

# SPEECHES, STUDIES AND STATEMENTS

## 1. Unabridged translations

### Inflation persistence in France and the euro area

*Since mid-2000, inflation in the euro area has regularly exceeded the maximum limit set by the Eurosystem in the definition of price stability, i.e. below but close to 2%. This is a worrying situation given that, since 2001, the euro area has experienced not only an economic slowdown – which might have been expected to lead to the easing of inflationary pressures – but also a period of strong appreciation of the nominal effective exchange rate of the euro as from the second half of 2002 – both trends that have a spontaneous disinflationary impact. This paper shows that the high level of inflation may be ascribed to various factors, which include the occurrence of several shocks that affected the euro area economies as well as the intrinsic persistence of inflation, i.e. its tendency to revert slowly to its long-term level due to the rigidity of the transmission mechanisms through which shocks are spread to the economy as a whole.*

*We present a small rational expectations model calibrated on the euro area that aims to clarify the concept of inflation persistence from a theoretical perspective. The more economic agents' expectations depend on future trends and the more responsive monetary policy, the less persistent inflation will be. This paper presents the results of simulations on the NiGEM and Mascotte models in an attempt to quantify inflation persistence. It highlights the fact that the disinflationary impact of the appreciation of the euro outweighed the inflationary effect of the recent rise in oil prices – provided that the shock transmission mechanisms were complete. By contrast, at the domestic level, weak productivity gains, notably in service activities, partly account for the significant inflation persistence in France and the euro area. Shocks on regulated prices and indirect taxes also contributed significantly to the growth in prices.*

*The impact of these inflationary shocks has been amplified by the existence of substantial lags in price setting behaviour, which have contributed to increasing inflation persistence, as prices responded to temporary shocks somewhat sluggishly. This property is illustrated by*

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NB: The authors would like to thank M. Baghli, L.-M. de Belleville and J.-P. Villetelle for their contributions to this article.

*the two examples provided for France in 2003: firstly, production prices (value added prices) in 2003 continued to reflect the decline in labour productivity in 2001-2002 and, secondly, the appreciation of the euro passed through only slowly to consumer prices as a result of the rebuilding of importers' margins.*

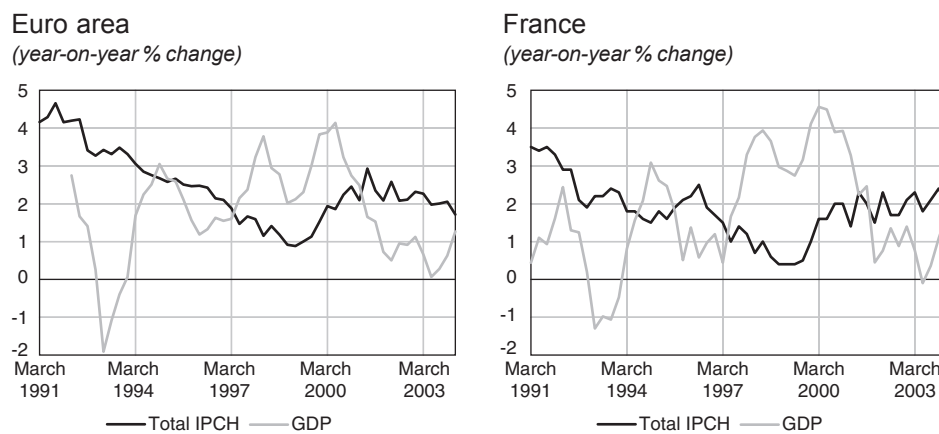
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## 1. Introduction

With respect to the Eurosystem's objective of achieving an inflation rate – measured by the year-on-year increase in the Harmonised Index of Consumer Prices (HICP) – below but close to 2% over the medium term, it has to be recognised that there is a degree of inflation stickiness in the euro area: during most of the June 2000 to May 2004 period, the year-on-year increase in the euro area HICP reached or exceeded 2%, only dropping temporarily below this level one month out of six on average. This situation is all the more worrying given that since 2001 the euro area economies have experienced a marked economic slowdown that should have resulted in an easing of inflationary pressures, and that since the end of 2002, there has been a strong appreciation of the euro nominal effective exchange rate, the spontaneous effect of which is disinflationary. The case of France was perhaps even more marked, since the inflation differential with the euro area, which had been negative up to 2002 – France's inflation was lower than the euro area's – has reversed since the beginning of 2003.<sup>1</sup> Chart 1 below highlights a scissor effect in this regard: in contrast to the end of the 1990s, the hallmarks of which were strong growth and low inflation, the 2001-2003 period was characterised by low growth and rising inflation. The same kind of phenomenon is observed if one looks at the HICP excluding energy and unprocessed food.

**Chart 1**  
**Year-on-year increase in GDP and quarterly HICP**



Sources: Eurostat, INSEE

We need therefore – especially from a monetary policy perspective – to investigate the causes of the persistence observed in the inflation rate. Two major types of explanation are possible: according to the first, the European economy has been subjected to a series of adverse “shocks” that are external in nature (increases in oil and commodities prices) or else domestic (shocks on regulated prices and indirect taxes, changes in economic agents' expectations with an inflationary bias resulting from the blurring of their scale of values following the changeover to the euro); the second points to the fact that macroeconomic shock transmission mechanisms, in particular price setting behaviour, are slow, which is a potential source of “intrinsic” inflation persistence.

<sup>1</sup> See the editorial in the Banque de France's December 2003 *Bulletin*.

Intrinsic inflation persistence is defined as the tendency of inflation, following a temporary inflationary shock, to return only slowly to its equilibrium level, which may correspond to the level of inflation that the central bank is seeking to achieve. As has been shown by Levin and Piger (2002) in the case of the United States, the occurrence of significant shocks affecting the US economy or shifts in the monetary policy regime have sometimes led to the – erroneous – conclusion that persistence is growing. That is why it is important to analyse simultaneously the shocks that have affected the economy and the latter's reaction to them, since high persistence may derive from the existence of rigidities in the formation of agents' expectations or in price or wage setting behaviour.

The first part shows that the external shocks that have affected the euro area economy over the past few years are not sufficient to account for inflation remaining at a high level. The second part suggests that the latter is largely the result, both in France and the euro area, of rises in indirect taxes and regulated prices. The final part examines more particularly the transmission mechanisms of the shocks affecting the French economy and shows that current inflation persistence is consistent with economic agents' usual behaviour estimated for France, which is characterised by a great slowness to adjust to shocks.

