Globalisation and monetary policy

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Introduction

A great many changes in the economic landscape are ascribed to globalisation. There can be no doubt that progressive globalisation has had a major influence on economic developments worldwide, and will continue to do so, and that it presents some significant challenges for economic policy.

However, globalisation is a complex phenomenon, lacking any clear-cut definition. In the current context, globalisation is defined as accelerating international economic integration, reflected in stronger growth of international trade in goods and services and in increased mobility of capital and labour.

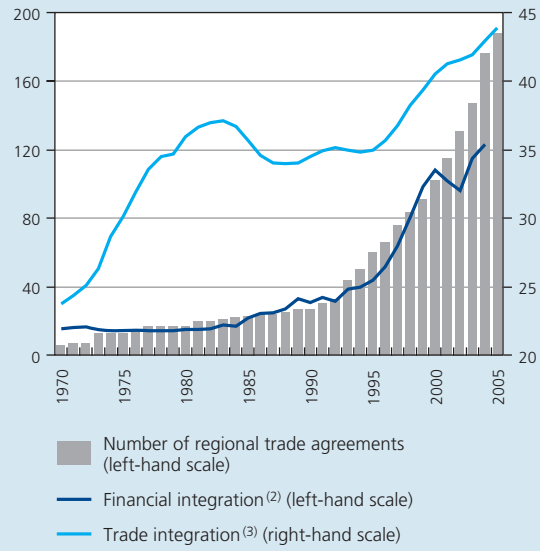
In recent decades, globalisation has speeded up as a result of the integration into the world economy of various large economies such as China, India and the new European Union Member States. There have been several contributory factors here. First, there has been rapid technological development, making it cheaper and quicker to exchange not only goods and services but also information. Also, the deliberate policy of liberalisation and deregulation in various countries has helped to accelerate globalisation. Instances include the gradual abolition of controls on capital movements in many countries and the sharp rise in the number of regional trade agreements since the mid-1990s, augmenting global trade and capital flows.

The openness of the industrialised countries, measured as the sum of their imports and exports, has increased rapidly in the past ten years from 35 p.c. of GDP to almost 45 p.c. of GDP in 2005, having already risen sharply in the 1970s. The progress of financial integration has been even more dramatic. Thus, in 2004 foreign direct investment and portfolio investment represented 124 p.c. of GDP, virtually triple the 1995 figure. There has therefore

(1) The author wishes to thank L. Aucremanne, A. Bruggeman and M. Collin for their contribution to this article.

CHART 1 SOME INDICATORS OF GLOBALISATION IN THE INDUSTRIALISED COUNTRIES (1)

(percentages of GDP, unless otherwise stated)



Sources: IMF, WTO.

(1) The industrialised countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

(2) Foreign direct investment and portfolio investment, sum of the assets and liabilities held abroad, as a percentage of GDP.

(3) Total imports and exports of goods and services as a percentage of GDP.

been a general acceleration in globalisation since the mid-1990s.

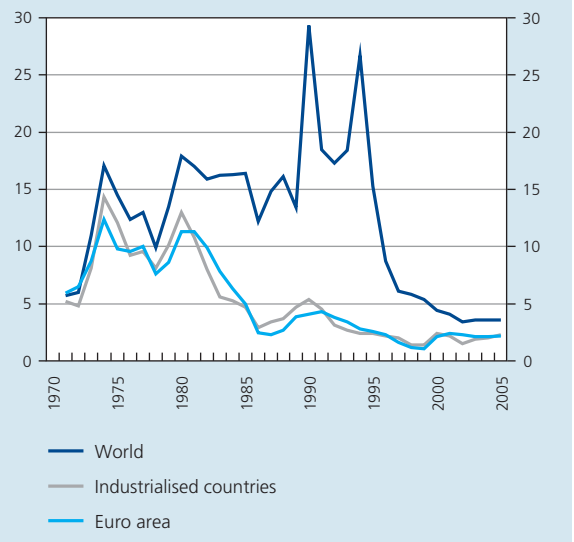
This article will now proceed to examine three potential effects of globalisation which may be important for monetary policy. The first section documents the current low and stable inflation, and explains how globalisation has played a role here. The second section tries to establish whether globalisation is one of the factors contributing to the apparent decline in the sensitivity of inflation to domestic economic activity. The separation of changes in the policy interest rates from long-term interest rate movements forms the subject of the third section. The fourth section investigates the possible implications for monetary policy, while the last section sums up the principal findings.

1. Has globalisation exerted downward pressure on inflation?

Inflation, measured by the consumer price index, has remained low and stable throughout the world since the mid-1990s. Having hovered around 10 p.c. in the industrialised countries during the second half of the 1970s, inflation eased steadily in the 1980s and 1990s, reaching a low of 1.4 p.c. in 1998. Since then, inflation has risen slightly, although the increase has been very small against the background of a 300 p.c.-increase in oil prices. It is not only the level of inflation that has declined: its volatility has also diminished, as a result of the fall in inflation persistence, i.e. the degree to which current inflation depends on its previous values[1]. This has reduced the impact of shocks on inflation, because their effects are not felt for so long. The current low inflation appears to be a global phenomenon, although in the developing countries the decline in inflation occurred later, only starting in 1995.

CHART 2 INFLATION SINCE 1971 (1)

(percentage changes compared to the previous year)



Sources: Fagan, Henry and Mestre (2005), ECB, IMF.
(1) Measured by the consumer price index.

1.1 Causes of low and stable inflation

The improvement in the conduct of monetary policy is undoubtedly a major factor in the evident decline in both the level and the persistence of inflation. The growing importance which the central banks of the industrialised countries have attached to price stability since the 1980s has been reflected in a number of institutional changes, such as the independence of the central bank, the introduction of quantitative inflation targets, and increased transparency. As a result of these changes, the central bank's inflation target – whether explicit or not – became a new, credible nominal anchor. That credibility was boosted further by the actual decline in inflation recorded in the 1980s, so that inflation expectations were more firmly anchored.

Apart from the improved conduct of monetary policy, another factor behind the lower inflation may be positive productivity shocks, whether or not related to globalisation, which have temporarily moderated inflation, and a more disciplined budgetary policy which has limited the inflationary impact of that policy. Some economists also emphasise the role played by globalisation and greater international competition.

Firstly, Rogoff (2003) argues that globalisation influences the level of the equilibrium inflation rate, because it reduces or even eliminates the inflation bias. That bias corresponds to the higher than optimum inflation level resulting from a central bank trying to bring the level of activity and employment closer to the perfect competition level by creating unexpected inflation. However, economic agents anticipate this central bank behaviour by adjusting their inflation expectations, so that the eventual result is an unchanged level of activity and employment, with higher inflation (Barro and Gordon, 1983). Since globalisation is leading to lower mark-ups on the product and labour markets, the central bank will be less inclined to stimulate the economy, so that the inflation bias will decline. In addition, the real effects of monetary policy are

(1) For a discussion of inflation persistence in the euro area, cf. Dhyne (2005).

more limited in a more competitive economy with more flexible wages and prices, and that should also reduce the tendency of central banks to conduct an expansive monetary policy. If globalisation has caused a temporary decline in inflation as well, that will have strengthened the credibility of monetary policy, making it easier to conduct that policy. Since globalisation has accelerated rapidly since the mid-1990s, that may explain the downward trend in inflation, especially in the developing countries. In the industrialised countries, however, inflation had already fallen to a low level during the 1980s.

