

## ARTICLES

# INFLATION DIFFERENTIALS IN THE EURO AREA DURING THE LAST DECADE



*This article reviews the developments of inflation differentials within the euro area over the past decade. It shows that, until 2008, a number of cyclical and structural factors worked together in the emergence and persistence of inflation differentials. In particular, mispricing of risk, overly optimistic expectations concerning future income prospects and inappropriate national policies played a role. By contrast, since 2008, developments in inflation differentials appear to be mostly related to changes in national policies aimed at reducing imbalances.*

*Understanding the sources of inflation differentials is a key input for designing the appropriate monetary policy response to preserve price stability in the euro area as a whole. Preserving price stability requires safeguarding the monetary policy transmission mechanism in all euro area countries. In this respect, the ECB non-standard measures have ensured and continue to ensure the transmission of the ECB policy stance to the real economy throughout the euro area and have prevented disorderly adjustments. These measures have been designed to preserve strong incentives for carrying out national adjustment. In the long term, persistent inflation differentials can be addressed only by national policies.*

### I INTRODUCTION

Inflation differentials in monetary unions are a common phenomenon. Countries and regions can be exposed to specific shocks, affecting one country or region but not another. However, even common shocks can cause divergences in inflation rates, given that countries and regions tend to be characterised by different economic structures, often find themselves in different stages of the business cycle, or follow different national policies (e.g. fiscal and wage policies) – both over a longer-term perspective and in response to economic shocks.

Standard statistical measures, such as standard deviations, suggest that inflation dispersion across euro area countries has, on balance, been comparable to that observed across different regions of the United States. Until the outbreak of the 2008 crisis, inflation differentials in the euro area were persistent, in the sense that many countries systematically maintained either a positive or a negative inflation gap vis-à-vis the euro area average.

Chart 1 (left-hand panel) shows that during the period 2002-08 the countries with the largest absolute average inflation differential vis-à-vis the euro area were also those where these differentials remained persistently positive or negative. In many cases this persistence

reflected unsustainable developments. In the post-2008 period (see Chart 1, right-hand panel), this systematic pattern is no longer visible. The rebalancing process that has taken place over this period has implied that, for some countries, the average inflation rate has been falling below the euro area average, while for others, it has been increasing to above the euro area average. In Germany and the Netherlands, the inflation rate has been below the euro area average during both periods.

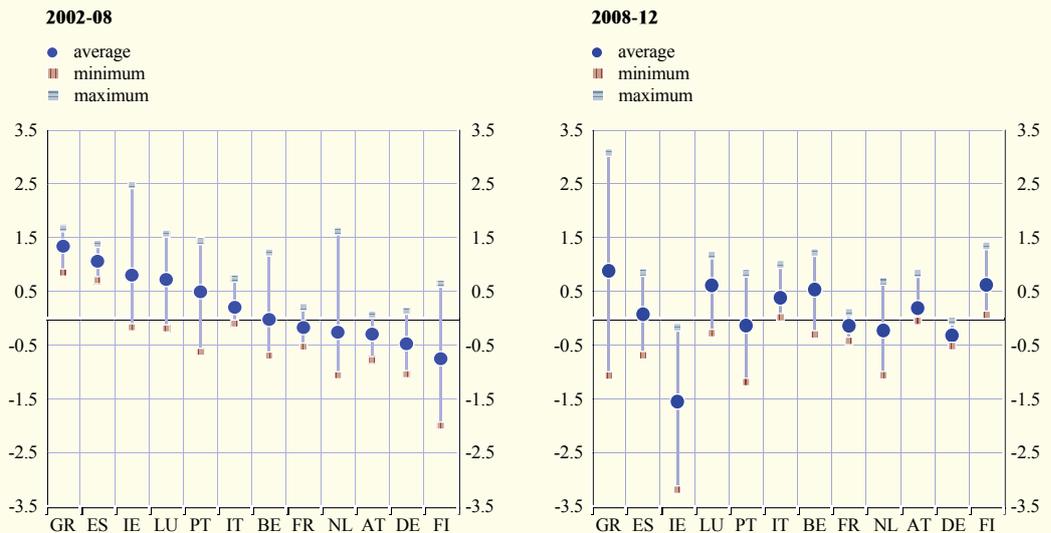
Understanding the size, persistence and determinants of inflation differentials is of critical importance in order to properly assess area-wide inflation dynamics for the design of monetary policy.<sup>1</sup> Against this background, this article reviews some key factors driving inflation differentials over the last decade, distinguishing the pre-2008 period and the rebalancing process in the post-2008 period.<sup>2</sup>

1 See Angelini, P., Del Giovane, P., Siviero, S. and Terlizzese, D., “Monetary Policy Rules for the Euro Area: What Role for National Information?”, *Working Papers*, No 457, Banca d’Italia, February 2002.

2 This article covers all countries which joined the euro area prior to 2007. For earlier discussions of this issue, see the box entitled “Inflation differentials within the euro area”, *Monthly Bulletin*, ECB, December 2000; the report entitled “Inflation differentials in the euro area: potential causes and policy implications”, ECB, September 2003; and the article entitled “Monetary policy and inflation differentials in a heterogeneous currency area”, *Monthly Bulletin*, ECB, May 2005.

Chart I HICP inflation – deviation from the euro area

(percentage points)



Sources: Eurostat, European Commission and ECB calculations.  
 Note: The countries are listed in descending order according to the differential vis-à-vis the euro area in the period 2002-08. European Commission forecasts have been used for 2012.