## **2. A modelling approach to external shocks**

First of all, a stylised and calibrated model of the euro area is used to assess the impact of lags in the pass-through of the shocks that may affect price developments in France and the euro area. This model makes it possible to illustrate the effects of the structural characteristics of the economy, particularly with regard to the formation of expectations and the responses of monetary policy. The short-term results of variants produced using econometric models, estimated on the basis of statistical data for the euro area, are subsequently presented. The models used are NiGEM<sup>2</sup> and Mascotte, the Banque de France's quarterly forecasting model.<sup>3</sup> The results permit us to conclude that the external shocks that have affected the euro area have been substantial but are not sufficient to explain current inflation persistence.

### **2.1. Conclusions drawn from a stylised model of the euro area**

In order to identify the link between structural characteristics of the economy and responses to external shocks, a stylised model with rational expectations is used. The model comprises a small number of price formation equations in an open economy, with a supply and demand curve including agents' expectations (wages and companies) and a monetary policy reaction function (see Box 1). Most of the equations in the model reflect inertia in behaviour that influences lags in the transmission of shocks.

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<sup>2</sup> NiGEM – the National Institute Global Econometric Model – is the multinational macroeconomic modelling software managed by the National Institute of Econometric and Social Research (NIESR) in London. The version used for these simulations is that of 2004.

<sup>3</sup> See Baghli *et al.* (2003, 2004).

## Box 1

**A theoretical open-economy model**

The open-economy rational expectations model, derived from Batini and Haldan's model (1999), illustrates the determinants of inflation persistence.<sup>1</sup>

The model is essentially made up of a Phillips curve and a dynamic IS curve extended to an open economy. It comprises the following equations:

$$(1) \quad Y_t = \alpha_1 Y_{t-1} + \alpha_2 E_t Y_{t+1} - \alpha_3 (i_t - E_t \pi_{t+1}) - \alpha_4 (p_t^d - p_t^{d*} - e_t) + e_t^y$$

$$(2) \quad \pi_t^d = \beta_1^d \pi_{t-1}^d + \beta_2^d E_t \pi_{t+1}^d + \beta_3^d (w_t - p_t^d + p_t + \gamma_t) + e_t^{\pi d}$$

$$(3) \quad \pi_t^w = \beta_1^w \pi_{t-1}^w + \beta_2^w E_t \pi_{t+1}^w + \beta_3^w (\alpha y_t - w_t) + e_t^{\pi w}$$

$$(4) \quad \pi_t^f = \beta_1^f \pi_{t-1}^f + \beta_2^f E_t \pi_{t+1}^f + \beta_3^f (p_t^{f*} + e_t - p_t^f) + e_t^{\pi f}$$

$$(5) \quad \pi_t = (1 - \delta) \pi_t^d + \delta \pi_t^f$$

$$(6) \quad i_t = a i_{t-1} + (1 - a) (a_\pi \pi_t + a_y y_t)$$

$$(7) \quad E_t e_{t+1} = e_t + i_t - i_t^* - e_t^{\pi p}$$

The variables are expressed as a differential, a percentage or as a percentage point at the equilibrium trajectory. The variables  $y_t$ ,  $\pi_t$ ,  $\pi_t^d$ ,  $\pi_t^f$ ,  $\pi_t^w$ ,  $i_t$ ,  $i_t^*$ ,  $e_t$  designate in turn the output gap, inflation (growth in consumer prices), growth in value added prices, growth in import prices, wage growth, domestic and foreign nominal interest rates, and the exchange rate (the dollar's value expressed in euro) respectively. The terms  $p_t$ ,  $p_t^d$ ,  $p_t^f$ ,  $p_t^{d*}$ ,  $p_t^{f*}$  are logs of consumer prices, value added prices, import prices, euro area export prices and those of its competitors – both expressed in foreign currency – while  $w_t$  is the log of real wages (deflated by consumer prices). The terms  $e_t^y$ ,  $e_t^{\pi d}$ ,  $e_t^{\pi f}$ ,  $e_t^{\pi w}$  and  $e_t^{\pi p}$  are autocorrelated shocks.

The first equation describes demand behaviour. It constitutes a "prospective" IS curve linking the output gap to the real interest rate and the real exchange rate (the inclusion of this latter variable reflects the price elasticity of exports). The second equation represents the supply variables and constitutes a "new Phillips curve" describing the formation of producer prices, with producers setting their prices according to marginal costs, based on the assumption of inertia in terms of prices and rational expectations. The third equation describes the change in nominal wages, which gradually adjust to a target value and are also determined by the output gap. The two subsequent equations represent the other price indicators: import prices gradually adjust to the value of the marginal cost, in this case the good's price – converted into euro – on the global market. The incomplete pass-through of exchange rate fluctuations is reflected in stickiness in import prices relative to the real exchange rate. Over the long term, the pass-through is complete and the equilibrium real exchange is fixed. The fifth equation defines the consumer price index on an accounting basis as the weighted sum of domestic prices and import prices, according to the share of imports in GDP. Finally, the last two equations describe the money market and the foreign exchange market. The sixth equation expresses the monetary policy reaction function, according to which the central bank responds to inflation and the output gap while smoothing interest rates. The seventh equation introduces the rule of uncovered interest rate parity as a determinant of the exchange rate, taking account of a risk premium.

Source: Le Bihan, Matheron (2004)

<sup>1</sup> See also Svensson (2000), McCallum and Nelson (2000), Smets and Wouters (2002).

The model makes it possible to identify inflation persistence. To this end, Table 1 in Box 2 provides an indicator of persistence obtained using simulations in the model, under different configurations of the parameters. The model is simulated either with adaptive expectations (*i.e.* they are also based on past developments) or with expectations based on future developments. Likewise, the model is simulated by assuming either a responsive monetary policy or an accommodating one (the first differs from the second by virtue of a higher coefficient associated with inflation in the central bank's reaction function). It clearly emerges from this that the more expectations are adaptive and the more monetary policy is accommodating, the more persistent inflation is. Conversely, the more economic agents' expectations incorporate future developments and the more responsive monetary policy is, the lower the persistence. In all of the configurations looked at, inflation displays relatively high persistence. The model incorporates many sources of rigidity, both nominal (such as the degree of price inertia) and real (such as the weak response of wages to the economic situation). We should therefore expect a protracted effect from the different shocks that appear in the economy.

The model illustrates that inflation can display a degree of persistence in the sense that it returns slowly to its reference level having been subjected to shocks. However, it does not lend itself to a refined analysis of shocks that have actually occurred. Consequently, in the remainder of the study, the analysis is based on the NiGEM and Mascotte macroeconomic models.