Secondly, the emergence of the low-cost countries which has accompanied globalisation may have led the supply of products to increase faster than demand, thus having a moderating effect on the general level of prices. Conversely, however, monetary policy has been particularly accommodating in many parts of the world since 2001, counterbalancing the growth of supply.

Although globalisation may perhaps not have had any great visible impact on aggregate inflation in the industrialised countries, it has been accompanied by some major changes in the relative prices of products and production factors. Thus, the relative prices of commodities have risen sharply, while the emergence of the low-cost countries has pushed down the relative prices of manufactured goods. In addition, greater international competition has influenced wages and prices in the industrialised countries. Thus, it is reducing mark-ups in the product and labour markets, while the strong expansion of the labour supply is depressing the relative price of labour.

In principle, these relative price changes are neutral for overall inflation, as falls in the relative prices of certain categories of products will be offset by increases in those relative prices of other products or services, partly because consumers use their higher purchasing power to buy other products, and vice versa. However, there may be temporary effects on the headline inflation rate if some relative price changes are passed on more quickly than others, or if compensatory price changes take time to appear.

The next section discusses the relative price changes accompanying globalisation, dealing first with the increases in the relative prices of commodities before illustrating the decline in the relative prices of manufactured goods.

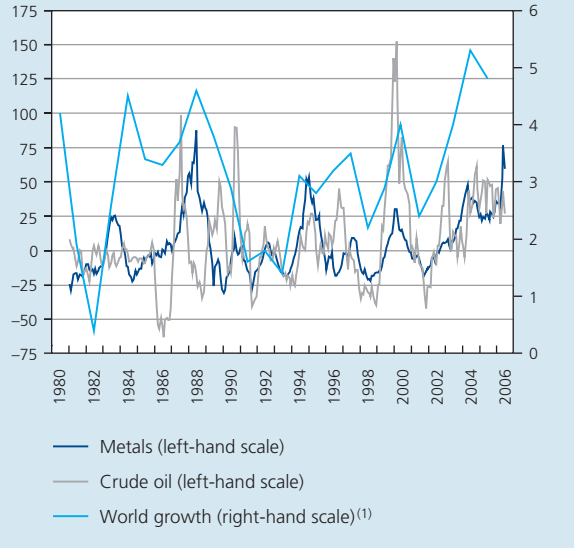
1.2 Impact of globalisation on a number of relative prices in the industrialised countries

1.2.1 Impact of growing world demand for commodities

Driven by strong demand, emanating mainly from the United States and the emerging Asian economies, commodity prices have soared to unprecedented heights. Between January 2004 and June 2006, prices of crude oil and metals increased by 117 p.c. and 111 p.c. respectively. The fact that those price rises were simultaneous indicates that the reasons lay primarily in demand rather than supply factors, since the latter are specific to each particular market. Since 1995 there has been a stronger correlation between the movements in the various commodity prices. While the correlation between the changes in crude oil and metal prices[1] was only 0.06 over the period from January 1981 to December 1994, the correlation was 0.54 between January 1995 and June 2006. In the more recent period, the pattern of crude oil prices has evidently been more closely linked to world economic growth, whereas in the past, world growth was only correlated with the movement in metal prices. This suggests that the current commodity price rises are largely due to globalisation and the associated strong demand for commodities. However, the possibility remains that geopolitical tensions and speculation may also have played some part in driving commodity prices to their present

CHART 3 COMMODITY PRICES AND WORLD GROWTH

(monthly data in US dollars, unless otherwise stated ; percentage changes compared to the corresponding period of the previous year)



Source : IMF.
(1) Annual data in volume terms.

(1) On the basis of an index published by the IMF giving the prices of copper, aluminium, iron ore, tin, nickel, zinc, lead and uranium.

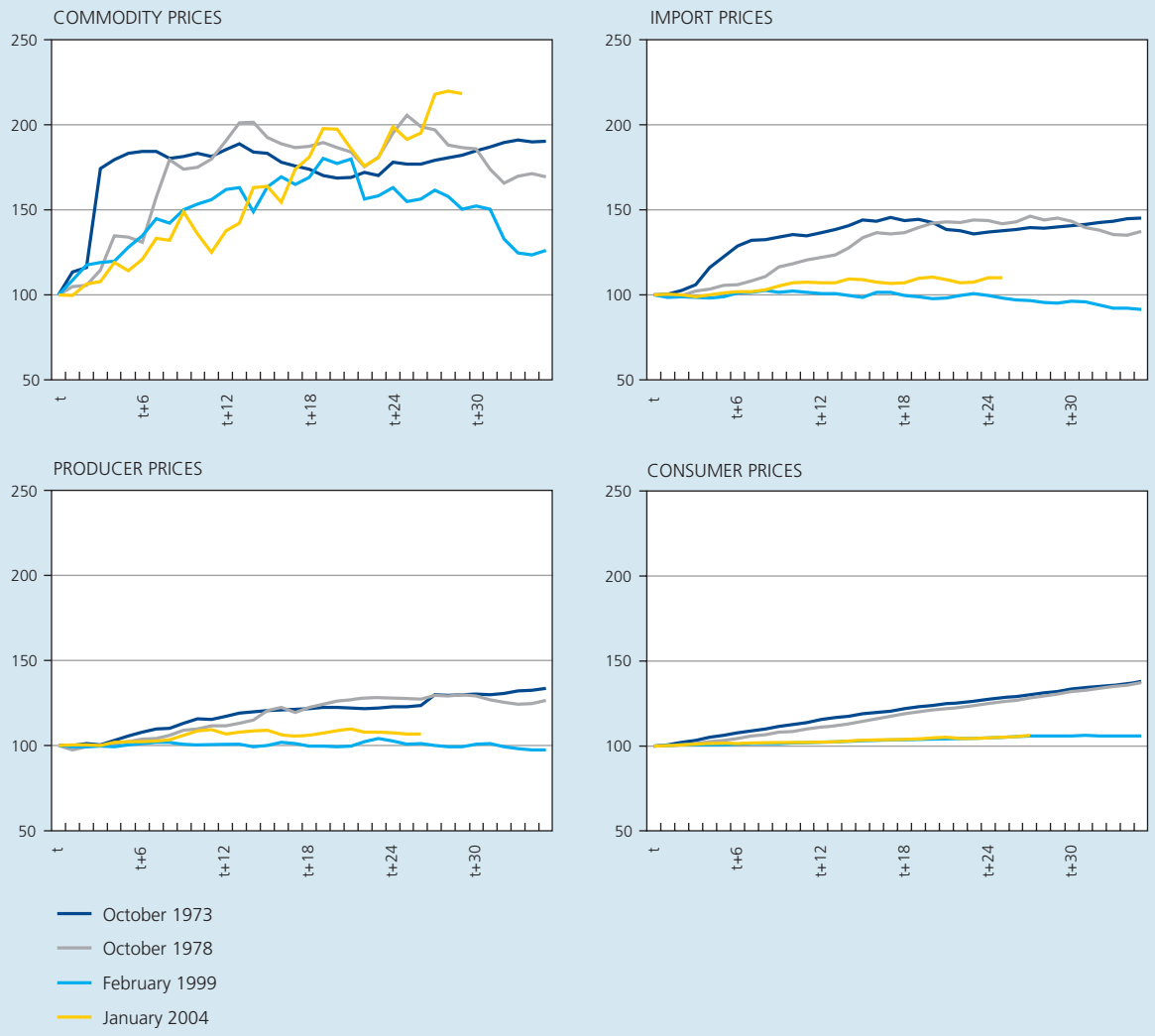
high level. For instance, the sharp commodity market correction in May and June can be attributed largely to the unwinding of speculative positions.