The article is structured as follows. Section 2 provides a general overview of the factors that can give rise to inflation differentials. Sections 3 and 4 discuss, respectively, the relevance of such factors during the “imbalances” period 2002-08 and during the “rebalancing” period 2008-12. Section 5 concludes with some policy considerations.

## 2 INFLATION DIFFERENTIALS: WHY DO THEY OCCUR AND WHY DO THEY PERSIST?

There are many factors that can give rise to inflation differentials and make them persist over time. One possible way of distinguishing different sets of factors is according to the time horizon over which their effects are likely to be felt: longer-term or structural factor, medium-term or business cycle factors and shorter-term or one-off factors.

### STRUCTURAL FACTORS

Several factors may lead to persistent inflation differentials. A prominent factor is the convergence in price levels that is to be expected,

to some degree, at least in tradable goods and services: the lower the price of a tradable good in a given euro area country, the stronger the demand for this product and the weaker the demand for more expensive substitutes produced in other euro area countries. This international competitiveness mechanism makes prices in the “cheap” countries increase faster and prices in the “expensive” countries increase slower, thus giving rise to inflation differentials.

Another convergence-related mechanism that may theoretically create long-lasting differences in inflation rates across countries is the Balassa-Samuelson effect,<sup>3</sup> which may appear in economies with uneven labour productivity growth between their tradable and non-tradable sectors: international competition among countries, especially inside a currency area, should in theory ensure that no substantial divergent price pressures emerge in the tradable sector as a result of the law of one price.

3 For evidence of the Balassa-Samuelson effect in the early years of EMU, see Wagner, M., “The Balassa-Samuelson Effect in ‘East & West’. Differences and Similarities”, *Economics Series*, No 180, Institute for Advanced Studies, December 2005.

Therefore, according to this approach, the typically higher labour productivity in the tradable sector translates into higher equilibrium real wages through rising nominal wages. Assuming perfect labour mobility within a country, higher nominal wages in the tradable sector should then contribute to pushing up nominal wages in the non-tradable sector. As a result, if labour productivity growth were lower in the non-tradable sector, prices in that sector would increase faster to prevent real wage growth from outpacing labour productivity growth, putting upward pressure on inflation.

Changes in the structure of the economy and regulations in labour and product markets can also give rise to protracted inflation differentials in a currency union. For instance, a reduction in employment protection or unemployment benefits can put downward pressure on wages and thereby lead to a negative inflation differential relative to other countries, which may last for a relatively long period of time. Similarly, deregulation that increases the degree of competition in the goods and services markets can lower firms' mark-up of prices over costs and therefore open a negative inflation differential relative to other countries. The emergence of inflation differentials can thus reflect not only adverse developments in higher inflation countries, but also favourable developments in lower inflation countries.

Inflation differentials can also arise as a result of the fact that economic structures are different: if wages and/or prices adjust with different degrees of flexibility in the aftermath of a shock (e.g. higher oil prices), inflation differentials can persist across countries.<sup>4</sup>

#### BUSINESS CYCLE FACTORS

Inflation differentials in a monetary union may also arise if countries' business cycles are not synchronised or have very different scales: countries whose economies are booming owing, for instance, to bubbles in asset prices or to

unsustainable expansionary fiscal policies are normally expected to experience higher inflation than countries whose economies are growing below potential.

The degree of persistence of these "cyclical" inflation differentials clearly depends, inter alia, on the speed at which the competitiveness channel fulfils its equilibrating role. If the competitiveness channel works very quickly, cyclical conditions would move back into line with the euro area average relatively rapidly.

By contrast, a potential source of persistence of inflation differentials could stem from the pro-cyclical working of the "real interest rate" channel. As long as national inflation expectations are affected by national cyclical conditions and hence respond strongly to the past country-specific inflation record, the ex ante real interest rate will be subdued in a country which is going through a protracted boom. As a result, domestic demand will be boosted even further and inflation differentials may last longer than they would otherwise.

#### ONE-OFF FACTORS

There are also sources of inflation differentials which tend to be short-lived. One such source, for instance, is the different impact that one-off commodity price shocks can have on price levels in individual countries. These impacts disappear from annual inflation rates after one year. Short-term effects can also be related to uneven changes in administered prices and indirect taxes (e.g. rates of value added tax) across countries. Whether inflation differentials that are due to such factors also persist for medium-term horizons depends on the prevalence of so-called second-round effects, i.e. the degree to which one-off shocks to inflation have knock-on effects for wages and prices at later stages and lead to changes in inflation expectations.

<sup>4</sup> See, for instance, Fahr, S.A. and Smets, F., "Downward Wage Rigidities and Optimal Monetary Policy in a Monetary Union", *Scandinavian Journal of Economics*, No 112, 2010, pp. 812-40.

### 3 FACTORS BEHIND INFLATION DIFFERENTIALS IN THE PERIOD 2002-08

This section discusses some of the main factors which contributed to the appearance and persistence of inflation differentials in the

euro area in the period 2002-08. In view of the multitude of factors that can be at work at any point in time, the discussion is necessarily selective. Box 1 discusses how the relevance of factors can be determined with the help of an econometric model.

