Inflation differentials in the euro area : size, causes, economic policy implications and relative position of Belgium

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Introduction

The creation of the Economic and Monetary Union was a milestone in the European construction and integration. On 1 January 1999, eleven countries – followed a year later by Greece – voluntarily opted to introduce a common currency, the euro, and thus to relinquish their monetary autonomy. Since then, the European Central Bank has been in charge of monetary policy for the euro area, and in accordance with the Maastricht Treaty, its primary objective is to maintain price stability in the EMU. The ECB Governing Council has defined price stability as an annual rise in the harmonised index of consumer prices (HICP) for the euro area below, but close to, 2 p.c.
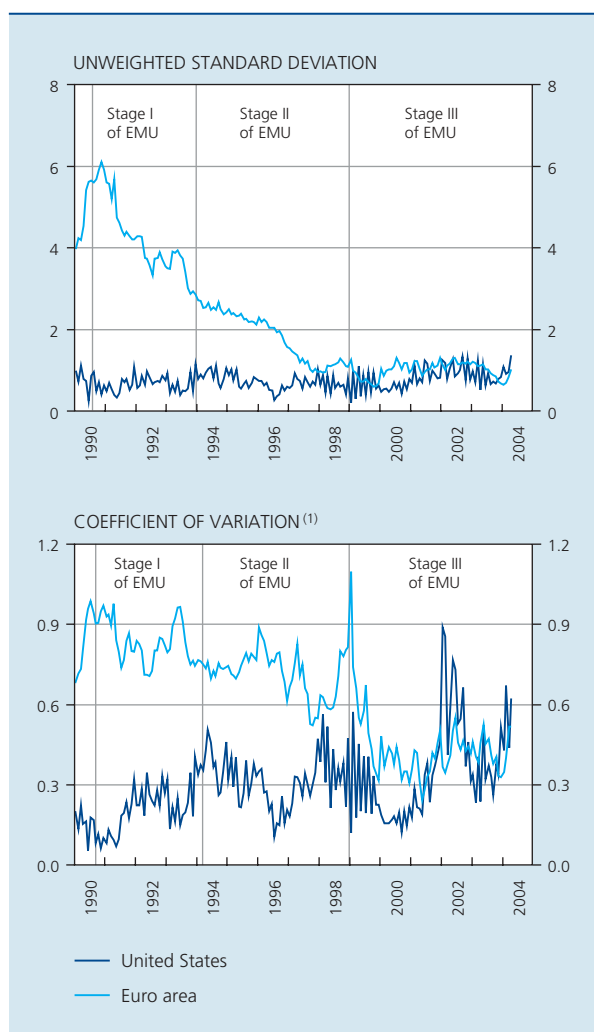
Since the beginning of the nineties, the level of inflation in all EMU countries has fallen significantly, and the inflation rates have also converged to a considerable extent. The (unweighted) standard deviation of the HICP, which stood at 4 percentage points in the early nineties, gradually declined to 1 percentage point at the time of introduction of the single currency. Yet the past few years have seen a slight increase in inflation differentials within the euro area. The differences are still comparable to those observed in the United States in terms of size, although there are clearly some divergences in their nature. In some European countries, there have been persistent differentials in one particular direction. Thus, for the period 1999-2004 there were two distinct groups : on the one hand, countries such as Germany, France and Austria where the

level of inflation was consistently below the EU average, and on the other hand, countries such as Greece, Spain, Ireland and Portugal where inflation systematically outpaced the average for the euro area. The situation in the Netherlands, where inflation was running well above the level for the euro area from 2000 to the end of the second quarter of 2003, but has since remained below the average – shows that although those differences are fairly persistent they are not permanent. Belgium, Luxembourg and Finland appear to be an exception, since inflation there is close to the average for the euro area.

There has been a considerable amount of research[1] focusing on the reasons for such trends and their implications. It should be pointed out that the Eurosystem has no instruments at all which it can use to control these inflation differentials, because under the Treaty the Eurosystem only takes account of the HICP for the euro area. It is therefore up to the Member States with inflation deviating from the EMU average to identify the undesirable inflation differentials and take appropriate measures to ensure their reduction and to limit the impact on their competitiveness.

[1] See for example ECB (2003), "Inflation Differentials in the Euro Area : Potential Causes and Policy Implications".

CHART 1   INFLATION DISPERSION IN THE UNITED STATES
AND THE EURO AREA

(percentage points)

UNWEIGHTED STANDARD DEVIATION

Stage I
of EMU

Stage II
of EMU

Stage III
of EMU

COEFFICIENT OF VARIATION [1]

Stage I
of EMU

Stage II
of EMU

Stage III
of EMU

— United States

— Euro area

Sources : BLS, EC, NBB.
(1) The coefficient of variation is defined as the ratio between the unweighted standard deviation and the average.

Nevertheless, following its evaluation of the monetary policy strategy the ECB Governing Council did clarify the definition of price stability, in order, inter alia, to take account of the persistent inflation differentials which have been observed since the beginning of Stage Three of EMU. That clarification of the Eurosystem's monetary policy strategy was also intended to avert any risk of deflation in the euro area and to take account of any measurement errors caused, for example, by the quality bias in the HICP. Before 8 May 2003, no signal had ever been given if inflation remained below the 2 p.c. threshold. Now, the monetary authorities have specified that the inflation rate needs to remain close to that threshold, thus creating a safety margin against deflation in

the euro area in general, and making it possible for the various countries to show negative and even persistent inflation differentials without that leading to any absolute fall in the general price level in the countries concerned.

It is essential to determine the factors underlying these differentials, since the Member States – now that they have relinquished their monetary sovereignty – can no longer adjust their monetary policy to correct the national imbalances resulting, for instance, from asymmetric shocks. In that situation, the mobility of the production factors and the relative flexibility of prices and wages between the Member States will play a crucial role in restoring equilibrium. In some cases, the inflation differentials are therefore nothing else than the mechanism for effecting the adjustment.