Box 2

**Measuring inflation persistence**

The model presented in Box 1 is calibrated to reflect the euro area economy at a quarterly frequency. In the reference version of the model, the parameters were chosen in the following manner. Given the great diversity of econometric results involving them, the parameters describing the weight of future and past terms in the inflation and IS curve equations, are set at 0.5 (i.e.  $\alpha_1 = \alpha_2 = 0.5$ , and  $\beta_1^f = \beta_2^f = 0.5$  for  $i = d, f, w$ ). Moreover, standard benchmarking of models with underlying microeconomic foundations on equations (1) – (4) gives  $\alpha_3 = 0.5$ ,  $\alpha_4 = 0.05$ ,  $\beta_3^f = 0.37$ ,  $\beta_3^d = 0.015$ ,  $\beta_3^w = 0.035$ ,  $\gamma = 1$  and  $\alpha = 0.20$ . Parameter  $\delta = 0.15$  reflects the share of extra-euro area imports in the euro area's GDP. The parameters of the reaction function are  $a_i = 0.4$ ,  $a_p = 1.5$ ,  $a_y = 0.10$ , in order to incorporate a stabilisation objective for inflation (and possibly for production) and interest rate smoothing.<sup>1</sup>

**Table 1: Indicators of inflation persistence according to characteristics of the economy**

Characteristics of model	Inflation persistence (sum of autoregressive coefficients)	Standard deviation of inflation
Reference model	0.93	1.00
Model with expectations based largely on the future	0.87	0.58
Model with adaptive expectations	0.96	1.06
Responsive monetary policy	0.88	0.46
Accommodating monetary policy	0.96	2.00

*NB: The standard deviation of inflation is normalised at 1 in the reference model. In statistical terms, persistence can be measured by the sum of lagged inflation coefficients in an autoregressive model of the type  $\pi_t = \mu_0 + \mu_1\pi_{t-1} + \mu_2\pi_{t-2} + \dots + \mu_p\pi_{t-p} + \varepsilon_t$ , soit  $\rho = \mu_1 + \mu_2 + \dots + \mu_p$ . The greater  $p$  is, the more shocks have a lasting effect and the higher the persistence.*

*Table 1 illustrates this phenomenon by providing an indicator of persistence when the model is simulated either with more adaptive expectations ( $\beta_1^d = \beta_1^w = 0.75$  et  $\beta_2^d = \beta_2^w = 0.25$ ) or on the basis of future expectations ( $\beta_1^d = \beta_1^w = 0.25$  et  $\beta_2^d = \beta_2^w = 0.75$ ). Similarly, the model is simulated assuming a responsive monetary policy ( $a_i = 0.4$ ,  $a_\pi = 3$ ,  $a_y = 0.10$ ) and an accommodating one ( $a_i = 0.4$ ,  $a_\pi = 1.1$ ,  $a_y = 0.10$ ). Persistence variances and coefficients are obtained using the calibration  $\sigma^y = 0.01$ ,  $\sigma^{\pi^d} = 0.001$ ,  $\sigma^{\pi^f} = 0.005$ ,  $\sigma^{\pi^w} = 0.001$  et  $\sigma^{\pi^p} = 0.01$  and the autocorrelation coefficients are  $\rho^y = 0.8$ ,  $\rho^{\pi^d} = 0.6$ ,  $\rho^{\pi^f} = 0.6$ ,  $\rho^{\pi^w} = 0.6$  et  $\rho^{\pi^p} = 0.5$ .*

Source: Le Bihan and Matheron (2004)

<sup>1</sup> These values are common in the literature. It should be pointed out that inflation and the interest rate are expressed as quarterly rates.

## 2.2. Conclusions drawn from the forecasting models

The NiGEM model for the euro area and the Mascotte model for France make it possible to quantify the response to the external shocks that have occurred over the past few years. Between Q2 2002 and the end of 2003, a strong appreciation of the nominal effective exchange rate of the euro – mainly reflecting the euro’s appreciation against the US dollar – and an average rise in the dollar price of crude oil were observed simultaneously. Since the beginning of 2004, dollar-denominated oil prices have again risen sharply, reaching about USD 36 dollars a barrel in Q2 2004.

On the basis of simulations carried out using the multinational NiGEM model, it is possible to compare the path of the euro area HICP in 2003 and early 2004 with the notional path that would have been observed in the absence of movements on the foreign exchange and oil markets. This notional path is obtained by supposing that the price of crude oil as well as the euro and sterling exchange rates against the dollar had remained constant since Q2 2002, at USD 25, USD 0.94 and USD 1.48 respectively (see Chart 2).

According to the simulations, the simultaneous developments in the oil price and the euro exchange rate relative to levels in Q2 2002 were overall disinflationary: they contributed to lowering inflation by 1.3 percentage points at the end of 2003. All in all, the inflationary “oil” effect only therefore offset the disinflationary “exchange rate” effect to a small degree.

The inclusion of Q2 2004, during which the euro exchange rate more or less stabilised and the price of oil increased by a further USD 5 a barrel, would reduce this impact somewhat.

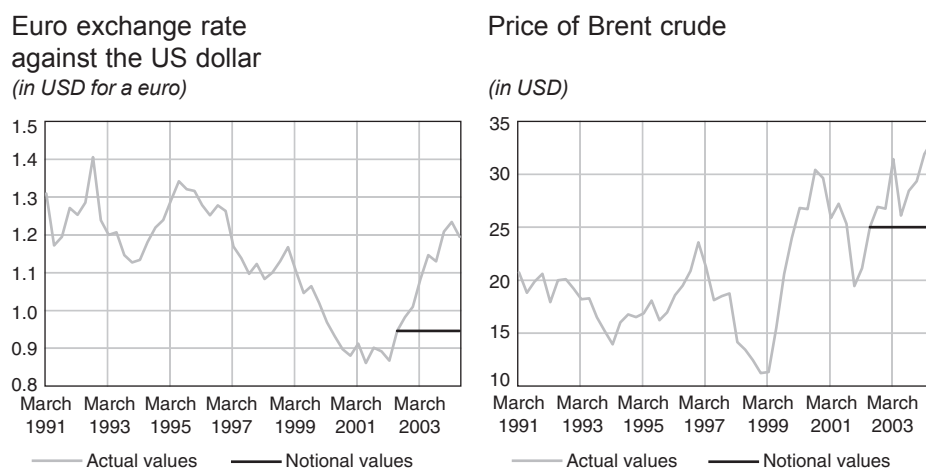
*Table 2*  
**Year-on-year increase in the euro area HICP, impact of exchange rate and oil price movements since Q2 2002**

	<i>(deviation in percentage points from baseline)</i>						
	2002 Q3	2002 Q4	2003 Q1	2003 Q2	2003 Q3	2003 Q4	2004 Q1
“Exchange rate” effect	-0.08	0.20	- 0.46	-0.87	- 1.11	-1.38	1.62
“Oil effect”	0.03	0.06	0.16	0.15	0.09	0.08	0.01
<b>Total</b>	<b>-0.05</b>	<b>-0.14</b>	<b>- 0.31</b>	<b>-0.72</b>	<b>- 1.02</b>	<b>-1.30</b>	<b>-1.60</b>

*NB: The rise in the price of crude oil contributed to 0.15 percentage point to the inflation rate, measured as the year-on-year increase in the HICP, in the second quarter of 2003 (the “oil” effect). Simultaneously, the appreciation of the euro and the pound sterling shaved 0.87 percentage point from the year-on-year increase in the HICP in Q2 2003 (the “exchange rate” effect).<sup>4</sup> Taken together, in Q2 2003, the appreciation of the euro and of the pound sterling and the increase in the price of Brent crude dampened the year-on-year increase in the HICP by 0.72 percentage point.*

<sup>4</sup> All other things being equal, the effects of the pound’s appreciation are inflationary over the short term for prices in the euro area, *via* rises in the price of imports from the United Kingdom, according to simulations carried out using the NiGEM model. With respect to the period under review, these effects have offset – to a small extent – the disinflationary effects of the euro appreciation.