#### Box 1

#### IDENTIFYING THE KEY FACTORS DRIVING INFLATION DIFFERENTIALS IN THE EURO AREA OVER THE PERIOD 2002-08

Inflation differentials between an individual Member State and the euro area as a whole can be due to many factors, and the specific set of factors is likely to differ from Member State to Member State. At the same time, it is important to know which of these factors are of a more common nature and are thus more immediately accessible for policy consideration at an area-wide level. This box describes some empirical results regarding the identification of key common factors that have been driving inflation differentials in the euro area in the period prior to the 2008 crisis.

The empirical approach is based on a dynamic panel data model estimated with annual data for 11 euro area countries (Belgium, Germany, Ireland, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal and Finland) over the period 2002-08. The estimated specification is:<sup>1</sup>

$$\pi_{it} = -0.05 \times price_{it-1} + 0.71 \times E\pi_{it+1} + 0.21 \times outputgap_{it} + 0.18 \times riskpremium_{it} + 0.18 \times adminprice_{it} + \alpha_i + \varepsilon_{it}$$

where  $\pi_{it}$  denotes the inflation rate in country  $i$  in year  $t$ ,  $price_{it-1}$  is the lagged price level in country  $i$ ,  $E\pi_{it+1}$  is the Consensus Economics forecast for inflation for the next calendar year from its December survey,  $outputgap_{it}$  denotes the cyclical component of GDP (extracted using the Hodrick-Prescott filter with data since the start of Eurostat's annual GDP time series),  $riskpremium_{it}$  denotes the distance between the country risk premium (the difference between ten-year government bond rates and German ten-year Bund rates) and its long-term trend (extracted using the Hodrick-Prescott filter with data since 1993) and  $adminprice_{it}$  is the administered price inflation rate from Eurostat. All variables are included in deviations from euro area averages.  $\alpha_i$  captures fixed country effects and  $\varepsilon_{it}$  is an error term.

The model is able to broadly fit the pattern of inflation differentials in the euro area at the country level (see the chart). A significant negative impact is found for differences in price levels (i.e. countries with lower relative price levels experienced positive inflation differentials), although the size of this negative impact is relatively small, suggesting a rather slow pace of convergence of national prices to euro area levels. Regarding the business cycle variables, the results point to a positive impact of short-term inflation expectations and the output gap (although the latter is not statistically significant), suggesting that the business cycle has had significant effects on inflation differentials over the 2002-08 period. The coefficient on the risk premium variable is not statistically significant, suggesting that most of the effect of this variable on inflation differentials may work through business cycle variables and the fixed country effect.

<sup>1</sup> The estimation method is the two-step Generalised Method of Moments (see Blundell, R. and Bond, S.R., "Initial Conditions and Moments Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, No 87, 1998, pp. 115-143).

Finally, a significantly positive coefficient is found for administered prices, and its size is consistent with the relative importance of the set of goods and services with administered prices in the HICP basket.

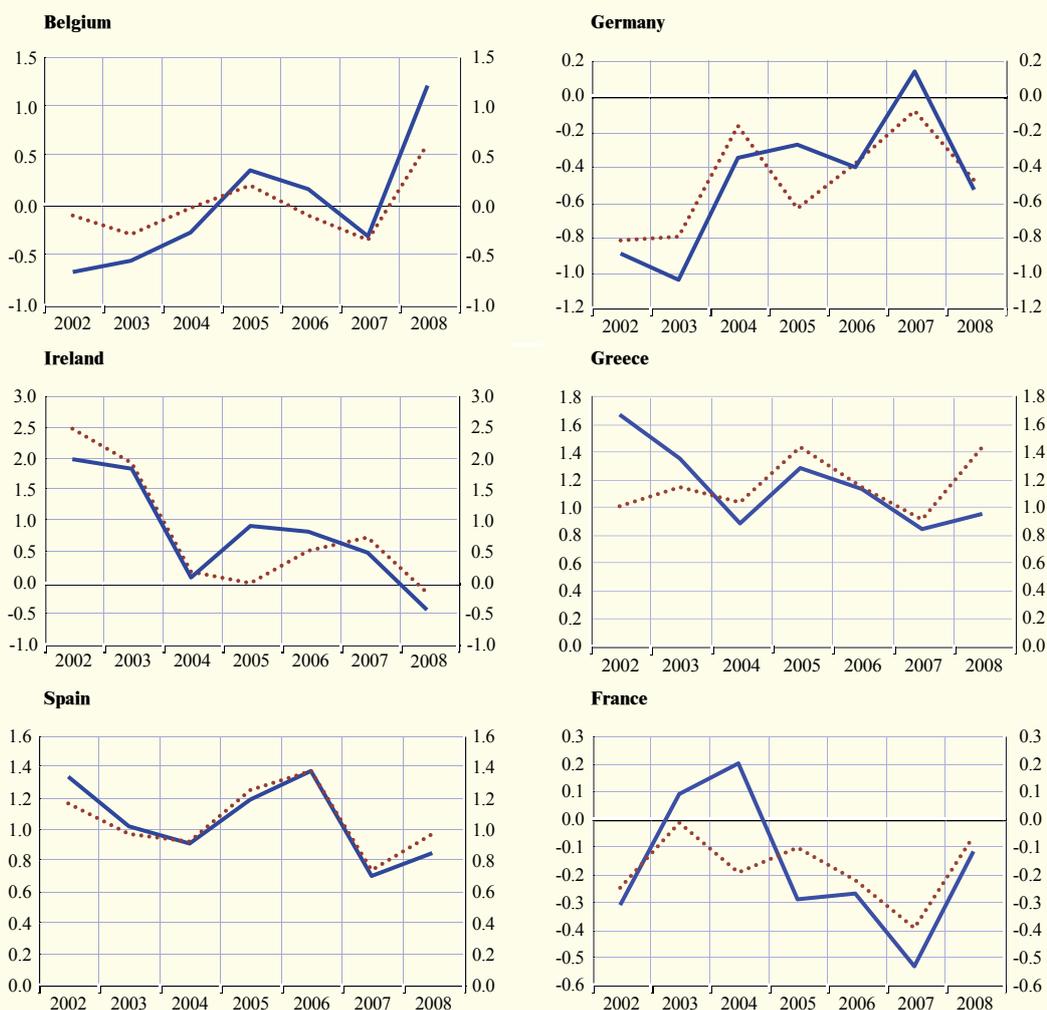
The empirical model tested the significance of many other potential determinants of inflation differentials, but found their contribution to be statistically insignificant at the euro area level.<sup>2</sup> This finding suggests that, while some of these variables may be important at the country level,

