPIs, PPIs and ULCM. In this article, the ECB introduces two additional REER indicators based on (i) ULCT and (ii) GDP deflators.[2] As is the case for the ULCM-based REER index, both new indicators are available at a quarterly frequency (with a lag of roughly one quarter), as opposed to the REER indices based on CPIs or PPIs which are available on a monthly basis. The underlying series are constructed back to 1990 for the measures based on CPIs, PPIs and ULCM, while the new indicators go back to 1991. Prior to 1999, a "synthetic" euro exchange rate has been employed in the construction of all REER indicators (for details see Box 2).

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[1] See Deutsche Bundesbank (1998), "The indicator quality of different definitions of the real external value of the Deutsche Mark", Monthly Report, November, pp. 39-52, and Deutsche Bundesbank (1995), "Overall determinants and trends in the real external value of the Deutsche Mark", Monthly Report, August, pp. 17-37.
[2] For a detailed account of the computation of the NEER and REER of the euro, see L. Buldorini, S. Makrydakis and C. Thimann (2002), "The effective exchange rates of the euro", ECB Occasional Paper No. 2.

Box 2

Sources and compilation methods of the price and cost deflators for euro REER indicators

This box provides an overview of the sources, data availability, frequency and timeliness of the relative price and cost indicators used to compile the euro REER indicators. Euro REERs are now available on the basis of five alternative price and cost indicators, namely CPIs, PPIs, ULCM, ULCT and GDP deflators. The latter two indicators are published for the first time in this issue of the Monthly Bulletin and have been included in Table 10 of the "Euro area statistics" section. In addition, some improvements have been made to the previously published indicators, e.g. by using more comparable data which have recently become available.

For all price and cost indices, harmonised European statistics – provided by Eurostat – have been used to the extent possible for the countries of the European Union, Norway and the acceding countries (most of which are included in the broad group of partner countries). Wherever these data were not available, the calculations have been based mainly on IMF and OECD databases as well as national sources. The index based on consumer price developments employs HICPs for most European countries, while the all-item national CPIs are used for all other countries. Producer prices refer to the domestic sales of the manufacturing industries for

all European countries; similar definitions are employed for all other countries. ULCM – defined as the ratio of compensation per employee to real value added per person employed in the manufacturing industry – are derived from ESA 95 national accounts sources for the euro area, the United Kingdom and Denmark. For other partner countries, they are derived from the respective national accounts sources or from different and not fully comparable indicators of wages and production in industry. ULCT – defined as the ratio of total compensation per employee in the economy to real GDP per person employed – are derived from national accounts. For some non-European countries, the coverage of the economy is only partial and depends on the available data sources (e.g. the deflator for the United States refers to ULCs in private non-agricultural business). GDP deflators are also derived from ESA 95 national accounts sources for European countries; for the other countries of the narrow group, deflators are computed using information from databases of international organisations.

In terms of data availability, CPI and PPI deflators are available on a monthly basis, while ULCM, ULCT and GDP deflators are available on a quarterly basis. Where national data are published at a lower frequency than needed, available series have been interpolated. Moreover, there are differences with regard to the timeliness of the underlying cost and price deflators. Most CPI and PPI statistics become available after a relatively short time-lag (two to five weeks) and are usually only subject to minor revisions. Accordingly, the calculation of the associated REER only requires an estimate of CPI and PPI data for the most recent month. By contrast, ULCT, ULCM and GDP deflators are released with a significant time-lag and are subject to more pronounced revisions. Owing to the lag in the publication of the underlying data, REERs based on these price and cost indices contain a more significant forecast element for the latest quarter. When the country coverage is too low as a result of insufficient timeliness of underlying deflators, the publication of these REERs, as is the case in Table 10 of the "Euro area statistics", lags behind that of the REERs based on CPI and PPI indicators.

3 Developments in euro area cost and price competitiveness

Real effective exchange rate versus the narrow group of trading partners

In spite of the previously outlined measurement difficulties, the REER indices of the euro vis-à-vis the narrow group of trading partners exhibit a high degree of co-movement (see Chart 2), suggesting that overall they provide a reasonable representation of the euro area's international cost and price competitiveness. Moreover, the NEERs and the REERs move closely together, mainly reflecting similar inflation rates in the narrow group of partner countries and the euro area.

Chart 2 shows that the REER indices fluctuated without a clear trend in the first half of the 1990s. In 1996-97, euro area firms experienced a significant improvement in their international cost and price competitiveness as a result of the strong appreciation of the partner countries' currencies vis-à-vis the euro legacy currencies. This trend was temporarily reversed in 1998

Chart 2

Real effective exchange rates of the euro based on different deflators [1]

(quarterly data; index: average (1991 Q1 - 2003 Q2) = 100)

REER CPI
REER PPI
REER GDP
REER ULCM
REER ULCT
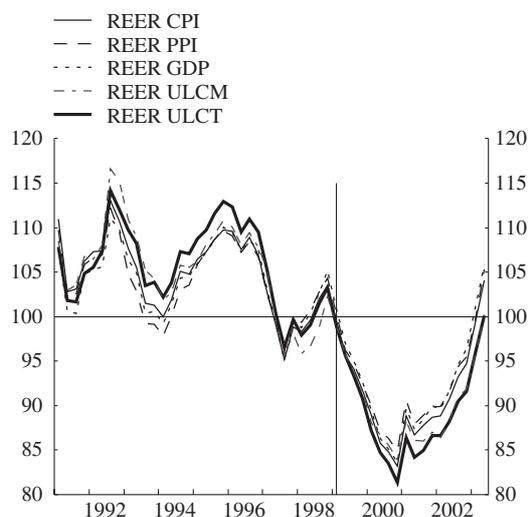
Source: ECB.
1) *An upward movement of the index represents an appreciation of the euro. The latest observations for REERs based on ULCM, ULCT, and GDP deflators are estimates.*