However, in the event of price or wage rigidity, restoring equilibrium may take rather a long time and entail considerable costs. Moreover, the process is hampered by the fact that the inflation differentials trigger two separate mechanisms, only one of which acting as a stabiliser. If, as a result of an asymmetric shock, a country experiences a boom (slump), then the recovery of the equilibrium can only take the form of positive (negative) inflation differentials in so far as the pro-cyclical effect on the real interest rate is offset by the anti-cyclical effect on the real exchange rate. As the nominal interest rate has been the same for all participants since the start of Stage Three of EMU, a positive inflation differential in the country in question in fact causes the real interest rate to fall. That fall may in turn stimulate demand and push up the general price level, so that the divergent position in the cycle and the inflation differential could also become more persistent. The second mechanism works via the real exchange rate, taking the form of a change in relative prices. This mechanism, which generally operates more slowly, will eventually outweigh the impact of the first mechanism, since a positive inflation differential causes a loss of competitiveness and, therefore, a gradual fall in both demand and inflation.

On the basis of the origin of the inflation differentials, the economic policy makers of the Member States can therefore judge whether it is desirable to apply economic policy instruments in order to speed up the reduction in those differentials, either via an appropriate fiscal policy or via a structural policy aimed at improving the flexibility of the labour market and of the goods and services markets and thus reinforcing the self-correcting mechanisms. An inappropriate national economic policy, such as a strongly pro-cyclical fiscal policy, may of course be a reason underlying the inflation differentials.

Furthermore, inflation differentials may reflect a process whereby an economy is "catching up". The theoretical explanation is based on the "Balassa-Samuelson" effect whereby – provided certain assumptions are fulfilled – differences in relative productivity between tradable and non-tradable goods lead to real appreciation and positive inflation differentials. In principle, these differentials are not associated with any loss of competitiveness since real convergence is taking place. In view of the characteristics of the inflation differentials in the euro area – particularly their persistence – a great deal of research has been conducted on this factor[1]. This effect appears to explain inflation differentials in some countries up to a certain point. According to the ECB (2003b), the theory is applicable in part to Greece, Ireland and Portugal, and to a lesser extent to Spain, in other words economies with relatively high inflation levels. The relatively low inflation rate in Germany is apparently also attributable to some extent to the "Balassa-Samuelson" effect. However, the results of all these studies need to be interpreted with caution, as the estimates are not very accurate and the basic hypotheses underlying the "Balassa-Samuelson" effect do not always seem to hold true.

This article focuses on Belgium and more particularly on the paradox apparent from the research conducted so far into the "Balassa-Samuelson" effect. Recent studies have shown that the "Balassa-Samuelson" effect is a major factor in Belgium, implying that the inflation rate should be higher, in trend terms, than the average in the euro area. Those results are at odds with the fact that, on the basis of the harmonised index of consumer prices (HICP), the main indicator of European monetary policy, inflation differentials are currently nearly non-existent in Belgium, and that in the past the Belgian franc never showed any tendency to appreciate in real terms (against the German mark).

This article is structured as follows. The first section comprises a brief outline of the Belgian situation as regards inflation differentials, based on earlier analyses. After that, special attention is paid to the existence of a possible "Balassa-Samuelson" effect in Belgium. The final section presents the conclusions.

1. Overview of Belgium's relative position

Since the second half of the seventies, inflation in Belgium has been below the average for the euro area. These systematic negative inflation differentials are largely attributable to the fact that, throughout that period, Belgium's monetary policy was geared more closely to price stability than was the case on average in the other countries belonging to the monetary union. This was because the Belgian monetary authorities were trying to keep the Belgian franc stable against the German mark and achieve price stability in line with the example set by Germany.

However, at the beginning of the period, wage fixing and fiscal policy were not sufficiently compatible with such an ambitious monetary policy, so that during the second half of the seventies and the first half of the eighties persistent positive inflation differentials were recorded in relation to Germany. Those differentials necessitated adjustments to the parity against the German mark, e.g. the devaluation of the franc in 1982. However, that devaluation was accompanied by a number of supporting measures, particularly in regard to wage fixing, so that it initiated a radical turnaround which was then further reinforced when a start was made on restoring sound public finances.

CHART 2   INFLATION IN BELGIUM, GERMANY AND THE EURO AREA : LONG-TERM TREND

(percentage changes compared to the previous year)
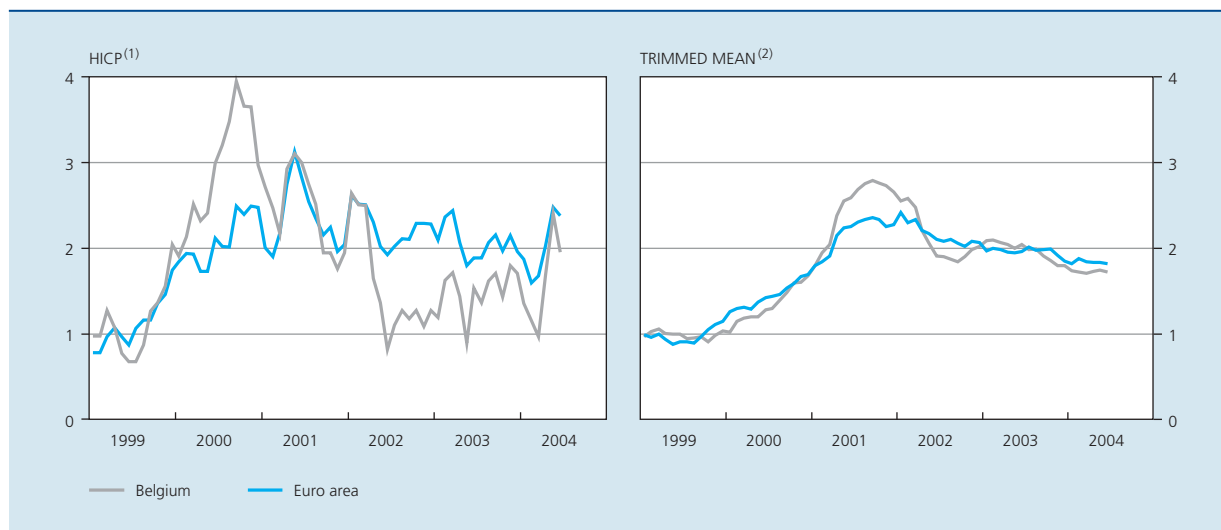