<sup>2</sup> The list of additional variables includes changes in the OECD employment protection regulation index, changes in unemployment benefits, changes in the OECD product market regulation index, changes in the OECD index of barriers to competition in the services market, the cyclical component of the labour income share, cyclically-adjusted public deficits (as a proportion of GDP) and changes in value added tax rates (reduced and standard). All variables are constructed as deviations from their euro area averages.

### Actual inflation differentials in the euro area and those implied by an econometric model

(percentage points)

— actual  
..... implied by econometric model

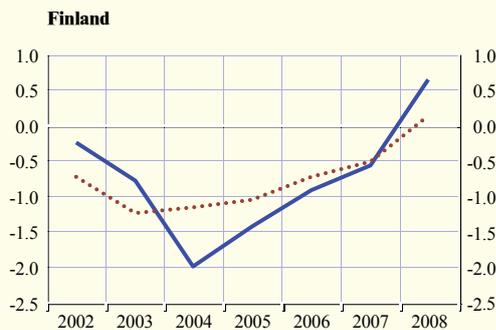
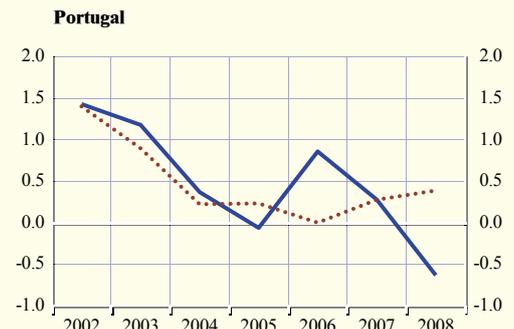
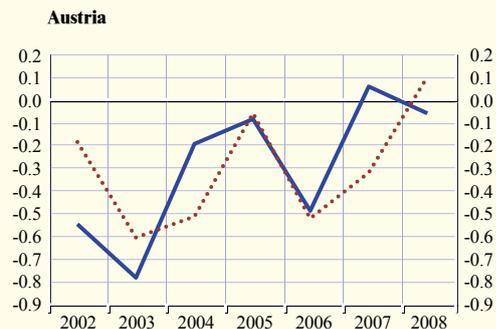
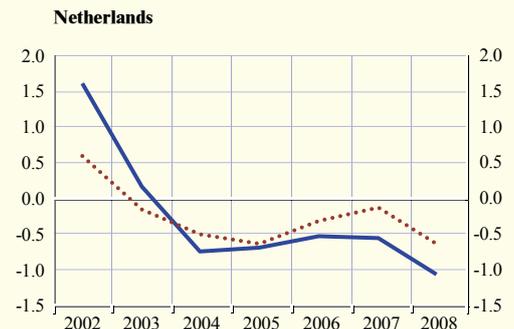
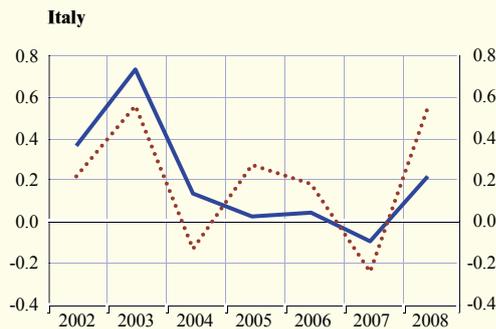


Sources: Eurostat and ECB estimations.

## Actual inflation differentials in the euro area and those implied by an econometric model (cont'd)

(percentage points)

— actual  
 ..... implied by econometric model



Sources: Eurostat and ECB estimations.

their significance disappears at the euro area level. However, this may be the result of more complex relationships between these variables and inflation differentials (e.g. non-linear or non-contemporaneous effects), or of the fact that their effects are mainly transmitted through another correlated variable. Therefore, caution is needed when interpreting these results, given that it is difficult to model all possible interactions among those variables and find all theoretical casual relationships confirmed by the data. Consequently, an analysis of inflation differentials in the euro area should also discuss a broader set of factors and not just the significant variables found in the empirical analysis.

## CONVERGENCE OF PRICE LEVELS

In the initial years of EMU, inflation differentials were largely associated with the process of the nominal convergence of catching-up countries. Such catching-up effects, operating via the convergence of prices, became less prominent after the initial years, but are still visible.