The rise in crude oil prices has a direct effect on headline inflation via the energy component of the consumer price index. In addition, indirect effects may also occur if the surge in commodity prices pushes up production costs of firms, and those increases are then passed on in selling prices. Finally, apart from the first-round effects mentioned, there may also be second-round effects, particularly if wage increases offset part of the loss of purchasing power resulting from the direct and indirect first-round effects. If firms in turn pass on those wage increases in their selling prices, a price-wage spiral may be triggered, which not only augments the upward pressure on inflation generated by an oil shock, but also makes it more persistent.

The direct influence of higher energy prices is considerable in the current low inflation environment. For example, the contribution of the energy component to overall inflation in the euro area was 0.8 percentage point in 2005, against an average of 0.2 percentage point from

CHART 4 TRANSMISSION OF COMMODITY PRICES TO IMPORT PRICES, PRODUCER PRICES AND CONSUMER PRICES IN THE INDUSTRIALISED COUNTRIES (1)

(indices, monthly data (2))



Sources: IMF, HWWA, NBB.

(1) The industrialised countries are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

(2) The first month on the horizontal axis corresponds respectively to October 1973, October 1978, February 1999 and January 2004.

1991 to 1999. Despite this substantial direct effect, there do not appear to be any significant indirect and second-round effects as yet. For instance, consumer prices of non-energy industrial goods and those of services increased by 0.3 p.c. and 2.1 p.c. respectively in the euro area in 2005.

This limited transmission of higher commodity prices to the later production stages emerges most clearly if four periods of rising commodity prices are compared. The periods considered begin respectively in October 1973 (first oil shock), October 1978 (second oil shock), February 1999 (previous increase in commodity prices) and January 2004 (current increase in commodity prices). This comparison reveals that, although the current commodity price rise is larger than in the previous periods of rising commodity prices, the transmission to later stages in the production process has been very limited in comparison with previous periods. Thus, over the 24 months following January 2004 (current commodity price rise), import prices increased by only 7.5 p.c., in stark contrast to the cumulative increase in import prices of 35.5 and 44.1 p.c. respectively following the first and second oil shocks. The picture is similar for producer and consumer prices during both the current and the previous period of rising commodity prices. Analysis of the movement in labour costs in various euro area countries during the considered periods of rising commodity prices shows that the increase in labour costs was also only modest during the current and previous phases of rising commodity prices, while that increase was very pronounced during and after the oil shocks of the 1970s. The absence of those second-round effects in the more recent periods does much to explain the limited increase in inflation following the steep commodity price rises.

Various factors can be put forward to explain that limited inflationary impact of the commodity price rises. The first which can be mentioned is the change in the monetary policy regime compared to the 1970s. The crucial importance which central banks now attach to price stability has made it possible to anchor inflation expectations more firmly, so that rising commodity prices are not automatically translated into higher inflation expectations.

Secondly, structural changes in the industrialised economies also play a part in the reduced pass-through of commodity prices to consumer prices. In the first place, industry's share of GDP has declined systematically over the past thirty years, in favour of the tertiary sector which is less commodity-intensive. Production of manufactured goods has been partly relocated to the low-cost countries, so that the industrialised countries have become less sensitive to fluctuations in commodity prices. In addition, industry has become more efficient in its use of commodities. Generally speaking, one unit of output nowadays requires a smaller quantity of commodities than in the 1970s.

Thirdly, globalisation may also be a factor in reducing the transmission of commodity prices to subsequent stages in the production process. The increased competition associated with globalisation makes it more difficult for firms to raise their selling prices when commodity prices increase. However, from the theoretical angle, it must be said that, in principle, this can only be a temporary phenomenon, confined to the phase in which mark-ups are reduced to the level of perfect competition. Once the mark-ups have been cut, firms will feel a greater need than previously to increase their selling prices when production costs rise. However, it is not very likely that mark-ups have already been reduced to that extent. In addition, the threat of the relocation of production to the low-cost countries has a moderating influence on wage demands, even after a steep rise in energy prices, and that tempers inflation. Finally, it is possible that the transmission of commodity price rises is compensated by the falling prices of imported labour-intensive goods from the low-cost countries. That aspect of globalisation will be discussed in the next section.

1.2.2 Impact of increased supply of labour-intensive goods

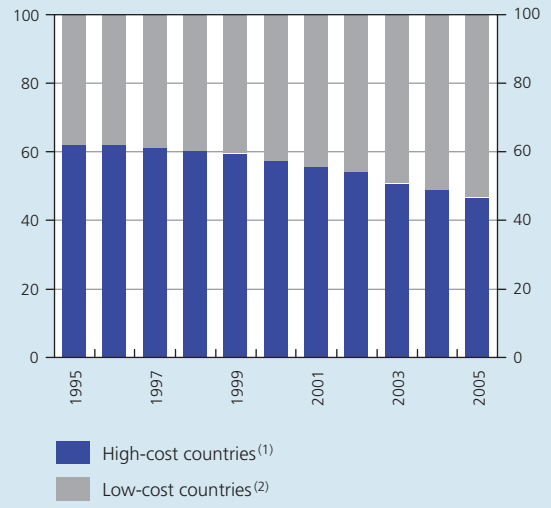
Globalisation is often associated with downward pressure on the relative prices of imported labour-intensive goods (cf. Kamin, Marazzi and Schindler, 2006). In fact, globalisation has meant a considerable expansion in the world's production capacity, greatly increasing the low-cost countries' share of world trade. As a direct consequence, import prices rise more slowly the larger the share of final imports originating from the low-cost countries. This direct effect on inflation impacts mainly on the non-energy industrial goods component of the consumer price index. Cheaper intermediate imports from the low-cost countries may also depress production costs of domestic firms, generating an indirect, moderating influence on inflation if these lower production costs are passed on in selling prices. In addition, keener international competition may inhibit inflation temporarily via four other channels. First, domestic firms may have to cut their profit margins in order to remain competitive on the international market. Second, globalisation has a moderating influence on real wage increases, because employees feel the competition from a very large group of potential workers, and employers are not inclined to grant real wage increases because they want to remain competitive. Third, stronger international competition can also drive up productivity in the industrialised countries, as firms are encouraged to

invest more heavily in research and development in order to boost productivity, and that in turn produces a cost advantage. In addition, growing international specialisation permits the exploitation of comparative advantages. Finally, the decline in the relative prices of manufactured goods could possibly produce second-round effects. The changing geographical structure of imports of manufactured goods from outside the euro area is outlined below. The downward pressure which the rising share of imports from low-cost countries exerts on relative prices at the various stages of production will then be illustrated for two specific product categories.