owing to a recovery of the legacy currencies, but resumed in 1999-00 when the euro came under strong downward pressure. Since the end of 2000, the downward movement observed in 1999-00 has been completely reversed. Compared with the 1990s, the current competitive position of euro area firms remains well within historical ranges despite the strong appreciation of the euro in 2002 and in the first half of 2003. Specifically, in the second quarter of 2003, all indices stood fairly close to their average levels over the periods for which they are available. The main finding that the cost and price competitiveness of euro area firms is within historical ranges can be examined in more detail by considering an extension of the country coverage or an extension of the time horizon.

Extending the country coverage

The real exchange rate indicator based on a broader set of partner countries is useful to ascertain whether the change in the euro
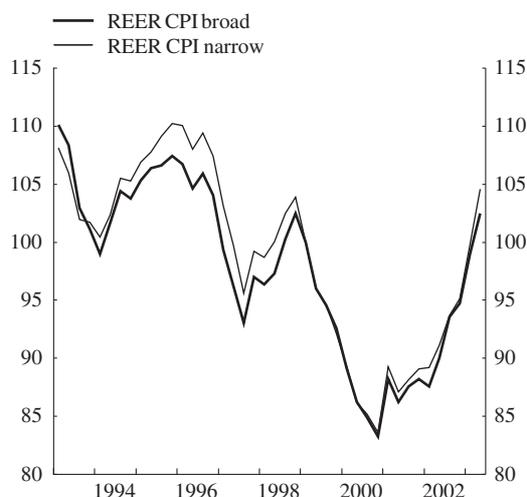
Chart 4

Historical real effective exchange rate of the euro [1]

(quarterly data; index: 1999 Q1 = 100)
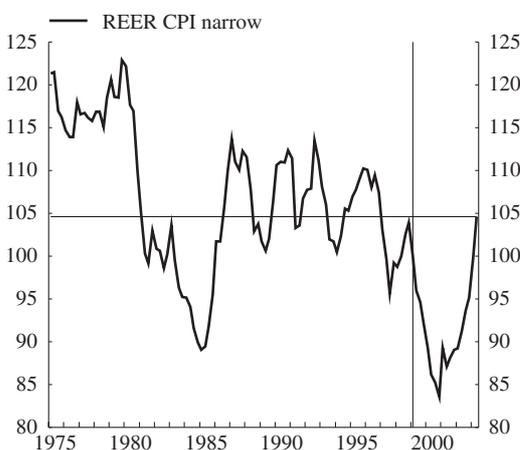
Source: ECB.
1) An upward movement of the index represents an appreciation of the euro. The horizontal line indicates the average since 1975.

area's international cost and price competitiveness vis-à-vis the narrow group of partner countries has been amplified or offset by a change in cost and price competitiveness against other trading partners (particularly emerging market economies). This comparison allows for further verification of the overall conclusions drawn from the analysis presented above. Owing to data limitations, the broad index is only available in CPI terms as of 1993. It includes 26 emerging economies in addition to the industrialised countries (including Hong Kong, South Korea and Singapore) covered in the narrow index. In the broad index, the weight of the additional countries amounts to slightly more than 30%, while the narrow group covers the remaining 70% of euro area trade. Given the way in which the series are constructed, a rather high degree of co-movement could be expected, but the actual degree of correlation is surprisingly high (see Chart 3), particularly if the sometimes erratic movements of the currencies of emerging markets, which are subject to episodes of exchange rate turbulence, are considered.

Extending the time horizon

To assess developments over a longer time horizon, the REER indicator based on consumer price developments has been backcast to 1975 (see Chart 4), using a method consistent with the officially published ECB series. Given the high correlation among the indicators in the 1990s, this should be an acceptable proxy for developments in the euro area's international cost and price competitiveness over the past 28 years. Compared with the mid-1980s, when the US dollar was widely perceived to be overvalued, euro area firms were actually more (price) competitive at the end of 2000. The subsequent appreciation of the euro naturally resulted in a deterioration of the euro area firms' competitive position in international markets. However, in the second quarter of 2003, the euro area's cost and price competitiveness stood close to its average over the past 28 years (shown by the horizontal line in Chart 4).

4   Conclusions

This article has examined developments in the euro area's international cost and price competitiveness in the light of the broad-based appreciation of the euro exchange rate in 2002 and in the first half of 2003 following the strong depreciation of the euro in 1999-00. It has shown that, by the second quarter of 2003 all measures of the international cost and price competitiveness of euro area firms had returned to the levels seen at the time of the launch of the euro. Using longer-term averages as a rough benchmark for assessing current levels of the euro's REER, euro area cost and price competitiveness is found to now be broadly consistent with its historical averages. This finding is robust to the use of various deflators, the time horizon considered and the degree of coverage of partner countries.

Moreover, two new measures of the REER of the euro – based on ULCT and GDP deflators – were introduced. Since none of the employed REER indicators satisfy all the conditions which characterise an ideal indicator of international cost and price competitiveness, a more pragmatic approach was taken by comparing five different real exchange rate measures as a means of cross-checking the findings. Indeed, the euro REER indices vis-à-vis the narrow group of trading partners exhibit a very high degree of co-movement, suggesting that overall they provide a reasonable picture of the euro area's international cost and price competitiveness.