**Chart 2**  
**Conventional exchange rate and oil price assumptions used in simulations**



We can therefore estimate that, if the price of crude oil and the euro exchange rate had stabilised after Q2 2002, the year-on-year increase in the HICP for the euro area would have been – all other things being equal – 3.4 % in Q4 2003 and 3.3% in Q1 2004, instead of the 2.1% and 1.7% recorded.

Mascotte produces similar results for France:<sup>5</sup> the euro appreciation would have resulted, all other things being equal, in a fall in the year-on-year HICP of 1.2 percentage points at the end of 2003 and of 1.4 percentage points in Q1 2004. This would have been partially offset by the effect on the year-on-year appreciation of the oil price, which amounted to 0.2 percentage point at the end of 2003 and 0.1 percentage point in Q1 2004.

**Table 3**  
**Year-on-year increase in France's HICP: contribution of shocks since Q2 2002**

	<i>(deviation in percentage points from the baseline)</i>						
	2002	2002	2003	2003	2003	2003	2004
	Q3	Q4	Q1	Q2	Q3	Q4	Q1
"Exchange rate" effect	-0.06	-0.15	-0.36	-0.68	-0.90	-1.19	-1.42
"Oil" effect	0.08	0.13	0.33	0.26	0.18	0.19	0.07
<b>Total</b>	<b>0.02</b>	<b>-0.02</b>	<b>-0.02</b>	<b>-0.42</b>	<b>-0.72</b>	<b>-1.00</b>	<b>-1.36</b>

The impact of these shocks needs to be put into perspective, given the relatively erratic nature of oil prices: the effect for 2003 and 2004 would be more marked if the benchmark of USD 20 a barrel, the level reached in Q4 2001, were used. Thus, according to Mascotte and NiGEM, the total effect on the year-on-year HICP after one year of a permanent 25% increase in the price of oil (USD 25 a barrel, compared with USD 20) amounts to 0.5 percentage point for France (a 10% shock has an

<sup>5</sup> The slight discrepancy between the simulations for France and the euro area can above all be ascribed to the fact that NiGEM is a multinational model incorporating the indirect effects of shocks on import prices whereas the variant produced using Mascotte, even if it is derived from simulations of the NiGEM model, only takes partial account of them. Monetary policy is exogenous in the two cases.

impact of the order of 0.2 percentage point – see Table 4) and 0.28 percentage point in the euro area (a 10% shock has an impact of the order of 0.11 percentage point). This does not, however, undermine the assessment that oil price shocks are not sufficient to explain recent inflation dynamics.

*Table 4*

**Impact at a one-year horizon on inflation of a permanent oil price shock according to different econometric models**

Assumption of a 10% rise in the dollar oil price

	<i>(in percentage point)</i>
	Impact after four quarters on the year-one-year increase in the HICP
<b>Euro area</b>	
NiGEM	0.11
Multimod	0.26
<b>France</b>	
NiGEM	0.16
Mascotte	0.20

### 3. The role of domestic variables

In the wake of the shocks that have affected the euro area countries over the past few years, the price-setting behaviour of producers and suppliers, as well as unit labour costs, are potential candidates for explaining the high level of inflation persistence.

In fact, domestic margins increased in the euro area in early 2003 and tended to deteriorate in France. On the other hand, the decline in productivity gains has brought about a marked increase in unit labour costs and consequently a rise in prices in the services sector. The most substantial shock, however, derives from increases in indirect taxes and administered prices.

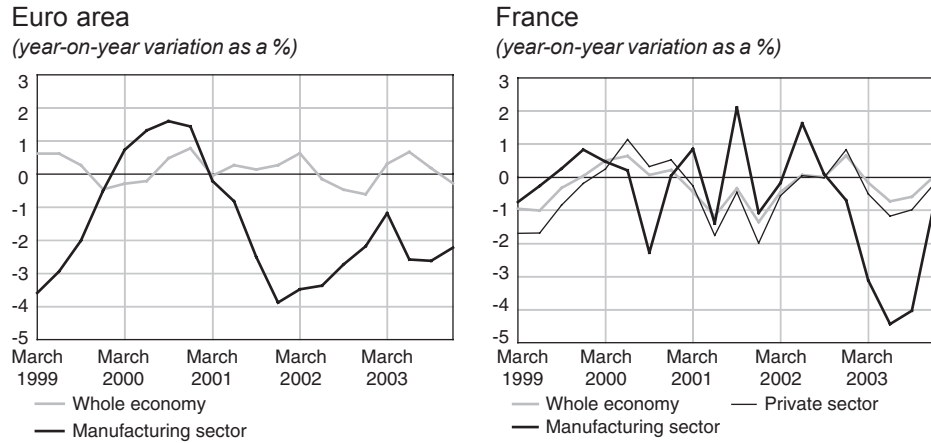
#### 3.1. Declining domestic margins

As is indicated by Chart 3, domestic margins (as a ratio of value added prices to unit labour costs – ULC<sup>6</sup>), which had declined since 2001, increased slightly in the euro area during the first three quarters of 2003. In the manufacturing sector, the fall in domestic margins that had started in 2001 and 2002 continued in 2003.

As regards France, irrespective of whether margins are measured for the economy as a whole (as a ratio of GDP price to unit labour costs), the productive sector or the manufacturing sector alone (as a ratio of value added price to ULC in the corporate or manufacturing sectors), their year-on-year variation is negative, whereas they had climbed strongly in 1999-2000. Thus, over the recent period margins have been “procyclical” and their variation does not therefore help to explain inflation persistence.

<sup>6</sup> ULC are calculated as a ratio of nominal per capita labour costs to per capita labour productivity.