If euro area imports of manufactured goods[1] from countries outside the euro area are broken down into those from high-cost countries and those from low-cost countries, the share represented by the low-cost countries has clearly risen over the period 1995 to 2005. In terms of the value of imports of manufactured goods from outside the euro area, the share of the low-cost countries in total imports increased from 38 p.c. to 53 p.c. over the period considered. We can expect this rising share of imports from the low-cost countries to have a moderating effect on import prices of manufactured goods and, at a later stage, on producer and consumer prices. The next section illustrates this for two specific product categories where the share of imports from low-cost countries rose sharply over the period considered, while Box 1 discusses a number of studies which attempt to estimate the mechanical impact on aggregate inflation of the integration of the low-cost countries.

CHART 5 GEOGRAPHICAL STRUCTURE OF EURO AREA IMPORTS OF MANUFACTURED GOODS

(percentage of imports by value from outside the euro area)



Sources: EC and own calculations.
(1) The high-cost countries are Australia, Canada, Denmark, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States.
(2) The low-cost countries are the other countries outside the euro area.

(1) Imports of manufactured goods correspond to imports under headings 5 to 8 of the SITC classification.

Box 1 – Impact of low-cost countries on inflation in industrialised countries

This box discusses a number of studies which try to investigate how the growing share of imports from low-cost countries influences inflation in the industrialised countries.

On the basis of a regression analysis, Kamin et al. (2006) show a statistically significant, negative correlation between sectoral import price inflation in the United States and the change in China's share of imports in the sector concerned. Their estimates suggest that, in view of the observed increase in that country's share of US imports, China has exerted downward pressure of around 0.8 percentage point per annum on import price inflation in the United States over the past decade. Using a different methodology, Kamin et al. (2006) calculated China's contribution to import price inflation in the case of goods for a large number of industrialised countries. For this purpose, the annual average import price inflation over the period 1993-2001 was broken down into China's contribution and that of the rest of the world. The findings reveal that Chinese imports exerted downward pressure averaging 1.03 percentage points per annum in the United States over the period considered. However, China's contribution to goods import price inflation depends very much on China's weight in those imports. For example, in the case of Belgium, where imports from China represented only 2.7 p.c. in 2001, China's contribution to import price inflation is estimated at only -0.29 percentage point per annum.

BREAKDOWN OF ANNUAL AVERAGE IMPORT PRICE INFLATION OVER THE PERIOD 1993-2001

(Percentage points, unless otherwise stated)

	Total import price inflation (1)	Effect of the rest of the world	Effect of China	China's share in 1993 (1)	China's share in 2001 (1)	Change in share
Belgium	–0.75	–0.48	–0.29	1.8	2.7	0.9
France	–1.40	–1.36	–0.04	2.6	4.1	1.5
Germany	–1.74	–1.56	–0.16	3.5	4.8	1.3
Japan	–0.75	0.44	–1.19	10.3	20.6	10.3
United States	0.44	1.48	–1.03	9.2	14.3	5.1

Source: Kamin *et al*. (2006).
(1) Percentages.

In the latest issue of its "Economic Outlook", the OECD estimates the impact of cheaper imports from China and South-East Asia on the deflator of domestic demand in the euro area and the United States (OECD 2006). According to the OECD calculations, imports from Asia have inhibited the rise in the deflator of domestic demand in the euro area and the United States over the period 2001-2005 by 0.28 and 0.11 percentage points respectively. In the first half of the 1990s, this moderating effect was only 0.03 percentage point for both economies, whereas in the second half of the 1990s imports from Asia made a positive contribution of 0.05 percentage point in the euro area and a negative contribution of 0.12 percentage point in the United States.

According to the IMF (IMF, 2006), for a panel of advanced economies, a fall in the real import price has only a limited effect on consumer price inflation, and the effect disappears relatively quickly, namely after about three years. Simulations based on these estimates show that the faster than average fall in import prices (excluding oil) during the period 1997-2005 exerted downward pressure on inflation averaging 0.16 percentage point in a group of advanced economies. For the United States, this moderating effect is estimated at 0.46 percentage point.

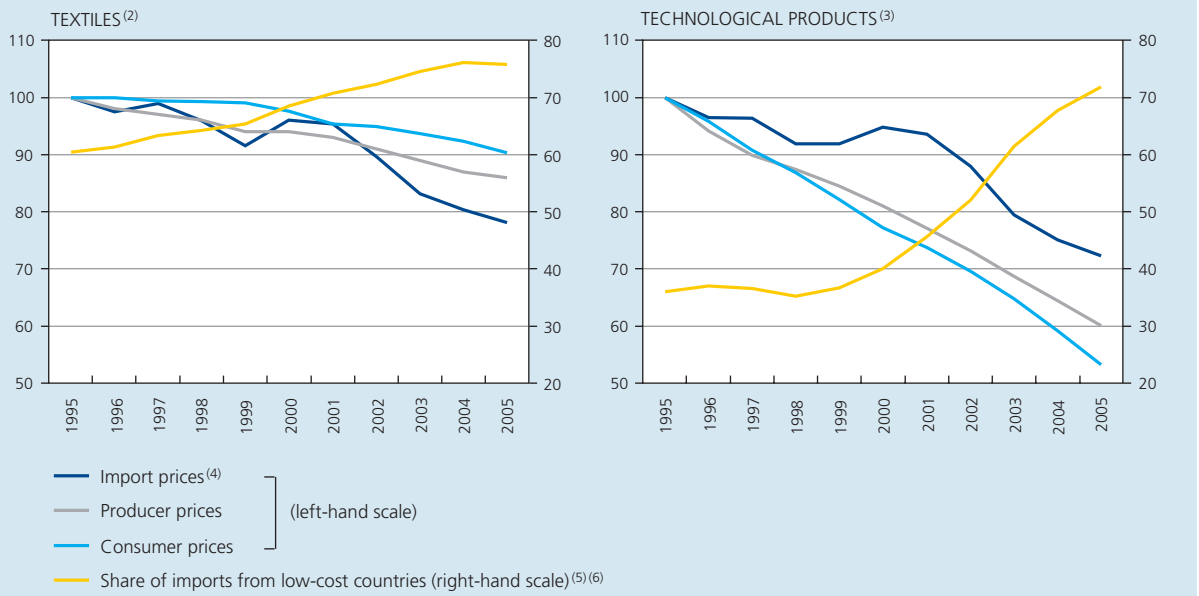
Overall, the estimated effects of globalisation on aggregate inflation appear to be limited, but are also heavily dependent on the period in question, the methodology used and the price index considered.

In value terms, the share of the low-cost countries in the textile product category has risen steadily, from 60 p.c. in 1995 to 76 p.c. in 2005. This high and growing share of imports was reflected in declining relative import prices, measured on the basis of unit values over the period considered. In real terms, textile import prices have fallen by 20 p.c. over the past ten years. This decline in relative import prices also lowered the relative producer and consumer prices of those products. However, the fall in consumer prices was less steep, since domestic costs in the production stage and transport and distribution margins displayed a more neutral pattern.