Belgium
Euro area
Germany
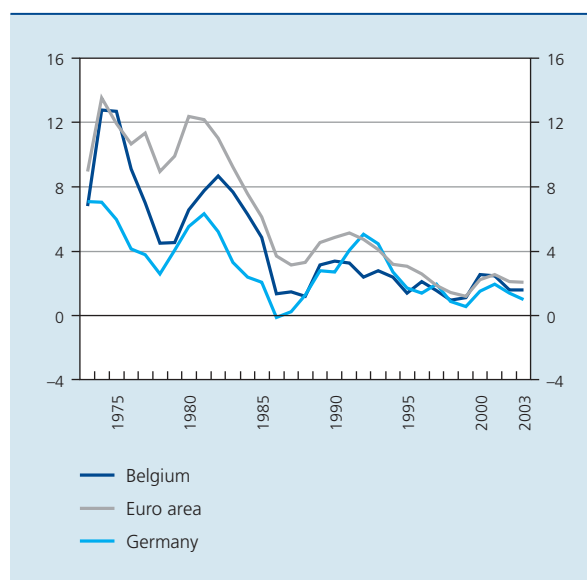
Sources : OECD, NBB.

[1] See for example Alberola-Ila and Tyrväinen (1998), De Grauwe and Skudelny (2000) and Canzoneri et al. (2001).

CHART 3   INFLATION IN BELGIUM AND IN THE EURO AREA

(percentage changes compared to the corresponding month of the previous year)

HICP[1]

TRIMMED MEAN[2]

Belgium   Euro area

Sources : ECB, NBB.
(1) Excluding the estimated effect, in January and July 2000, of the inclusion of the prices discounted in the sales in the Belgian HICP from 2000 onwards.
(2) Measured by the components of the HICP, according to the JB-Monthly estimator, explained in Aucremanne L. (2000), *The use of robust estimators as measures of core inflation*, National Bank of Belgium Working Papers – Research Series, No. 2 (March).

After 1987, the Belgian franc was not devalued again in relation to the German mark, and in June 1990 it was pegged more specifically and explicitly to the mark. Since then, the inflation differential between Belgium and Germany has ceased to be systematically positive, and that differential has tended to be more a reflection of the differences in the position of the two economies in the business cycle. For example, at the beginning of the 1990s the inflation differential between the Belgian and German economies was negative, and reflected the overheating of the German economy at the time of reunification. However, in the past few years the opposite has happened, and there has been a positive inflation differential, which is partly an indication of Germany's relatively weak economic situation.

For the euro area as a whole, the convergence of inflation towards a level compatible with price stability only took place at a later stage, namely during the two years preceding the monetary union.

Since the introduction of the single currency, inflation in Belgium has not shown a persistent deviation from the average for the euro area; in certain periods it has exceeded that average, while in others it has remained below it.

The Bank[1] has conducted various studies examining the Belgian situation, analysing certain factors which may cause those inflation differentials. According to that research, inflation in Belgium presents hardly any structural or cyclical characteristics which differ from those in the euro area. The only apparent exception is the short-term sensitivity of inflation to fluctuations in the oil price. This factor is a source of very short-lived inflation differentials with no systematic upward or downward deviation. It seems that the short-term elasticity of consumption prices to changes in the oil price is greater in Belgium than in the euro area. That difference is largely attributable to the relatively lower excise duty on petrol, diesel and heating oil, and to the greater weight of those products in the consumer price index.

However, since April 2002 a negative inflation differential has been recorded which is due primarily to administrative measures by the government[2], while similar factors – mainly an increase in indirect taxes – have instead caused inflation to increase in the euro area. The underlying trend in inflation in Belgium, measured by the "trimmed mean" method, which enables extreme price changes to be disregarded, does not deviate from the trend observed during the latest business cycle in the euro area.

(1) See for example NBB (2003) and NBB (2004).
(2) The main factor curbing inflation was the abolition of the television and radio licence fee in Flanders and Brussels, and the reduction in that fee in Wallonia.

Earlier research on the above factors has shown that the inflation differentials between Belgium and the euro area are only very short-lived and that they have no upward or downward bias. Nonetheless, some studies of the "Balassa-Samuelson" effect conclude that Belgium should be an economy with a relatively high inflation rate.

2. The relevance of the "Balassa-Samuelson" effect for Belgium

This effect, described by Balassa and Samuelson in 1964, refers to the mechanism whereby, in countries whose economies are in the process of catching up, the real exchange rate appreciates, in general, as a result of the increase in the relative productivity of tradable as opposed to non-tradable goods.

Relative productivity and real exchange rate

The "Balassa-Samuelson" theory splits the economy into two sectors. The tradable goods sector corresponds to the sector exposed to international competition. It consists mainly of industry and is generally capital-intensive. It is assumed that prices in this sector are determined by demand and supply at world level. In contrast, the second sector – non-tradable goods – is not subject to international competition and comprises mainly services. It is less capital-intensive. The "Balassa-Samuelson" effect predicts that in an economy which is catching up, the difference in relative productivity of the tradable goods sector as opposed to the non-tradable goods sector will be growing because the first sector attains productivity gains more quickly. This increase in labour productivity is usually due to increased capital accumulation.