Chart 2 shows country-specific pairs of average annual inflation differentials from 2002 to 2008 and the price-level gap between the respective country and the euro area in 2002. The negatively-sloped relationship is consistent with some degree of price-level convergence in the euro area: countries whose price level was relatively low have experienced relatively higher inflation rates. This was the case, for instance, for Greece, Spain and Portugal. Luxembourg and Ireland are the only two countries which experienced a positive average inflation differential starting from a price level above the euro area average in 2002.<sup>5</sup>

## BUSINESS CYCLE AND CYCLICAL FACTORS

The business cycles across euro area countries before the 2008 crisis included some countries experiencing an unsustainable boom (e.g. Ireland,

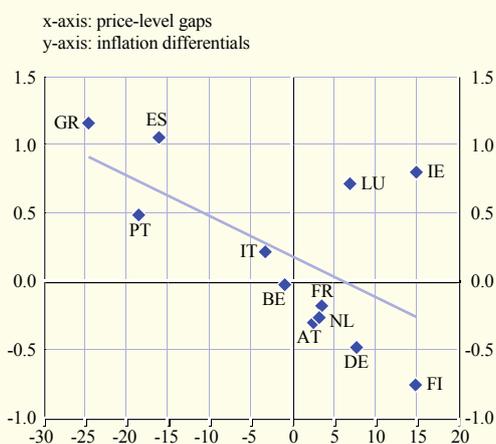
Greece and Spain), while other countries experienced relatively muted and slower economic growth. Such differences in business cycles may partially reflect the sizeable changes in real interest rates witnessed in some countries at the end of the 1990s, with peripheral countries experiencing more significant declines than others.

Commonly used indicators of a country's position in the business cycle are the output gap (an economic boom is frequently associated with output rising above potential), labour costs (wages tend to grow more when unemployment is low) and inflation expectations (the inflation rate tends to be higher when demand is strong). The output gap is often used as an encompassing proxy for cost pressures over the business cycle. Countries where real GDP is above potential GDP would experience, all other things being equal, faster increases in costs and prices than countries where output is below potential.<sup>6</sup> However, estimates of the output gap are typically surrounded by a significant degree of uncertainty and should therefore be treated with caution.

Chart 3 shows country-specific pairs of average annual inflation differentials and the differentials in average output gaps relative to the euro area average over the period 2002-08. The data suggest that different business cycle positions have probably supported inflation differentials throughout the euro area. Economic booms in many countries (e.g. Ireland, Greece, Spain and Luxembourg) were paired with positive inflation differentials, while negative output gaps in other

**Chart 2 Average annual inflation differentials from 2002 to 2008 and price level gaps in 2002**

(percentage points)



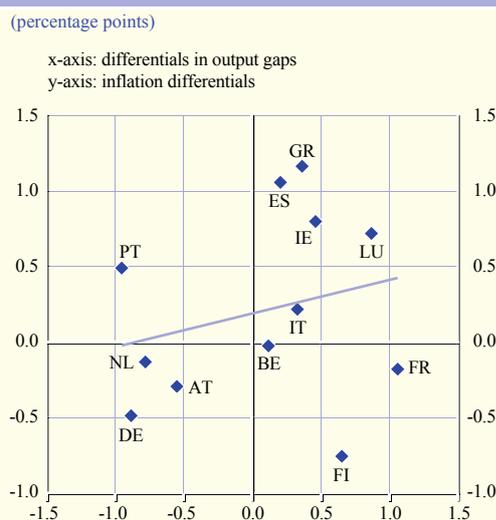
Sources: Eurostat and ECB calculations.

Note: The pale blue line denotes the fitted linear relationship between the two variables.

5 However, full price-level convergence in the euro area should not be expected since many goods and services are not perfectly tradable. For instance, the market for services is still characterised by significant barriers to competition, in which case their price would not equalise across borders but would remain linked in the long run to the real income levels of the population in each country (see Andersson, M., Masuch, K. and Schiffbauer, M., "Determinants of inflation and price level differentials across the euro area countries", *Working Paper Series*, No 1129, ECB, December 2009).

6 The standard framework for the determination of inflation at the business cycle frequency is the New Keynesian Phillips curve. In this framework, inflation is mainly affected by two determinants: firms' costs and inflation expectations. See, for instance, Gali, J. and Gertler, M., "Inflation Dynamics: A Structural Econometric Analysis", *Journal of Monetary Economics*, No 44, 1999, pp. 195-222.

**Chart 3 Average annual inflation differentials and differentials in the average output gap from 2002 to 2008**



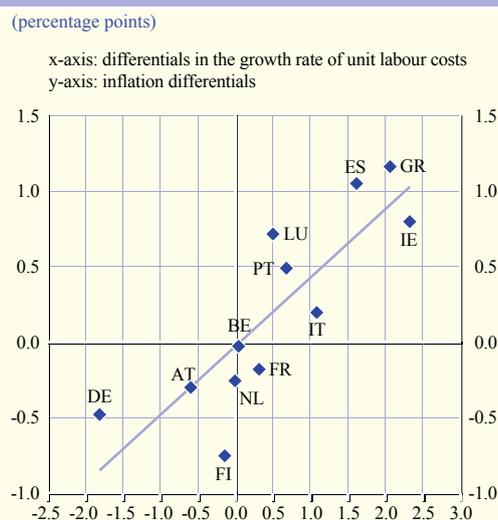
Sources: Eurostat, European Commission and ECB calculations.  
Note: The pale blue line denotes the fitted linear relationship between the two variables.

Member States (e.g. Germany, the Netherlands and Austria) were accompanied by lower and even negative inflation differentials.