The share of imports from low-cost countries in technological products showed an even more dramatic rise, namely from 36 p.c. in 1995 to 71 p.c. in 2005. Relative import prices, measured on the basis of unit values, declined sharply in this sector, falling by around 25 p.c. In this product category there has also been major technological progress, enabling these products to be produced more cheaply. The corresponding items in the producer and consumer price index recorded an even sharper fall. The discrepancy between the trend in the unit values of imports and the movement in producer and consumer prices may perhaps be due largely to differences in adjustments for changes in product quality. Unit values of imports are not adjusted, so that the import price trend

CHART 6 DECLINE IN RELATIVE PRICES OF TEXTILES AND TECHNOLOGICAL PRODUCTS IN THE EURO AREA [1]

(Indices 1995=100, unless otherwise stated; annual data)



Sources: EC and own calculations.

(1) Prices deflated by the HICP.

(2) The categories for import prices, producer prices and the HICP are respectively "Textile yarn, fabrics, made-up articles not elsewhere specified and related products", "Manufacture of textiles and clothing" and "Clothing".

(3) The categories for import prices, producer prices and the HICP are respectively "Telecommunication and sound recording and reproduction equipment and appliances", "Manufacture of radio, television and communication equipment" and "Sound and video recording and reproducing apparatus".

(4) Import prices are unit values.

(5) The low-cost countries are all countries outside the euro area except Australia, Canada, Denmark, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States

(6) Percentages of total imports from countries outside the euro area.

may be subject to an upward bias, whereas the producer and consumer price indices are adjusted.

These price movements show that globalisation has influenced certain import prices and that the decline in relative prices is being passed on in consumer prices. According to the studies discussed in Box 1, however, these relative price falls have only a minor effect on aggregate inflation, although that impact is difficult to quantify precisely.

2. Has globalisation reduced the amplitude of cyclical fluctuations in inflation ?

2.1 A weaker link between inflation and the domestic economic cycle

Inflation is influenced to some extent by the level of economic activity or the business climate, and more particularly by the volume of excess demand measured in terms of the output gap [1]. Other factors, such as inflation expectations and the impact of cost-push shocks, also help to explain inflation. The link between inflation and the business cycle is generally illustrated by means of the Phillips curve [2]. The following equation can be estimated for the euro area :

$$\pi_t = \mu + \rho\pi_{t-1} + \beta GAP_{t-1} + \varepsilon_t$$

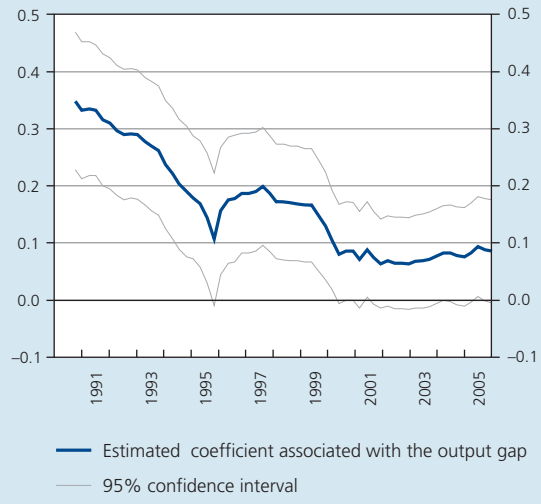
where π represents the year-on-year change in the HICP, *GAP* corresponds to the output gap and ε represents an error term which allows, in particular, for the effect of cost-push shocks not included in the model. The estimated parameters are μ, ρ and β, or respectively the constant, the autoregressive component of inflation, which measures inflation persistence, and the slope of the estimated Phillips curve. This equation is estimated on the basis of

(1) The output gap is defined as the percentage difference between real and potential GDP. The next section proxies potential GDP by applying a Hodrick-Prescott filter (with a smoothing parameter of 1600) to real GDP on a quarterly basis.

(2) For a description of the development of the Phillips curve in Belgium, the euro area and the United States, cf. NBB (2002).

CHART 7 COEFFICIENT ASSOCIATED WITH THE OUTPUT GAP IN THE EURO AREA

(slope of the estimated Phillips curve for a series of moving twenty-year periods [1])



Sources: Fagan, Henry and Mestre (2005), OECD and own calculations.

(1) For each twenty-year period, ending in the quarter considered, the estimated coefficient β is obtained from the following equation: $\pi_t = \mu + \rho\pi_{t-1} + \beta GAP_{t-1} + \varepsilon_t$

quarterly data for the euro area for a series of moving twenty-year periods. Each period therefore covers eighty quarters and moves by one quarter at a time. This exercise shows that the Phillips curve becomes flatter the more recent the period considered. While the estimated slope of the Phillips curve (β) was 0.35 between the first quarter of 1971 and the fourth quarter of 1990, that value dropped to 0.09 for the last period considered, namely from the first quarter of 1986 to the fourth quarter of 2005.

The flattening of the traditional Phillips curve, expressed in terms of the domestic output gap, evident in the euro area, appears to be a global phenomenon, as the impact of the output gap on inflation is declining in a large group of industrialised countries. That is clear from estimation of the above equation for a large number of industrialised countries for two periods, namely one which runs from the first quarter of 1980 to the fourth quarter of 1992, and a second running from the first quarter of 1993 to the fourth quarter of 2005. These estimates show that the direct effect on inflation of a 1 p.c. increase in the output gap (β) has declined in the majority of the industrialised countries considered. The cumulative impact on inflation of a 1 p.c. increase in the output gap was also calculated over a one-year period on the basis of the estimated parameters [1]. In fourteen of the sixteen industrialised countries concerned, the domestic output gap had a smaller influence on inflation over the period 1993-2005, compared to 1980-1992. However, the size of the change varies greatly between countries. In Belgium, for example, a 1 p.c. larger output gap would have implied a cumulative effect on inflation of 0.45 percentage point in the 1980s, whereas in the 1990s the effect would have ceased to be significant. In Italy, the United Kingdom, Norway, New Zealand and Sweden, the reduction in the cumulative impact would have been even greater, whereas an increase can be recorded for France and Australia. Generally speaking, however, inflation has become less sensitive to the domestic output gap.

2.2 Possible reasons for the flatter Phillips curve

Various factors can be put forward to explain the flattening of the Phillips curve. A first series of factors can be attributed to the fact that the monetary policy geared to price stability may have exerted downward pressure on the slope of the Phillips curve. First, the economic agents do not revise their inflation expectations, or only slightly, in the light of changing economic conditions if there is a credible monetary policy maintaining price stability, so that the fluctuations in inflation itself are limited. Also, the greater importance which central bankers have come to attach to price stability has probably also implied better control over the inflationary impact of cost-push shocks. This has led to lower inflation variance, at the expense of higher output gap variance. In contrast to demand shocks, cost-push shocks oblige policy-makers to choose between stabilising inflation or stabilising economic activity. The increased variance in the output gap combined with the lower inflation variance results, ex post, in a flatter Phillips curve. Finally, the lower and less volatile inflation may have encouraged firms to adjust their prices less frequently, and that in turn results in a flatter Phillips curve.

Structural changes in the production processes in the economies considered may be a second key reason for the flatter Phillips curve, because more flexible production processes mean that output can be changed across the economic cycle without causing major fluctuations in marginal costs, which in turn reduces the fluctuations in inflation [2].