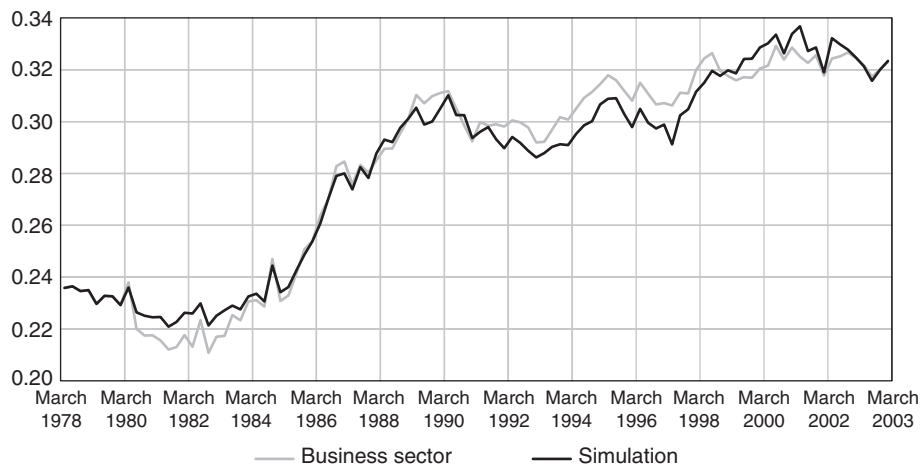
**Chart 3**  
**Margins on unit labour costs**  
 Value added price/unit labour cost ratio



Sources: Eurostat, INSEE, Banque de France calculations

These usual profit margin developments in France are, moreover, confirmed by the simulation of a reduced form profit margin equation in the productive sector<sup>7</sup> (Baghli, Cette, Sylvain, 2003), the determinants of which are the capacity utilisation rate, the oil price, and average real short and long-term interest rates. Over the years 2002-2003, the simulation is perfectly in line with actual developments and therefore confirms the lack of change in companies' price-setting behaviour.

**Chart 4**  
**Profit margins in France's productive sector**



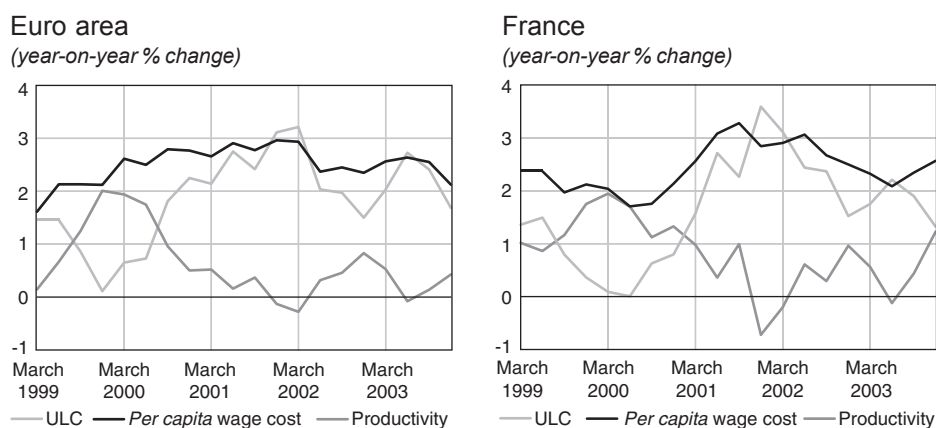
Source: Baghli, Cette, Sylvain (2003), updated by the Banque de France's Macroeconomic Analysis and Forecasts Division

<sup>7</sup> This comprises non-financial corporations, sole traders and financial corporations.

### 3.2. Unit labour costs in services

The economic slowdown in 2001-2003 was accompanied by a sharp rise in unit labour costs both in France and the euro area. As is shown by Chart 5, this acceleration in unit labour costs (measured as the ratio of the *per capita* labour cost to *per capita* labour productivity) is attributable to the decline in productivity gains, which remained very low in 2002 and 2003 both in France and the euro area. At the same time, *per capita* wages were relatively rigid downwards, continuing to grow at a steady rate of around 2.5% a year both in France and the euro area. This rigidity may lead us to wonder whether there has been a decoupling of the short-run inverse relationship between the unemployment rate and wage growth. Indeed, the previous situation had already been characterised by a degree of wage moderation in the euro area, reflecting the situation in France and Germany. In France, wage moderation was linked to the adoption of collective agreements within the framework of the reduction of the working week.<sup>8</sup> In Germany, efforts to moderate wages in the latter half of the 1990s helped to curb the rise in unit labour costs following the two-fold shock caused by reunification on labour productivity (downwards) and *per capita* wage costs (upwards). It is possible that the corollary to efforts to moderate wages agreed on by the different partners in the euro area has been a certain amount of wage stickiness over the recent period in a less favourable employment environment.

**Chart 5**  
**Breakdown of ULC in the economy as a whole:**  
***per capita* wage cost and productivity**

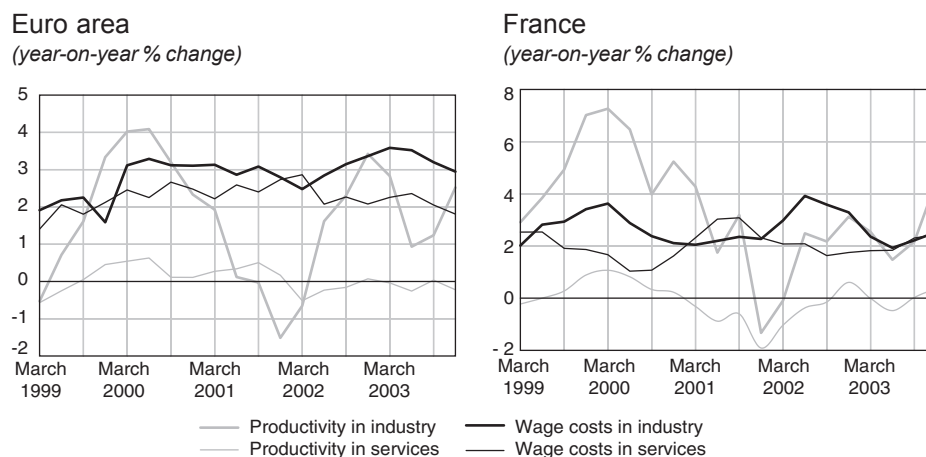


Sources: Eurostat, INSEE

As is indicated by Chart 6, low productivity gains have been observed above all in the services sector with – both in France and the euro area – a virtual absence of annual gains since 2001.

<sup>8</sup> In this respect, the equation for employee compensation (wages + *per capita* social security contributions) in the Mascotte model, estimated up to the end of 2001, *i.e.* including the years in which the reduction of the working week was introduced, tends to overestimate growth in *per capita* compensation as of 2002. The same phenomenon of overestimating wages is found in Gallot and Heitz (2004) for France.