A second useful indicator of a country's position in the business cycle is the growth rate of unit labour costs (ULC). As shown in Chart 4, differences in ULC developments across individual euro area countries have clearly been positively associated with differences in the HICP inflation rates over the same period. This suggests that countries that went through an economic boom experienced more significant increases in both costs and prices than in the rest of the euro area (see Box 2 for a decomposition of domestic cost pressures in euro area countries).

Inflation differentials may also be correlated to a third business cycle indicator, inflation expectations, owing to real interest rate channel effects (see Section 2). If, all other things being equal, relatively high inflation expectations reduce the real cost of borrowing for households and firms, higher consumption and investment could lead to a temporary boom in economic activity and upward inflationary pressures.

**Chart 4 Average annual HICP inflation differentials and differentials in the average growth rate of nominal unit labour costs from 2002 to 2008**



Sources: Eurostat and ECB calculations.  
Note: The pale blue line denotes the fitted linear relationship between the two variables.

Chart 5 shows inflation differentials and differentials in inflation expectations for the year ahead, and indicates that differentials in inflation expectations seem to be highly correlated with inflation differentials.

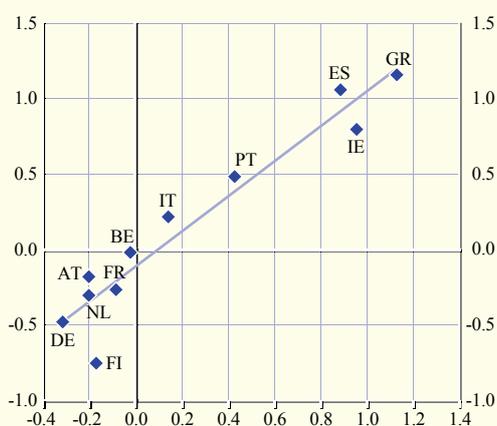
The main underlying driver of the differences in business cycle positions could be related to excessively low risk premia – defined here as the spread between ten-year government bond yields and the German ten-year Bund. The move to Stage Three of EMU led to very low interest rates in a number of countries where inflation and nominal interest rates had been systematically above the euro area average prior to 1999. The reduction of financial costs and a higher degree of integration with capital markets in the rest of the euro area may have contributed to this outcome, but most of the effect came from the market's belief that country risks were almost equal for all sovereigns that had gone through a convergence process and were participating in Stage Three of EMU.<sup>7</sup>

<sup>7</sup> See Fagan, G. and Gaspar V., "Adjusting to the euro", *Working Paper Series*, No 716, ECB, January 2007.

**Chart 5 Average annual inflation differentials and average differentials in short-term inflation expectations from 2002 to 2008**

(percentage points)

x-axis: differentials in inflation expectations  
y-axis: inflation differentials



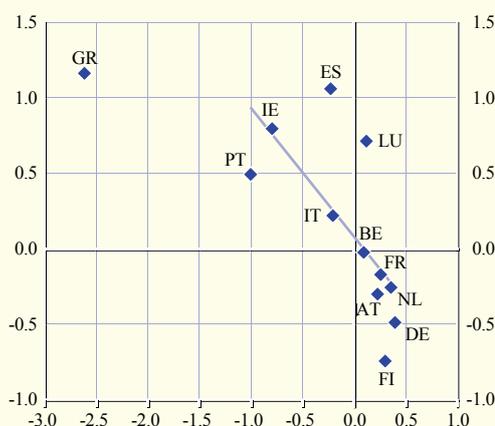
Sources: Consensus Economics and ECB calculations.

Notes: Inflation expectations refer to the next calendar year and are obtained from the January issues of Consensus Economics. Consensus Economics does not provide inflation expectations for Luxembourg. The pale blue line denotes the fitted linear relationship between the two variables.

**Chart 6 Average annual inflation differentials and differentials in the average distance between the country risk premium and its long-term trend from 2002 to 2008**

(percentage points)

x-axis: differentials in the distance between risk premia and trend  
y-axis: inflation differentials



Sources: Eurostat, ECB and ECB calculations.

Notes: The risk premium is defined as the spread between ten-year government bond yields and the German ten-year Bund. The Hodrick-Prescott filter is used to extract the long-term trend from each country's risk-premium time series over the period 1993-2011. The pale blue line denotes the fitted linear relationship between the two variables.

Households and firms in a number of countries took the opportunity of low interest rates to borrow at favourable costs. Consumption and investment then increased in those countries, supporting growth in aggregate demand and output, and fuelling consumer price and asset price inflation. In some countries, the sharp housing price increases, in turn, fuelled domestic demand further and thereby put additional upward pressure on consumer price inflation.<sup>8</sup>

Each diamond on Chart 6 shows a Member State's average inflation differential for the period 2002-08 on the vertical axis. On the horizontal axis, each diamond represents the average distance between the country risk premium and its long-term trend minus the average distance between the euro area risk premium and its long-term trend.<sup>9</sup> Therefore, negative values on the horizontal axis imply that the country risk premium was further below its

long-term trend relative to the euro area as a whole. The chart shows a negative relationship between these two variables: those countries whose risk premia were further below their long-term trend experienced a more pronounced domestic demand boom, which led to positive inflation differentials. This seems to hold true especially of Greece, but also of Ireland and Portugal and, to a lesser extent, of Spain.

<sup>8</sup> This cyclical effect may have reinforced convergence in price levels in those countries whose price level was lower than the euro area average in 2002 and then experienced a pronounced economic boom during the period 2002-08. It may also help to explain why prices in Ireland kept rising further from the euro area average.