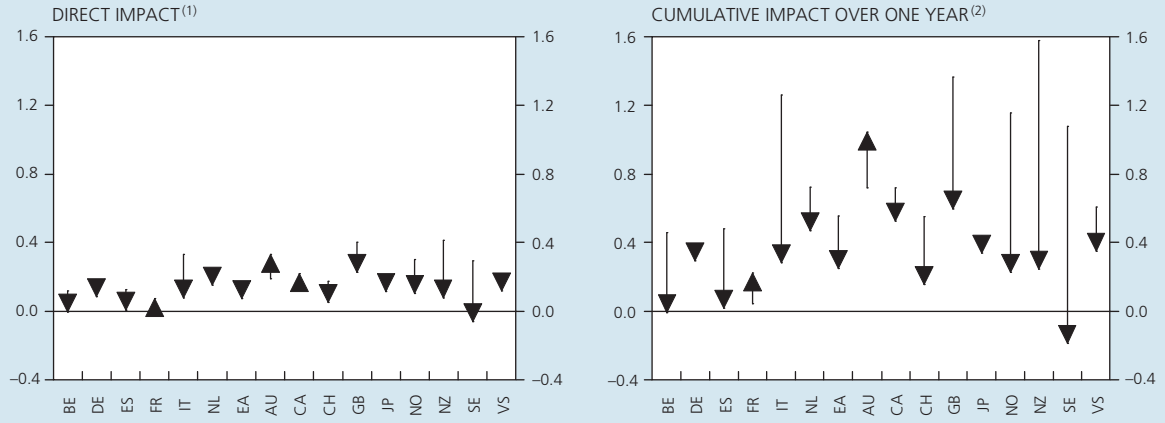
Globalisation may be a third significant reason for the flatter Phillips curve. Indeed, the flattening of the Phillips curve does seem to be a global phenomenon, which

(1) This cumulative impact corresponds to $\beta(1 + \rho + \rho^2 + \rho^3)$, since inflation persistence implies that the effect of a higher output gap has a longer lasting impact on inflation. Thus, the change in the cumulative inflationary impact of the output gap is a combination of the change in the estimated direct impact (β) and the change in the estimated inflation persistence (ρ).

(2) The microeconomic basis of the new-Keynesian Phillips curve links current inflation in the first instance to the deviations in real marginal costs from their equilibrium level. Under certain conditions, these show a positive, linear correlation with the output gap, so that the Phillips curve is often expressed in terms of this last variable.

CHART 8 DECLINE IN THE IMPACT OF THE OUTPUT GAP ON INFLATION

(the arrow indicates the change between the periods 1980-1992 and 1993-2005)



Sources: Fagan, Henry and Mestre (2005), IMF, OECD and own calculations.

(1) For each period, the change in the estimated coefficient β is indicated by the following equation: $\pi_t = \mu + \rho\pi_{t-1} + \beta GAP_{t-1} + \varepsilon_t$

(2) The change in $\beta(1 + \rho + \rho^2 + \rho^3)$ is shown for each period on the basis of the estimated coefficients obtained from the following equation: $\pi_t = \mu + \rho\pi_{t-1} + \beta GAP_{t-1} + \varepsilon_t$

therefore demands a global explanation. First, in a globally integrated economy, the prices of a growing number of goods and services are determined by global rather than purely domestic demand and supply factors. Changes in demand for goods and services can then, at least to some extent, be met by foreign production, reducing the inflationary pressure of domestic origin. Furthermore, strong foreign competition may curtail the market power of domestic firms, so that they can only introduce modest price increases during an economic upturn. The same reasoning applies to wages: in an improved economic climate, wage demands will also be modest owing to the real or virtual threat of relocation. In theory, just as in the case discussed before, the moderating influence on the cyclical pattern of inflation exerted by the reduction in market power would be confined to the phase in which mark-ups are being reduced. Once mark-ups are sufficiently low, firms are obliged to pass on cost increases, so that in the long run globalisation could actually increase the cyclical variations in inflation.

In the latest issue of its "World Economic Outlook", the IMF tries to determine the relative importance of the various factors which may lie behind the flattening of the domestic Phillips curve (IMF, 2006). The results, based on a panel of nine industrialised countries, indicate that greater openness and increased monetary policy credibility account each for about half of the reduction in the slope of the Phillips curve.

According to Borio and Filardo (2006), global demand and supply factors now play a greater role in explaining cyclical inflation movements. By extending the Phillips curve to include a global output gap, which is a yardstick for the business climate in the rest of the world, and estimating this for a panel of seventeen industrialised countries over a series of moving periods, they find that the coefficient for the global output gap increases if more recent periods are taken into account. Although the results must be interpreted with a degree of caution, they appear to indicate that global demand and supply factors are playing an increasingly important role in the cyclical movements in inflation, especially when observations since 2000 are taken into account (1).

Ciccarelli and Mojon (2005) have shown that, for a large number of industrialised countries, the national inflation figures are attracted by a global inflation measure, which in itself accounts for almost 70 p.c. of the variance in the national inflation figures. They also found indications of a global Phillips curve in the sense that global inflation can be partly attributed to global activity, measured on the basis of the rate of growth in industrial output. These two findings suggest that global factors play an important role in determining domestic inflation.

Overall, there are therefore ample indications that inflation has become less cyclical. However, since there are many potential factors which may explain this development, it

(1) Chapter 4 of the BIS Annual Report also provides some information on this (BIS, 2006).

is difficult to establish the exact marginal contribution of each factor and, more specifically, the extent to which this phenomenon is influenced by progressive globalisation.

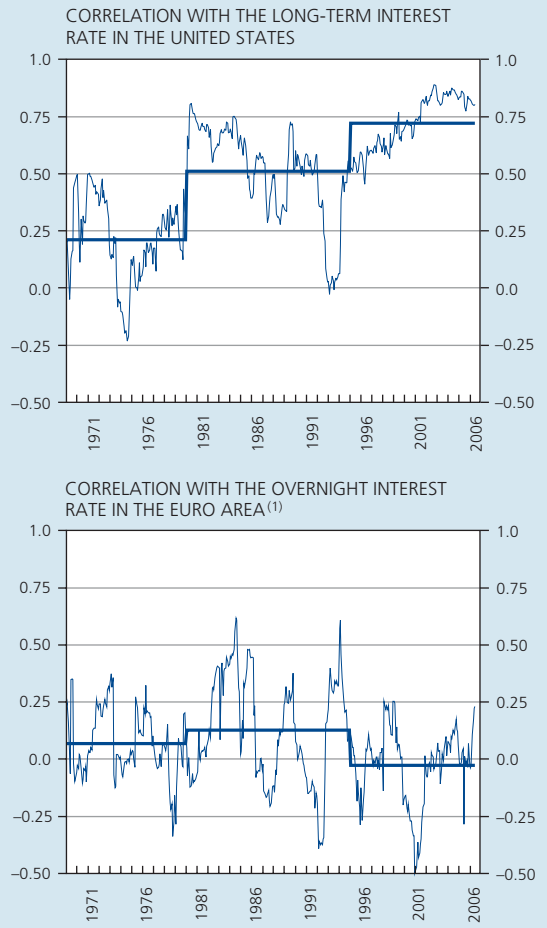
3. Has globalisation severed the link between official interest rates and long-term interest rates?