In the tradable goods sector, these productivity gains lead to a rise in real wages. Assuming perfect mobility of labour within an economy, wages in the non-tradable goods sector follow a similar pattern. The increase in the cost of labour then has a greater impact on prices in the latter sector since the productivity gains are smaller. The movement in relative prices in one sector as opposed to the other therefore fully reflects the increase in relative productivity, which is more marked in the countries which are catching up than in the developed countries. Moreover, if purchasing power parity is maintained in the tradable goods sector, these developments in regard to relative productivity (or relative prices) lead to real appreciation for the country which is catching up. On the basis of a real exchange rate model which is relatively general, the box provides a detailed explanation of the underlying hypotheses of the "Balassa-Samuelson" effect, namely not just the respect of purchasing power parity for the tradable goods but also a situation of perfect competition (absence of any mark-up) and equalisation of wages between the two sectors of the economy. Research on whether these hypotheses are correct is crucial for determining whether a "Balassa-Samuelson" effect applies in Belgium.

In a monetary union with a fixed nominal exchange rate, real exchange rate changes take the form of inflation differentials. According to the "Balassa-Samuelson" effect, there would in that case have to be a positive inflation differential in countries where the rise in relative productivity is most pronounced. This question is often presented in the form of the "equilibrium inflation rate". That concept adjusts for each Member State the target inflation rate set by the monetary authorities for the union as a whole, on the basis of differences between the countries in relative productivity (or relative prices).

The studies conducted so far have produced fairly surprising results, in that the Belgian economy ought to have a relatively high equilibrium inflation rate. In contrast, Germany is systematically presented as a country where the equilibrium inflation rate would be well below the average.

These results are due to the fact that these studies systematically showed that there was a marked increase in relative productivity in Belgium, while in Germany the increase was more modest, and also to the fact that the movement in relative prices – measured by the value added deflator – closely follows the movement in relative productivity. Although the equilibrium inflation rate in some analyses is calculated on the basis of productivity differentials, while other studies are based on the differences in relative prices, they all assume the respect of purchasing power parity for tradable goods even though that assumption could often be refuted empirically.

This article proceeds to apply these theoretical concepts to Belgium. The conclusions are then compared with the results already published in the literature. In the absence of sufficiently long time series for EMU as a whole, the analysis is confined to the real exchange rate between Belgium and Germany, the largest euro area country in terms of GDP. Moreover, choosing Germany guarantees a degree of coherence with earlier studies in which that country also acted as the reference economy. The analysis was initially based on the value added deflator, as in most other studies, but the "Balassa-Samuelson" effect is also studied on the basis of the consumer price index, the inflation yardstick which the monetary authorities use as a guide for their decisions.

Sample	Alberola-Ila and Tyrväinen (1998)	Canzoneri and al. (2001)	De Grauwe and Skudelny (2000)	Sinn and Reuter (2001)	Average of the studies	Standard deviation
	1975-1995	1973-1997	1970-1995	1987-1995		
Euro area	2.0	2.0	2.0	2.0	2.0	0.0
Germany	1.3	1.0	1.7	1.0	1.2	0.3
Austria	1.8	1.8	2.5	2.4	2.1	0.4
Belgium	**3.1**	**2.6**	**2.1**	**1.8**	**2.4**	**0.6**
Spain	2.1	2.4	2.0	2.5	2.2	0.2
France	1.7	2.4	1.6	2.3	2.0	0.4
Greece	–	–	–	5.3	5.3	–
Finland	2.4	2.4	1.4	3.7	2.4	0.9
Italy	2.4	2.8	2.4	2.5	2.5	0.2
Ireland	–	–	–	3.4	3.4	–
Netherlands	2.3	–	2.0	2.4	2.2	0.2
Portugal	–	–	2.1	1.8	1.9	0.2

Sources : ECB, NBB.

Box – Real exchange rate model

The real exchange rate of an economy is defined as the ratio between the general level of prices in the national economy and the general level of foreign prices, expressed in a common currency. In logarithmic form, the real exchange rate of the economy (q) and that of the sector exposed to international competition (q_T), is defined as follows:

$$q = p – p^* + e \tag{1}$$
$$q_T = p_T – p^*_T + e \tag{2}$$

where e, p (p_T) and p^* (p^*_T) respectively indicate the logarithm of the nominal exchange rate (defined as the value of the national currency in a foreign currency), the logarithm of the price index of the home country (in the tradable goods sector) and that of the foreign country.

The general price level can be expressed as a weighted geometrical mean of the prices in the two sectors. As a logarithm:

$$p = \gamma p_{NT} + (1 – \gamma)\, p_T \tag{3}$$
$$p^* = \gamma^* p^*_{NT} + (1 – \gamma^*)\, p^*_T \tag{4}$$

where p_{NT} stands for the logarithm of the prices in the non-tradable goods sector and γ stands for the nominal share of that sector in the economy as a whole.

▶

By substituting equations (3) and (4) in equation (1), we obtain:

$$q = p - p^* + e = p_T - p^*_T + e + [\gamma(p_{NT} - p_T) - \gamma^*(p^*_{NT} - p^*_T)] \tag{5}$$

The first term on the right-hand side of equation (5) stands for the real exchange rate of the sector exposed to international competition. The second term of the same equation represents the weighted difference in the relative prices.

If the firms are operating under imperfect competition, the price on the goods and services market comprises a mark-up on top of the wages per unit of output, i.e. the ratio between wages per person and productivity per person[1]. As a logarithm:

$$p = \mu + w - p^m \tag{6}$$

where μ, w and p^m are respectively the logarithms of the mark-up, of wages per person and of productivity per person.