<sup>9</sup> The euro area risk premium is calculated as a weighted average of country-specific risk premia, with weights equal to time-varying HICP weights. The Hodrick Prescott filter is used to obtain the long-term trend of each risk premium time series over the period 1993-2011 ( $\lambda=1400$ ). These estimates of the long-term trend in risk premia are surrounded by a significant degree of uncertainty and should therefore be treated with caution.

## THE INFLUENCE OF OTHER FACTORS

The evidence presented in this section suggests that different positions in the business cycle have probably had an effect in the euro area in terms of explaining inflation differentials in the 2002-08 period. Longer-term influences, such as convergence in price levels, have also played a role. However, this does not imply that other factors are not relevant during this period, especially for individual countries. Structural reforms in labour or product markets could have supported negative inflation differentials in Germany, the Netherlands and Austria, while relatively more timid reform efforts may help to explain higher inflation in countries such as Greece, Spain and Portugal. Real wage rigidities may have contributed to the persistence of inflation differentials in Belgium, Spain and Luxembourg through wage indexation clauses.

Higher cyclically-adjusted fiscal positions relative to the euro area have been accompanied by negative inflation differentials in Belgium, Germany (after 2004), the Netherlands, Austria and Finland, while larger than average cyclically-adjusted fiscal deficits may have contributed to positive inflation differentials especially in Greece and, to a lesser extent, in Portugal.

For the period 2002-08, the impact of uneven changes in administered prices across euro area countries on short-term inflation differentials was also visible. Those countries that raised administered prices significantly faster than others (e.g. Ireland, Luxembourg and Portugal) experienced positive inflation differentials with respect to the euro area.

Finally, changes in indirect taxes could also help to explain some temporary inflation differentials. In Germany, for instance, the government significantly increased indirect taxes in 2007, and the country's traditionally negative inflation differential became slightly positive that year. In 2008 its inflation differential turned back to negative territory as a result of the influence of the more persistent factors described above.

## 4 INFLATION DIFFERENTIALS AFTER 2008: THE ROLE OF REBALANCING

Since 2008 an adjustment process, which has triggered the implementation of important reforms in fiscal, financial and structural areas, has been under way in those countries which had previously accumulated significant macroeconomic imbalances and positive inflation differentials vis-à-vis the euro area. This rebalancing process has not yet led to inflation being lower than the euro area average in all countries with previously high inflation (see Chart 2). In fact, the expected downward pressures on inflation resulting from the sharp downward adjustment of domestic demand and an increase in the unemployment rate have, in some cases, been offset by fiscal consolidation measures via indirect tax and administrative price increases. In other cases, downward nominal wage rigidities have limited the adjustment of competitiveness, thereby preventing a significant reduction of domestic inflationary pressures. At the same time, in countries not affected by the adjustment process, upward inflationary pressures have prevailed in view of relatively more favourable cyclical conditions, which were possibly supported by the working of the real interest rate channel as nominal interest rates fell to historical lows and inflation expectations remained anchored.

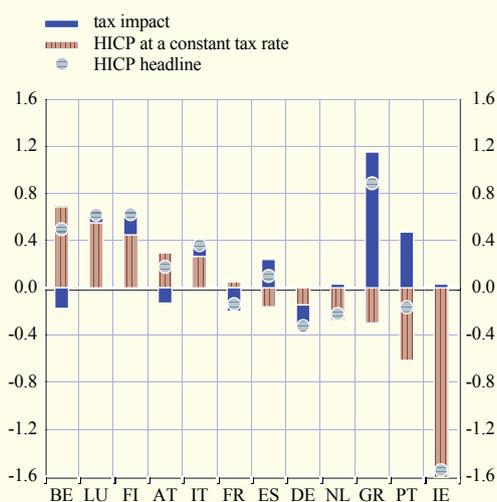
This section discusses the different macroeconomic and structural factors which have contributed to, or worked against, the reduction in inflation differentials across euro area countries from 2008 onwards.

### THE ROLE OF FISCAL CONSOLIDATION MEASURES

In contrast to the period 2002-08, indirect tax impacts played a key role in explaining inflation differentials across euro area countries between 2008 and 2012. Chart 7 shows the average tax impact on HICP inflation in the period 2008-12 across countries in deviation from the euro area. This impact considerably affected the inflation differential in Greece, Spain and Portugal and, to a lesser extent, in

**Chart 7 HICP inflation broken down by constant tax rate and tax impact (average between 2008 and 2012) – deviation from the euro area**

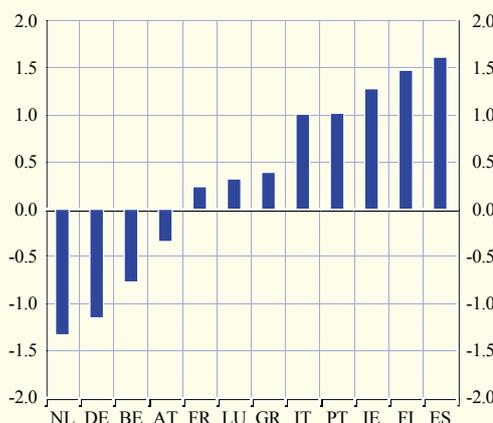
(percentage points)



Sources: Eurostat, European Commission and ECB calculations.  
Notes: The HICP at a constant tax rate excludes the potential impact of changes in indirect taxes on overall inflation. It is constructed under the assumption of an instantaneous pass-through of tax rate changes on the price paid by the consumer. The countries are listed in descending order according to the HICP at a constant tax rate. The latest observations are for August 2012.