In recent years, long-term interest rates in the industrialised countries have displayed much greater similarity than they used to. Although the upward and downward trends often occurred in parallel in the 1970s and 1980s, there were still substantial differences of level. During the 1970s and 1980s, these interest rate differences largely reflected the divergences in the level of inflation between the various countries. However, if the analysis focuses on the changes in long-term interest rates, that again reveals a closer correlation in the recent period. Although the coefficients of correlation – calculated for a series of moving 24-month periods – between the changes in long-term interest rates in the United States and those in the euro area[1] present a decidedly volatile picture, a number of tendencies nevertheless emerge. For the series of periods ending between 1969 and 1980, the moving coefficient of correlation fluctuated widely around an average of 0.21, but without exhibiting any marked tendency. For the series of periods ending between 1981 and 1994, the average correlation coefficient of 0.51 was considerably higher, though once again there was no clearly discernible trend. In contrast, since the mid-1990s, the moving correlation coefficient has continued rising to an average of 0.72 for the series of periods ending between 1995 and 2006. Moreover, an upward trend is apparent, so that the correlation coefficient was around 0.8 in the last period considered. This is clear evidence that changes in long-term interest rates are indeed becoming more synchronised.

In view of this increased international coherence in interest rates, the question is to what extent long-term interest rate changes in the euro area are still connected with adjustments to the main Eurosystem interest rates. The moving correlation coefficients between changes in the overnight interest rate and the long-term interest rate, again calculated over 24-month periods, indicate that the closer international links between long-term interest rates do not necessarily mean that the correlation between changes in the long-term interest rate and the overnight rate is diminishing in the euro area. This correlation was already very small in Germany for the periods ending between 1969 and 1994, and that may be due to the credibility of German monetary policy[2]. Nevertheless, this correlation is slightly negative for the series of periods ending between 1995 and 2006. Yet the same pattern is apparent in the United States, indicating that the weak link between the official interest rate and the long-term interest rate is not a purely European phenomenon, attributable to the dominant influence of the American long-term interest rate. The long-term interest rate in the United States rose by only 40 basis points over the period from June 2004 to May 2006, while the Federal Reserve raised the fed funds rate by 400 basis points over that period.

CHART 9 CORRELATION BETWEEN CHANGES IN THE LONG-TERM INTEREST RATE IN THE EURO AREA AND CHANGES IN THE LONG-TERM RATES IN THE UNITED STATES AND THE OVERNIGHT RATE IN THE EURO AREA RESPECTIVELY[1]

(moving correlation coefficient for 24-month periods[2])



Source: BIS and own calculations.
(1) Euro area for the period 1999-2006 and Germany for the period 1967-1998.
(2) 24-month periods ending during the month considered.

(1) Euro area for the period 1999-2006 and Germany for the period 1967-1998.
(2) Christiansen and Pigott (1997) put forward some arguments on this subject.

A possible explanation for the severing of the link between the official interest rates and the long-term rates is the fact that inflation expectations are more firmly anchored, so that fluctuations in the short-term interest rate are seen as a short-term phenomenon, and therefore do not trigger adjustments to the long-term rate.

In addition, progressive globalisation has been a factor depressing especially the yield on US government bonds. The substantial savings surplus built up by the emerging economies and oil-producing countries is used partly to finance the American economy's large savings deficit. Since 2000, foreign demand for US government bonds has soared, with most of that increased demand originating from official bodies. The Asian countries have also been holding more US government bonds since 2000, probably because of the policy of the Asian central banks, aimed at preventing their currency from appreciating. Although it is not possible to give an accurate estimate of how these capital flows to the United States have affected the long-term interest rate, it seems highly likely that the strong demand from the Asian central banks has had a significant downward influence on the US long-term interest rate.

The situation of ample liquidity combined with increased risk aversion on the financial markets following the heavy stock market losses of 2000-2002 also contributed to the strong demand for long-dated government bonds. In addition, insurance companies and pension funds want to match the maturity of their assets more closely to that of their liabilities, in accordance with the new IAS/IFRS accounting rules, so that they, too, are generating stronger demand for risk-free government paper with a fairly long maturity.

4. Potential implications for monetary policy

This section examines the potential monetary policy implications of the three economic trends discussed above, and their link to globalisation.

As regards the low and stable inflation, it can be said that, certainly in the industrialised countries, this has more to do with the improved conduct of monetary policy than with increasing globalisation. However, the latter is associated with substantial changes in the relative prices of products and production factors. In principle, such changes in relative prices are neutral for inflation in the longer term, but in the shorter term they may have some effect. Moreover, since globalisation is a gradual and progressive process, it remains possible that – in the end – inflation over a fairly long period will have been (and will continue to be) influenced by a succession of effects which, taken individually, are generally short-lived. However, the net impact of these short-term effects is difficult to discern. Nonetheless, Box 2 makes a number of points which suggest that the effect of globalisation via imports may have been slightly positive in the euro area over the past seven years (1999-2005), but significantly smaller than is implied by the deviation between headline inflation and the underlying trend in inflation. Moreover, inflation has also been curbed, in particular, by wage moderation so that globalisation has also influenced domestic inflation. The overall effect has therefore probably been downwards, but it is difficult to identify ex post because the accommodating monetary policy stance in many parts of the world has counterbalanced it. Furthermore, that overall effect may vary over time, and may sometimes even change its sign, making economic analysis and hence monetary policy more complex.

In this context, the challenge for monetary policy lies in tolerating the direct and indirect effects of such relative price changes, while at the same time preventing the emergence of second-round effects. Nowadays, most central banks tolerate the first-round effects of an upward relative price shock. For example, they do not react immediately by raising interest rates if inflation exceeds their target as a result of a steep rise in commodity prices, but do so only if they see a danger of second-round effects. The downward relative price shocks which may result from globalisation require, mutatis mutandis, a similar response although the symmetry of this reasoning is sometimes questioned. In other words, the first-round effects of a positive supply shock should also be tolerated, and therefore need not trigger an immediate easing of monetary policy unless declining inflation expectations could culminate in deflation.

Indeed, globalisation is often associated with risks of deflation, and the response to that takes many forms. For instance, the IMF (2006) advocates a sufficiently high inflation target, so that positive supply shocks do not entail an imminent danger of deflation[1]. Others, such as White (2006), ask whether the inflation target should not be lowered instead, to take account of the fact that globalisation is a gradual process, and may thus tend to curb inflation over a fairly long period. If insufficient account is taken of the first-round character of that moderating influence, monetary policy is liable to be too expansionary, and thus contribute to imbalances on the financial and real estate markets.

(1) In this connection, reference may also be made to the background studies on the zero lower bound of the nominal interest rate, conducted during the assessment of the ECB's monetary policy strategy (ECB, 2003). These studies reveal that the ECB's current quantitative inflation target (inflation below but close to 2 p.c.) is sufficiently high to cushion the impact of deflationary shocks.

BOX 2 – Inflation indicators in a context of globalisation

Headline inflation – in the euro area it is the HICP – is fully affected by the short-term impact of the relative price changes resulting from globalisation. That is precisely why measures of the underlying trend in inflation are often used, since they generally have the characteristic of being less influenced by the impact of relative price changes. Moreover, they are also deemed to measure inflationary pressure of domestic origin.