By substituting this new equation in expression (5), we obtain:

$$\begin{aligned} q = p - p^* + e = p_T - p^*_T + e &+ [\gamma\,(\mu_{NT} - \mu_T) - \gamma^*\,(\mu^*_{NT} - \mu^*_T)] \\ &+ [\gamma\,(w_{NT} - w_T) - \gamma^*\,(w^*_{NT} - w^*_T)] + [\gamma\,(p_T^m - p_{NT}^m) - \gamma^*\,(p^*{}_T^m - p^*{}_{NT}^m)] \end{aligned} \tag{7}$$

Consequently, the "Balassa-Samuelson" effect appears in pure form if the assumptions of purchasing power parity in the tradable goods sector ($q_T = 0$), perfect competition (absence of any mark-up) and wage convergence between the sectors within the economy ($w_{NT} = w_T$) hold true. In these circumstances, only the difference in productivity between the two sectors will influence the real exchange rate of the economy. It is also important to establish the link with inflation differentials. For that purpose, the variables have to be expressed in the form of growth rates.

$$\begin{aligned} \Delta q = \Delta(p - p^* + e) = \Delta(p_T - p^*_T + e) &+ \Delta\,[\gamma\,(\mu_{NT} - \mu_T) - \gamma^*\,(\mu^*_{NT} - \mu^*_T)] \\ &+ \Delta\,[\gamma\,(w_{NT} - w_T) - \gamma^*\,(w^*_{NT} - w^*_T)] + \Delta\,[\gamma\,(p_T^m - p_{NT}^m) - \gamma^*\,(p^*{}_T^m - p^*{}_{NT}^m)] \end{aligned} \tag{8}$$

In a system of fixed nominal exchange rates ($\Delta e = 0$), such as that applied in the euro area since 1 January 1999, the growth rate of the real exchange rate is equal to the inflation differential.
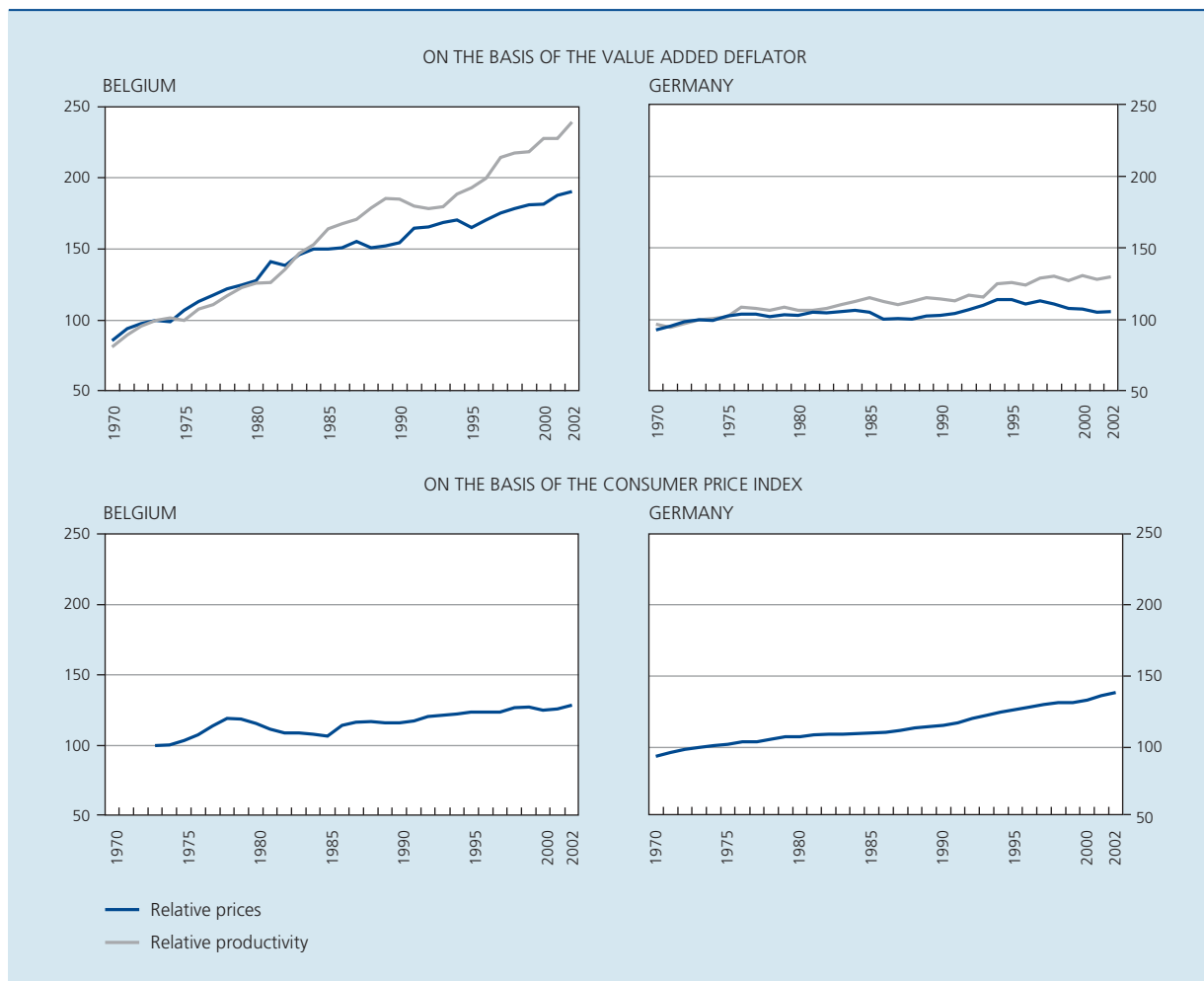
$$\begin{aligned} \Delta q = \pi - \pi^* = \pi_T - \pi_T^* &+ \Delta\,[\gamma\,(\mu_{NT} - \mu_T) - \gamma^*\,(\mu^*_{NT} - \mu^*_T)] \\ &+ \Delta\,[\gamma\,(w_{NT} - w_T) - \gamma^*\,(w^*_{NT} - w^*_T)] + \Delta\,[\gamma\,(p_T^m - p_{NT}^m) - \gamma^*\,(p^*{}_T^m - p^*{}_{NT}^m)] \end{aligned} \tag{9}$$

The symbols π and π_T respectively stand for inflation in the economy as a whole and inflation in the tradable goods sector.

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(1) Since marginal wages and marginal productivity cannot be observed, they are estimated here on the basis of average wages and average productivity respectively.