**Chart 6**  
**Growth in *per capita* wage costs and productivity**  
**in the manufacturing and services sectors**



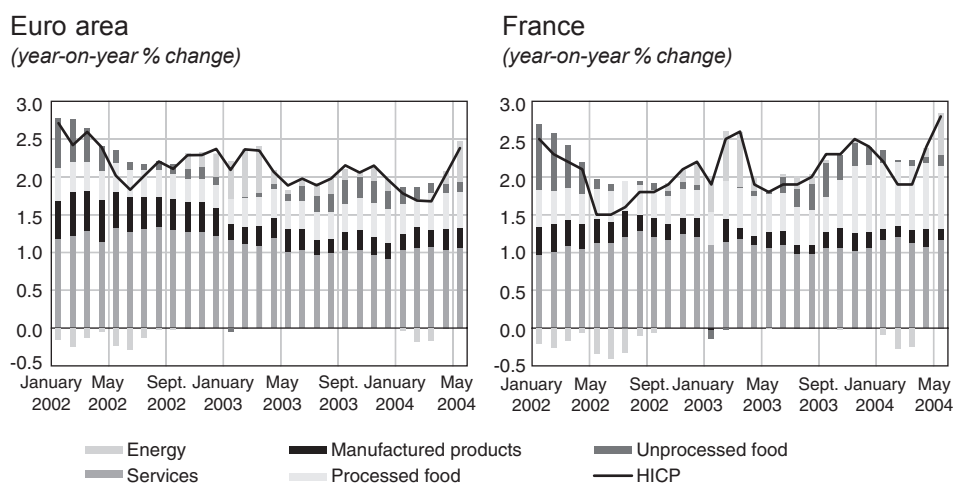
Sources: Eurostat and INSEE, Banque de France calculations

*NB: The distinction between the manufacturing and services sectors is however tenuous. In particular, employment in services includes employees in temporary employment sector, while part of the value added produced is recorded in the manufacturing sector, which accentuates the productivity differential between manufacturing and services.*

The differential in productivity gains between the manufacturing sector and the market services sector has contributed to the stronger growth in prices in the latter. Furthermore, the degree of international competition is lower in many market services than in the manufacturing sector. As a result of the relatively large share of household consumption accounted for by services (40% in the euro area and 41% in France in 2003), and systematically higher inflation than in other sectors, services contributed nearly 50% to the year-on-year change in the total HICP (50% in the euro area and 49% in France in 2003): out of the 2 to 2.5 percentage points of annual inflation since 2001, between 1 and 1.5 percentage points are accounted for by the services sector alone.<sup>9</sup> The relatively sharp rise in prices in this sector therefore appears to contribute in part to keeping inflation at high levels.

<sup>9</sup> Services prices' major contribution to total inflation is felt by households, which tend to give excessive weight to services in their perception of inflation (see Derambure, 2004, for France). This, in turn, would weigh on prices if households were to adjust their wage claims accordingly.

**Chart 7**  
**Contribution of different sectors to the year-on-year change in the HICP**



Sources: Eurostat, INSEE, Banque de France calculations

### 3.3. The role of indirect taxes and regulated prices

Over the shorter term, *i.e.* in 2002-2003, the greatest inflationary shock for the euro area has been the upward adjustment in regulated prices and indirect taxes in several countries. In particular, this shock took the form of the phasing-out of the reimbursement of certain medical expenses – which can be regarded as regulated prices – and higher excises on tobacco in France and Germany (2% of the price index).

In France more specifically, the impact of the new measures was moderate up to 2002, as some of them consisted in fact of tax cuts (reductions in the domestic tax on petroleum products in early 2001). However, measures to increase indirect taxes (essentially tobacco and energy), together with the phasing-out of the reimbursement of certain medicines as of spring 2003, made a substantial contribution to the formation of annual inflation (nearly 0.7 percentage point up to October 2003). The inflationary effects of these shocks should however be temporary, unless the increases feed through into wages, which in turn weigh on prices (“second round effects”).

To measure the mechanical impact of these changes in the euro area, we draw on two sources. As regards administered prices, we use the European Central Bank’s estimates for 2002 and 2003 measuring the year-on-year change in the relevant items, which represent 5.6% of household consumption.<sup>10</sup> We update these data as far as June 2004, which reveals that the main change in regulated prices in 2004

<sup>10</sup> See European Central Bank, *Monthly Bulletin*, January 2004.

has been the phasing-out of the reimbursement of medical expenses in Germany (see Box 3). As regards indirect taxes, we provide our own estimate based on measures recorded from 2002 to 2004 in the five major euro area countries (France, Germany, Italy, Netherlands and Spain).

## Box 3

**Some examples of rises in regulated prices and excise taxes  
(contribution to the year-on-year increase in euro area inflation)**

**2002:**

- Germany: increase in taxes on tobacco on 1 January 2002 (0.04 percentage point)
- France: abolition of the floating domestic tax on petroleum products on 1 July 2002 (0.02 percentage point)

**2003:**

- Germany: increase in taxes on petrol, electricity, gas and tobacco in January 2003 (0.1 percentage point)
- France: increase in taxes on tobacco in January and October 2003 (0.13 percentage point)
- Italy: increase in taxes on tobacco in April 2003 (0.03 percentage point)

**2004:**

- Germany: phasing-out of reimbursement of health care services in January 2004 (0.2 percentage point) and increase of taxes on tobacco in March 2004 (0.08 percentage point)
- France: increase in taxes on tobacco in January 2004 (0.04 percentage point)
- Netherlands: reduction of health care coverage in January 2004 (0.02 percentage point)

All of these measures have had a substantial cumulative effect on the euro area. According to our calculations, the mechanical impact of these indirect taxes on the year-on-year increase in the euro area HICP amounts to 0.11 percentage point for 2002 and 0.29 percentage point for 2003 (see Table 5). However, this assessment probably underestimates the scale of the effects of these indirect taxes. First of all – in the absence of a sufficiently detailed breakdown of the HICP – it has not been possible to quantify the impact of certain taxes.<sup>11</sup> Secondly, we have limited ourselves to the five countries listed above. Lastly, the method of calculation only takes account of the direct and instantaneous effect. It therefore ignores the indirect and lagged effects that are passed on *via* wage formation and agents' expectations.

<sup>11</sup> This is notably the case for town-gas in Spain in 2003, the reform of the health service in Italy in 2002, and measures to promote renewable sources of energy in Germany in 2003.