However, the traditional measure of the underlying inflation trend, namely the HICP excluding unprocessed food and energy, takes the relative price changes caused by globalisation asymmetrically into account, so that its relevance for measuring domestic inflationary pressure was recently called into question (ECB, 2005). The measure in fact discards the effect of higher energy prices while retaining the full downward influence on prices of manufactured goods: both the effect via cheaper imports and that via domestic cost reduction. In contrast, the GDP deflator measures only the movement in the price of domestic value added, so that – in principle – it is not affected by changes in import prices, and is only subject to any effects which globalisation exerts on domestic prices, either via wage moderation or by driving up productivity or squeezing profit margins. By comparing the underlying inflation trend with the GDP deflator, it is therefore possible to form an overall idea of how cheaper imports of manufactured goods influence inflation. If underlying inflation is lower than the percentage change in the GDP deflator, one can conclude that cheaper imports of labour-intensive goods have made a substantial negative contribution to inflation. However, it must be said that the GDP deflator takes account of the price movement of all value added, and not only that included in private consumption.

INFLATION INDICATORS IN THE EURO AREA

(percentage changes compared to the previous year)

	Average for the period 1999-2005		2005	
Headline inflation (1)	2.0	0.1	2.2	0.4
GDP deflator	1.9		1.8	
		–0.2		–0.3
Underlying trend in inflation (2)	1.7		1.5	
p.m. Unit labour costs	*1.6*		*1.3*	

Source: EC.
(1) Measured by the HICP.
(2) Measured by the HICP excluding unprocessed food and energy.

Taking the period 1999-2005 as a whole, the underlying inflation trend was below the percentage increase in the GDP deflator, indicating that the impact of import prices on the underlying inflation trend was negative. This effect averaged -0.2 percentage point per annum for the period 1995-2005. Overall, in the present circumstances, the underlying inflation trend does appear to underestimate domestic inflationary pressure. That underestimate is somewhat greater than the overestimate of domestic inflationary pressure which would arise if headline inflation were taken as the basis, since that one was, on average, 0.1 percentage point higher than the GDP deflator over the period considered.

The effect of changes in relative prices generated via the import channel was even more marked in 2005. The upward effect of imported energy is estimated at 0.7 percentage point, whereas the downward effect via imports of manufactured goods came to 0.3 percentage point. In all, this analysis appears to indicate that, over the past six years, the net effect of globalisation on headline inflation measured by the HICP, induced via the movement in

the import prices of both commodities and manufactured goods, was slightly positive at 0.1 percentage point per annum, while in 2005 it was more positive, at 0.4 percentage point. However, these effects are far smaller than those calculated on the basis of the difference between headline inflation and the underlying inflation trend.

A major shortcoming of the proposed analysis is that it takes no account of the effect of globalisation on the prices of domestic value added. However, by comparing the movement in the prices of the various components of the GDP deflator, it is possible to examine how the remuneration of the various production factors has changed. This reveals that, in the euro area, the rise in unit labour costs has systematically lagged behind the movement in the GDP deflator in recent years, pointing to a decline in the share of value added represented by wages. This trend is probably connected with globalisation, since the expansion of the global labour supply in principle depresses the relative price of labour.

An alternative consists in leaving the inflation target unchanged, in view of its crucial role as a nominal anchor, but using it sufficiently flexible, so that there is no automatic response to a deviation between realised inflation and the inflation target. This requires an in-depth analysis of the inflation picture, to permit identification of the more fundamental trend in inflation, disregarding the first-round effects caused by globalisation. For this purpose, the analysis of the risks to price stability should be based on the broadest possible range of information and indicators. This broad analysis is not only an essential foundation for the conduct of monetary policy, it also serves as the basis for communication concerning the policy pursued, so that it helps to ensure that both the nature of the shocks and any deviation between observed inflation and the inflation target are seen in their true light. This should help to safeguard the credibility of the central bank, even if inflation does deviate temporarily from the target.

The findings concerning the flatter Phillips curve and the weaker link between official interest rates and long-term rates suggest that, in recent years, there has been a decline in the effectiveness of monetary policy via the traditional interest rate channel. In fact, a change in inflation requires a larger change in the output gap, which – assuming that output gaps are influenced primarily by long-term interest rates – in turn requires a larger change in the official interest rate.

However, the interpretation need not be so negative. Both the flatter Phillips curve and the weaker link between official interest rates and long-term rates appear to be largely due to the improved conduct of monetary policy and the associated increased credibility of the central bank. Yet this also means that those changes are not necessarily permanent, and could rapidly vanish if monetary policy were to lose its credibility by aiming to over-stimulate economic activity on the assumption that the effect on inflation is limited.

Moreover, there is a possibility that a number of structural changes beyond the influence of the central bank, including globalisation, have played a part in explaining the flattening of the Phillips curve and the severing of the link with the long-term interest rate. Even then, the consequences of weaker transmission via the traditional interest rate channel are not clear-cut. In the first instance, it is mainly cost-push shocks that could give rise to problems, since a flatter Phillips curve implies that demand shocks simultaneously have a smaller inflationary impact than before and require a more modest policy response. Secondly, one of the possible causes of a flatter Phillips curve, namely the diminished extent to which cost factors are passed on in prices, and the associated increase in price rigidity, is in principle only a temporary phenomenon which occurs exclusively during the period when mark-ups are being cut. Once mark-ups have been pruned, the economy should have become more flexible than it was initially. During the transitional phase, this phenomenon also limits the inflationary impact of cost-push shocks. Thirdly, monetary policy can try to strengthen its grip on the long-term interest rate by clear communication regarding the economic and monetary analysis conducted, the risks to price stability and – if deemed appropriate – forthcoming monetary policy decisions (Woodford, 2005). Finally, it must be remembered that there are many other transmission channels not discussed here, and their effectiveness may not have been impaired by globalisation.

Conclusion

Globalisation, which has accelerated sharply since the mid-1990s, has brought some significant economic developments. This article examined three possible effects of globalisation which could be relevant for monetary policy. It also discussed the possible monetary policy implications of the three trends examined.

The low and stable inflation appears to be due to the improved conduct of monetary policy rather than progressive globalisation. However, the integration of the emerging economies is associated with substantial relative price changes. The relative prices of commodities have risen while those of labour-intensive goods have declined. Although, in the longer term, these relative price changes are neutral, in principle, for inflation, they may still present a challenge for monetary policy. In a context of globalisation, it is therefore more necessary than ever for the analysis underlying monetary policy to be based on the broadest possible range of information and indicators, so as to identify the more fundamental risks to price stability, both upward and downward, in due time.

The flattening of the classical Phillips curve observed in the euro area appears to be a global phenomenon which can be explained both by the improved conduct of monetary policy and by structural changes in the industrial economies, including globalisation. A flatter Philips curve suggests that bringing inflation down entails higher short-term costs in terms of output. However, this finding needs to be qualified, since the flatter Phillips curve is due partly to the credible monetary policy, and because the inflationary impact of cost-push shocks is fairly small in the light of stronger international competition.

Partly as a result of global financial integration, long-term interest rates have become more closely aligned at the international level, while there is evidently a weaker link between official interest rates and long-term interest rates. These developments appear to suggest that the traditional interest rate channel has become less effective. That finding, too, needs to be qualified, since the severing of the link with the long-term interest rate is largely due to the firm anchoring of inflation expectations. Moreover, good communication regarding the economic and monetary analyses conducted can provide an additional instrument for steering long-term interest rates.

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