CHART 4

RELATIVE PRODUCTIVITY [1] AND RELATIVE PRICES [2] OF TRADABLE AND NON-TRADABLE GOODS

(index 1973 = 100)

ON THE BASIS OF THE VALUE ADDED DEFLATOR

BELGIUM

GERMANY

ON THE BASIS OF THE CONSUMER PRICE INDEX

BELGIUM

GERMANY

—— Relative prices

—— Relative productivity

Sources : Bundesbank, Datastream, NBB.
(1) Relative productivity is defined as the ratio between productivity in the tradable goods sector and that in the non-tradable goods sector.
(2) Relative prices are defined as the ratio between prices of non-tradable goods and prices of tradable goods.

Real exchange rate between Belgium and Germany on the basis of the value added deflator

The national accounts data on value added provide an indication of the movement in relative productivity between the sectors which are exposed to international competition [1] and those which are not [2]. Throughout the period 1970 – 2002, productivity per worker in Belgium [3] was increasing faster in the first sector, on an almost continuous basis. The trend growth of relative productivity was therefore substantial, rising faster in Belgium than in Germany. These developments were largely reflected in comparable movements – albeit in the opposite direction – in relative prices : the trend increase in relative prices measured on the basis of the value added deflator for non-tradable goods as opposed

to tradable goods was much higher in Belgium than in Germany.

(1) For the purposes of this article, the sector exposed to international competition consists mainly of industry. The analysis takes no account of the agricultural sector as its products are to a large extent subsidised by the European Community so that prices are not dictated by supply and demand at world level. The analysis also disregards the extractive industries because of their very minor significance in the two economies examined.

(2) The sector not exposed to international competition consists of all services as defined by the OECD. It comprises the rest of the economy excluding the building sector and the gas and electricity sector. Those sectors are often under debate because they contain both elements of the tradable and non-tradable products. They are therefore not included in the study.

(3) Productivity per worker is obtained by taking the value added at constant prices and dividing it by total employment. Wages are calculated in the same way, namely by dividing total pay by total employment. The use of this measure thus implies that the wage level per person is reduced by the complement of the share of employees – i.e. the part of the self-employed workers in overall employment – whereas that complement has an upward effect on the level of the mark-up. Insofar as the variation of the share of employees over time is but slight, this distortion would have but a limited impact on the development of the wages per person and the mark-up.

Although these developments appear to be largely compatible with some of the underlying assumptions of the "Balassa-Samuelson" theory and apparently tally with the results of earlier studies, the correlation observed between relative productivity and relative prices is not perfect. This implies that the other price determinants explained in the box, namely wages and the mark-up, have played a role to some extent. For instance, in Germany, in the sector protected from competition, wages increased more slowly than in the sector exposed to competition, curbing the increase in the relative prices. During the period considered, the movement in relative prices was also influenced to some extent by the mark-up, particularly in Belgium, where it declined significantly for non-tradable goods. Even though this indicates that not all the fundamental conditions of the "Balassa-Samuelson" theory are satisfied, the existence of a significant positive "Balassa-Samuelson" effect in Belgium cannot be ruled out, because despite everything the movement in relative prices was far more pronounced there than in Germany.

CHART 5   REAL EXCHANGE RATE BETWEEN BELGIUM AND GERMANY ON THE BASIS OF THE VALUE ADDED DEFLATOR

(percentage point deviation from the average for the period examined)

- Real exchange rate of the economy
- Weighted relative price differential [1]
- Real exchange rate of the exposed sector
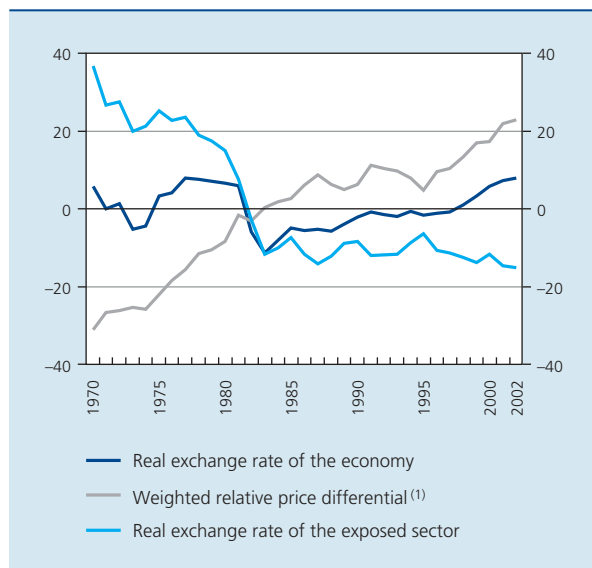
Sources : IMF, OECD, NBB.
(1) Relative prices are defined as the ratio between prices of non-tradable goods and prices of tradable goods.

However, the rest of this analysis does not confirm the conclusions formulated in earlier studies on the difference in the equilibrium inflation rate. During the period considered, there was not in fact any trend towards real appreciation in relation to Germany. Instead, the real exchange rate of the Belgian economy remained rather stationary.

This paradox is clearly connected with the fact that another – essential – assumption underlying the theory of the "Balassa-Samuelson" effect does not hold true, namely the purchasing power parity for tradable goods. An unequivocal correlation between the real exchange rate (or the inflation differentials) and the relative price differentials is in fact possible only if there is purchasing power parity in the sector exposed to competition. The studies conducted so far assume that this condition is satisfied; however, a simple graphic analysis shows that, on the basis of the value added deflator of tradable goods, purchasing power parity does not appear to exist between Belgium and Germany. The real exchange rate of the sector exposed to competition depreciated very sharply, especially in the seventies and up to the mid eighties. An econometric analysis designed to check whether time series are stationary confirms that finding.

This absence of purchasing power parity means that the link between the inflation differentials and the relative productivity differentials (or relative price differentials) is not one-to-one and that the real exchange rate of the sector exposed to competition may therefore also influence inflation differentials between Belgium and Germany. During the period examined, the real exchange rate of that sector did in fact make a largely negative contribution to the movement in the real exchange rate of the economy as a whole, and thus compensated for the effect of the positive relative price differential.