**Table 5**  
**Mechanical impact of regulated prices and indirect taxes**  
**on the year-on-year increase in the HICP**

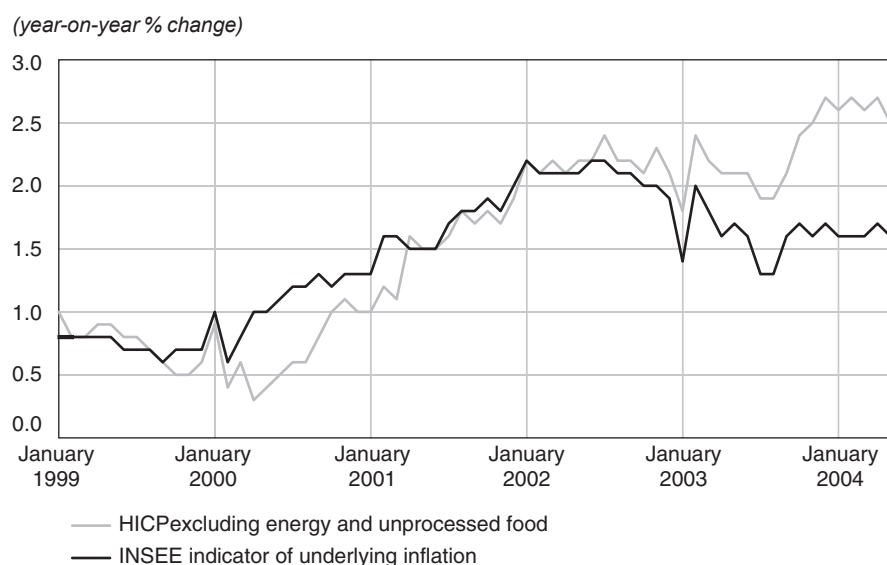
	Euro area			France		
	Regulated prices	Indirect taxes	Total	Regulated prices	Indirect taxes	Total
December 2002	0.18	0.11	0.29	0.10	0.29	0.39
December 2003	0.16	0.29	0.35	0.13	0.61	0.74
June 2004 (p)	0.20	0.14	0.34	0.11	0.61	0.72

(p): Banque de France estimate for 2004

Sources: Banque de France, except for the “euro area, regulated prices” column, which is taken from the ECB’s *Monthly Bulletin*, January 2004

In the case of France, the scale of the upward adjustments of regulated prices and excise taxes can be seen in the discrepancy between the HICP excluding energy and unprocessed food and the indicator of inflation compiled by INSEE on the national index of consumer prices (excluding regulated prices and excise taxes): the year-on-year increase in the former reached 2.5%-2.7% in Q1 2004, compared with 1.5%-1.7% for the latter.

**Chart 8**  
**HICP excluding energy and unprocessed food and INSEE’s national index adjusted for tax measures, excluding regulated and volatile prices**



Source: INSEE

#### 4. The role of adjustment lags: the example of France

To complete the assessment of inflation persistence, we go on to look at price-setting behaviour in France *via* an analysis of the contributions of certain equations in the Mascotte model.<sup>12</sup> This analysis is confined to the equation for the setting of domestic supply prices – total value added prices – and that for prices of imported goods excluding energy. It highlights the adjustment lags in the setting of prices. These lags

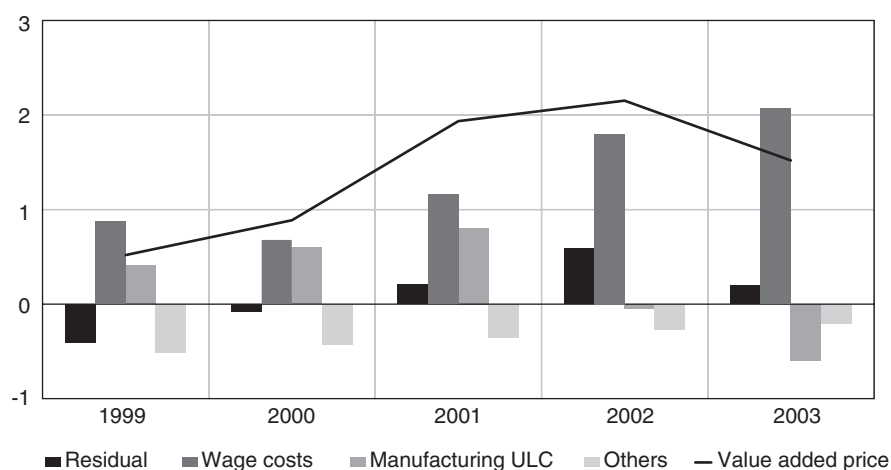
<sup>12</sup> See Baghli *et al.* (2003) and Baghli *et al.* (2004).

mean that past shocks that have affected the French economy continue to have an impact on current inflation, which goes some way towards explaining the high inflation persistence.

#### 4.1. Lagged impact of unit labour costs on value added prices

The value added price equation used in the Mascotte model is specified in terms of an error correction relative to an equilibrium defined by long-term stability of the share of wages in value added. Nevertheless, the short-term variations in unit labour costs are not immediately reflected in prices on account of the sharp fluctuations in productivity. In fact, wages and prices display the same inertia as prices. Thus, as in many models,<sup>13</sup> the value added price equation includes actual wages as an explanatory variable, but productivity is smoothed for the last two years. All in all, variation in the value added price is therefore strongly dependent on past productivity. As is indicated by Chart 9, which shows the dynamic contributions to growth of the different explanatory variables of value added prices, the estimation residual is fairly low. At the same time, smoothed unit labour costs contributed nearly 2 percentage points to the increase in value added prices in 2003, as a result of the sharp slowdown in productivity as of 2001 (see Chart 5 above). The capacity utilisation rate, on the other hand, shaved off 0.4 percentage point, as a result of the slowdown in economic activity, but its weight was insufficient to significantly dampen the growth in value added prices.

**Chart 9**  
**Contribution of explanatory variables to average growth in the value added price**



For each year, average growth of the dependent variable, here the value added price, is broken down into its different dependent variables, including the estimation error (first column, in dark blue) and the dynamic terms (notably the initial values, last column in grey). Each column corresponds – by adding together the current and lagged effects – to the product of the coefficient associated with the explanatory variable in the equation via the average growth in the variable concerned. For example, in 2002, the variation in unit labour costs accounted for – all other things being equal – 1.8 percentage point of the 2.1% growth in value added prices.

Source: Banque de France (Mascotte)

<sup>13</sup> See in particular the European Central Bank's euro area model in Fagan *et al.* (2001).