Real exchange rate between Belgium and Germany on the basis of the consumer price index

All the studies considered rely mainly on the value added deflator as the price index, because this index can be broken down into various elements permitting the "Balassa-Samuelson" effect to be explicitly demonstrated. However, it is important to take account of the consumer price index as well, since that index serves as a benchmark for the European monetary authorities. It is paradoxical that the lessons drawn from an analysis based on the consumer price index differ somewhat from the findings based on the value added deflator. That contrast is found not only at the level of relative prices, but also in the real exchange rate in the tradable goods sector.

CHART 6 REAL EXCHANGE RATE BETWEEN BELGIUM AND GERMANY ON THE BASIS OF THE CONSUMER PRICE INDEX

(percentage point deviation from the average for the period considered)

— Real exchange rate of the economy
— Weighted relative price differential [1]
— Real exchange rate of the exposed sector
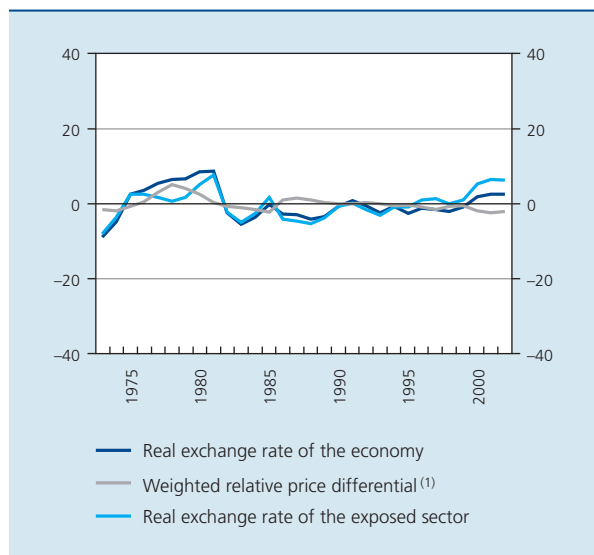
Sources : Bundesbank, IMF, OECD, NBB.
(1) Relative prices are defined as the ratio between prices of non-tradable goods and prices of tradable goods.

The trend increase in relative prices in the non-tradable goods sector [1] in relation to the tradable goods sector [2] is much lower in Belgium if the consumer price index is used to measure prices, rather than the value added deflator. Also, that increase is far more comparable in size to the increase in Germany where the use of the other source of information has less effect. Consequently, the effect of the weighted relative price differential, which does not produce any trend pattern, is very small. On the basis of these findings, there therefore seems to be little scope for any (upwards) "Balassa-Samuelson" effect characterising the movement in the real exchange rate between Belgium and Germany.

The picture presented by the real exchange rate of the sector exposed to competition – measured on the basis of the CPI – also differs from that shown on the basis of the value added deflator. That macroeconomic variable exhibits some stability – which is confirmed by an econometric test of stationarity – which means that, measured on the basis of the consumer price index, there appears to be purchasing power parity between Belgium and Germany for tradable goods.

The fact that the real exchange rate of the sector exposed to competition remains stationary, and that the same applies to the weighted difference in relative prices during the period considered, implies that the real exchange rate of the economy as a whole also remains stationary. Although that stability is due to the stationary behaviour of the components of the real exchange rate – in contrast to what is obtained on the basis of the value added deflator – nonetheless, this last conclusion endorses the results of the analysis on the basis of the value added deflator. In all, for the economy as a whole, no real appreciation in relation to Germany was recorded during the period considered; this seems to refute the existence of a "Balassa-Samuelson" effect and hence an equilibrium inflation rate over 2 p.c. in Belgium's case.

Summary of the results for the "Balassa-Samuelson" effect and tentative explanation of the paradox for Belgium

The fact that relative productivity between tradable and non-tradable goods rose much faster in Belgium than in Germany does not appear to give rise to a high equilibrium inflation rate. Of all the implications of the "Balassa-Samuelson" theory, only the link between the relative productivity and the relative movement in the value added deflator have been empirically confirmed. In the non-tradable goods sector, the value added deflator does in fact increase much faster than in the tradable goods sector, and that phenomenon is also far more marked in Belgium than in Germany. However, the contribution of relative mark-ups and relative wages is not equal to zero, as in the "Balassa-Samuelson" theory; but, those factors largely cancel one another out.

The movement in relative productivity and relative prices, measured by the value added deflator, nevertheless does not imply that the real exchange rate in relation to Germany showed a trend increase during the period considered. That is because a crucial assumption underlying the "Balassa-Samuelson" theory, namely the purchasing power parity in the sector exposed to international competition, does not hold true. The real exchange rate of the tradable goods sector depreciated sharply during the period considered, offsetting the effect of the positive productivity differential.

(1) The HICP for services was used as an approximation for the prices of non-tradable goods.
(2) The HICP for non-energy industrial goods was used as an approximation for the prices of tradable goods.