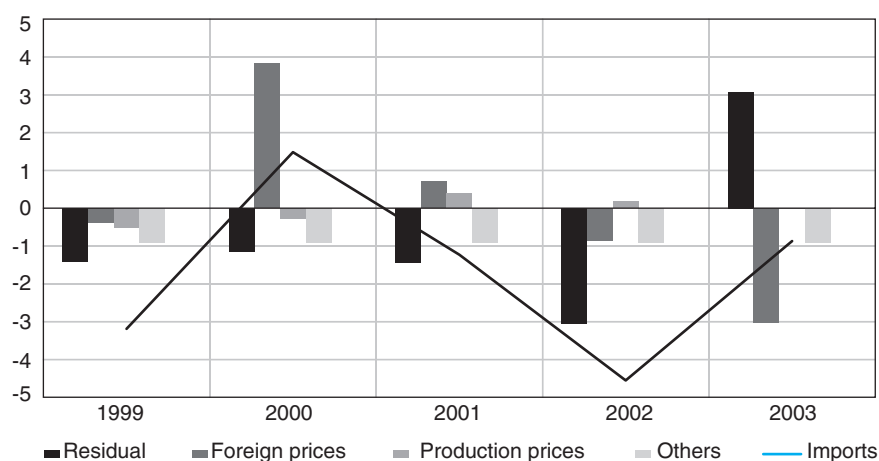
## 4.2. Import prices and exchange rates

The equation for prices of imported goods excluding energy is also defined in terms of an error correction relative to a target that depends both on domestic prices and competitors' prices: foreign suppliers' margin behaviour leads them to vary their prices according to the prices charged on the domestic market and the average prices obtained across their export market as a whole (these are "competitors' prices" denominated in euro). In the case of the appreciation of the euro, for example, suppliers' prices are mechanically revised downwards and import prices are also gradually adjusted downwards.

As is indicated by Chart 10, the Mascotte equation displays good properties, but tends to illustrate average behaviour. It does not, for example, capture the abrupt changes in the exchange rate. Thus, the equation overestimates import prices for 2002, whereas it underestimates them for 2003 (the residual is very positive when the euro exchange rate recovers). In 2003, the high level of import prices would mean that suppliers sought to take advantage of inflation persistence (*i.e.* of high domestic prices) to maintain their prices and increase their margins over and above their usual practice. If one goes by previous patterns, however, improved margins on imported goods in 2003 should be merely a temporary phenomenon: import prices should converge with competitors' euro-denominated prices.

Chart 10

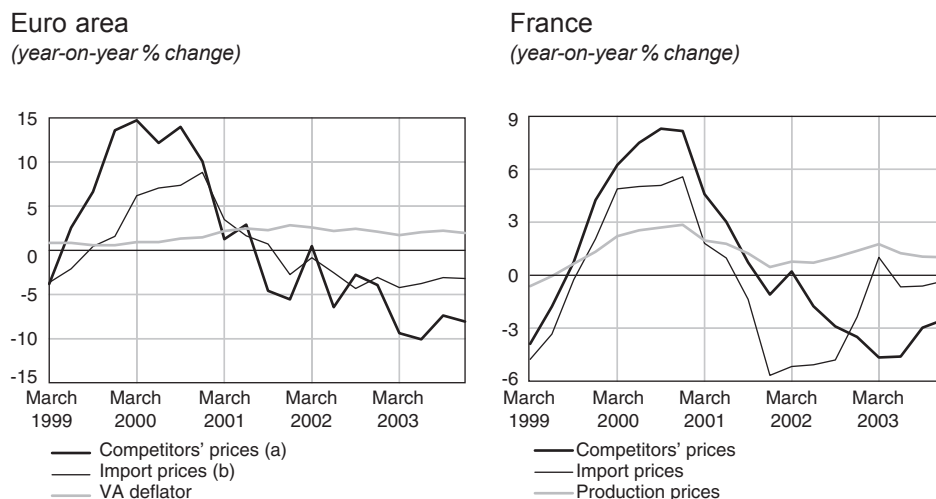
### Contribution of explanatory variables to average growth in prices of imported goods excluding energy



Source: Banque de France (Mascotte)

The strong correlation between import prices and competitors' prices also emerges from Chart 11: the year-on-year change in import prices is generally situated between that for competitors and that for domestic prices, both for the euro area and for France. They are therefore expressed as a weighted average of domestic and foreign prices.

**Chart 11**  
**Import prices, competitors' prices, domestic prices**



Sources: Eurostat, INSEE, Banque de France calculations

(a) Deflator of extra-euro area imports of goods and services excluding energy by the euro area, calculated by adjusting Eurostat national accounts data for their intra-euro area component

(b) The competitors' price is an indicator of foreign prices on extra-euro area imports of goods and services which is equal to the average price in euro of exports of goods and services by suppliers to the euro area (Denmark, the United States, Japan, Norway, the United Kingdom, Sweden and Switzerland), first of all converted into euro. The weighting applied reflects the structure of extra-euro area imports of goods by the euro area (Banque de France calculations).

## 5. Conclusion

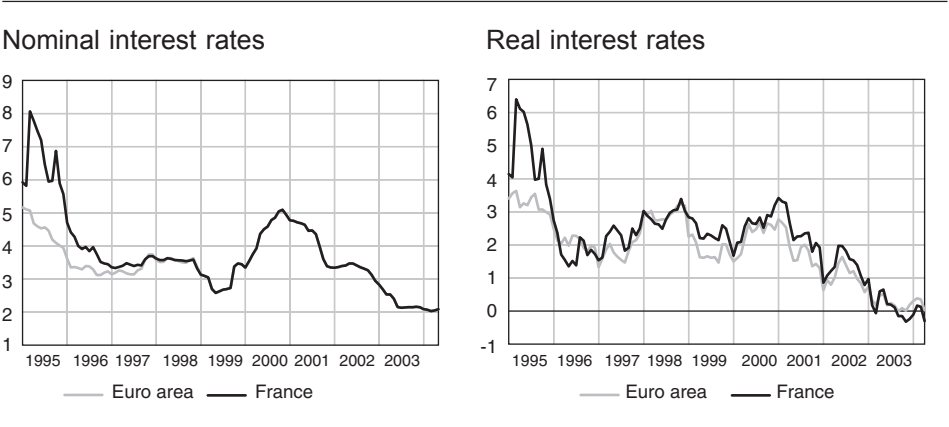
The persisting high levels of inflation appear therefore to be due to a conjunction of unfavourable shocks – not only external shocks, but also and above all domestic ones: weak productivity gains and increases in indirect taxes, the latter being particularly large in the case of France. This article provides some pointers towards elucidating the current situation. The Mascotte forecasting model for France highlights that, on account of the lags in the formation of producers and importers prices, the current level of inflation bears strong traces of the past shocks on unit costs. The same upsurge in importers' margins is found with respect to the euro area as a whole.

The existence of long transmission lags constitutes a challenge for monetary policy, which – judging from the low level of real interest rates – has been relatively accommodating over the recent period. The impact of taxes on the current level of inflation should, however, not be a lasting one provided that there is no second round effect on the formation of prices and margins.

There is, furthermore, great uncertainty regarding future developments on account of the recent hike in oil prices. If the price of Brent remained at USD 40 a barrel, the year-on-year increase in the total HICP for France would again reach almost 2 percentage points in June 2005.

The additional shock represented by the rise in oil prices could also call for a restrictive intervention in terms of monetary policy if it were confirmed that the current upward pressure on commodities prices were linked not to insufficient supply, but rather to the strength of the international economic recovery.

*Chart 12*  
**Real and nominal (3 month) interest rates in France and the euro area**



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