CHART 7   SUMMARY OF THE RESULTS
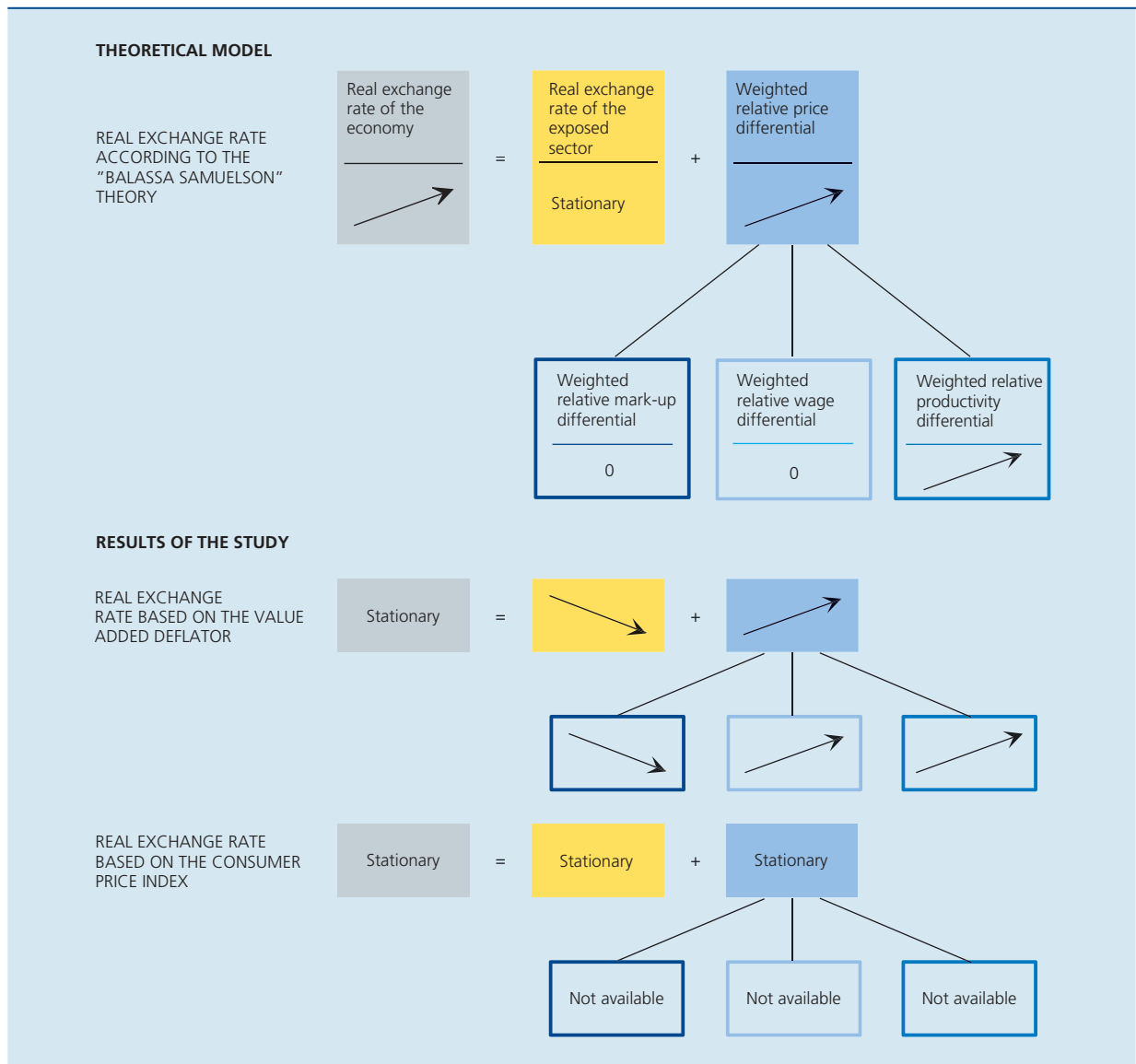
The analysis reveals that this phenomenon is attributable largely to the moderate movement in the value added deflator in the sector exposed to international competition in Belgium, justifying rejection of the purchasing power parity. In comparison with Germany, but also in relation to the consumer price index for non-energy industrial goods, that deflator increased only slightly. This seems to be due to the characteristics of Belgium's production structure. While the Belgian and German consumption baskets are very similar, Belgium's industrial structure is very different from Germany's, as Belgium is specialised in producing semi-finished goods with relatively low added value, while German products generally have a higher added value.

Given the relatively high price elasticity of demand for the type of products made by Belgian industry, and taking account of the fierce competition in that sector, Belgian firms had relatively little room for manoeuvre in setting their prices; in that sector, real depreciation actually proved necessary. In Belgium the room for manoeuvre was all the smaller, as wage increases during certain sub-periods were incompatible with the maintenance of firms' competitiveness. Belgian industrial firms were therefore forced not only to moderate their price increases but also to achieve substantial productivity gains, which were attained via radical restructuring.

In contrast, if the real exchange rate of the economy is broken down on the basis of the consumer price index, the movement in relative prices in Belgium is comparable with the situation in Germany, and there appears to have been purchasing power parity in the tradable goods sector during the period considered. In that case, the baskets of goods on which the price measurements in the two countries are based appear far more similar.

Conclusion

In recent years, there have been numerous analyses and empirical studies on the scale and persistence of inflation differentials in the euro area. In EMU, that phenomenon may be important because those differences may influence the effectiveness of the Eurosystem's monetary policy. In order notably to take account of the inflation differentials, the Eurosystem recently clarified the definition of price stability and specified that the annual increase in the HICP in the euro area should be below but close to the 2 p.c. threshold. In addition since relinquishing their monetary sovereignty, the states are no longer able to correct imbalances by adjusting their monetary policy. Moreover, the Eurosystem does not have any instrument for eliminating such discrepancies. In some cases the EMU member countries therefore need to take appropriate measures to reduce those differences.

Since the monetary unification, the inflation differentials between Belgium and the euro area have not appeared to be very persistent. Nevertheless, empirical studies on the "Balassa-Samuelson" effect show that Belgium has a relatively high equilibrium inflation rate which exceeds the medium-term objective of the Eurosystem. This article examined those conclusions, which at first sight seem rather paradoxical.

The analysis shows that the high equilibrium inflation rate is due mainly to the fact that a crucial assumption underlying the "Balassa-Samuelson" theory, namely purchasing power parity in the sector exposed to international competition, does not hold true. The real exchange rate between Belgium and Germany for the tradable goods sector – on the basis of the value added deflator – seems to have depreciated sharply during the period examined, offsetting the positive productivity differential. Non-fulfilment of that assumption implies that the real exchange rate for the economy as a whole has remained relatively stable.

These studies were also based mainly on the value added deflator; however, since the consumer price index is the benchmark for the monetary authorities, it is essential to examine to what extent the conclusions obtained from analysis of the value added deflator can be extended to the HICP. The study on the basis of that price index also shows that the real exchange rate of the economy as a whole has remained relatively stable. Therefore, there does not seem to be any structural reason why inflation should be systematically higher in Belgium than in the euro area.

In conclusion, the inflation differentials between Belgium and the euro area do not seem to be very great or persistent. The ECB's monetary policy therefore seems appropriate to the Belgian economy from that point of view in the current environment.

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