**Chart 8 Average changes in administered prices between 2008 and 2012 – deviation from the euro area**

(percentage points)



Sources: Eurostat and ECB calculations.  
Notes: The countries are listed in ascending order according to the changes in administered prices. The latest observations are for August 2012.

Italy and Finland in recent years.<sup>10</sup> Indirect taxes are likely to continue to be a major element in governments' budget policies, with regard to both the fiscal consolidation necessary in many countries and a general tendency to rebalance the fiscal burden from direct to indirect taxes in order to reduce labour costs and the tax bias against saving.<sup>11</sup>

Government policies have also been affecting relative prices via increases in administered prices. In view of the evidence presented in Section 3, this is a factor that has been relevant in both the pre-2008 and the post-2008 period. Chart 8 shows that the increase in administered prices in Ireland, Spain, Italy, Portugal and Finland has exceeded the euro area average by a large margin between 2008 and 2012. By contrast it has been significantly below the euro area average in Belgium, Germany and the Netherlands.

## THE ROLE OF COMPETITIVENESS ADJUSTMENT

By contrast with the above government measures, relative developments in nominal ULC have been a key factor in the rebalancing of inflation differentials as countries aimed to improve competitiveness.<sup>12</sup>

<sup>10</sup> In the case of Ireland, the HICP at a constant tax rate is not available. The tax impact has been proxied by taking the difference between the GDP deflator at market prices and at factor costs.

<sup>11</sup> See the box entitled "Fiscal devaluation – a tool for economic adjustment", *Monthly Bulletin*, ECB, December 2011. See also Johansson, Å. et al., "Taxation and Economic Growth", *OECD Economic Department Working Papers*, No 620, OECD, 2008, who find that VAT and property taxes are the least harmful taxes for growth, while labour and corporate income taxes are the most damaging.

<sup>12</sup> See the article entitled "Monitoring labour cost developments across euro area countries", *Monthly Bulletin*, ECB, November 2008.

**Chart 9 HICP inflation at constant tax rates and unit labour cost growth (average for the period 2008-12)**

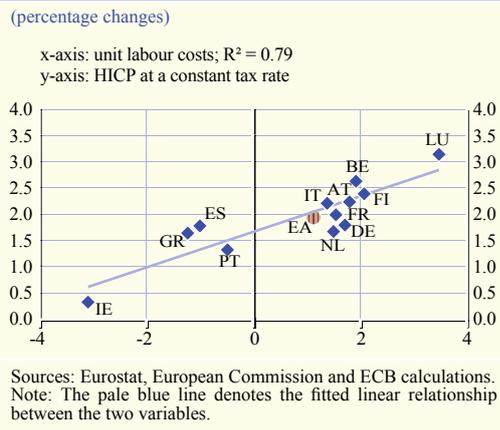


Chart 9 shows that the correlation between inflation at constant tax rates and ULC growth has also been relatively strong since 2008. Thus, countries which began to correct the previously high growth of ULC had, at the same time, experienced lower inflation rates (compared with the euro area average). By contrast, countries with only limited or no adjustment needs in most cases experienced both higher ULC growth than in the euro area as a whole and above-average inflation rates. However, the significant ULC correction in the adjusting countries has not translated fully into lower domestic inflation, partly owing to the resilience of profit margins (see Box 2).

## Box 2

### INFLATION ACCOUNTING FOR THE PERIODS 2002-08 AND 2008-12

This box shows the results of an inflation accounting exercise, which breaks down the euro area inflation differentials into their primary determinants. The exercise decomposes changes in the GDP deflator into contributions from wages, profits (as measured by the gross operating surplus) and indirect taxes (net of subsidies) – all measured per unit of output. The main contributions to the differential among countries come from unit labour costs (ULC) and the gross operating surplus in the periods 2002-08 and 2008-12. However, one can notice that in the second period the contribution from net indirect taxes to the inflation differential has increased significantly.

Notably, in Germany and Finland, below-average dynamics of both ULC and the gross operating surplus contributed to the negative GDP inflation differentials in relation to the euro area average between 2002 and 2008. In the second period, however, the dynamics of ULC have become stronger relative to the euro area in both countries.

Among the four countries with higher inflation differentials in the first period, the positive gap in Spain and Greece was the result of dynamic growth in both ULC and gross operating surplus, while the gap in Ireland and Portugal was due to higher ULC dynamics alone. In the second period a reversal of the dynamics of the GDP deflator can be observed in all four countries, particularly in Ireland. It is worth noting that the contribution of profits to the GDP deflator was very high relative to the euro area in the second period in Greece, Spain and Portugal – mitigating the adjustments achieved in terms of labour costs.

Looking at ULC developments, in the first period, the relatively strong ULC dynamics with respect to the euro area average, particularly in Ireland, Greece and Spain, was due to relatively high increases in compensation per employee. In the second period, a remarkable downward correction of ULC took place in the above countries and in Portugal. The correction with respect to the euro

Table A Results of the inflation accounting exercise for the period 2002-08

(percentage points, unless indicated otherwise)

	GDP deflator				Unit labour costs		
	Total percentage change	Contribution to change			Total percentage change	Contribution to change	
		Unit labour costs	Gross operating surplus	Net indirect taxes		Compensation per employee	Inverse labour productivity
	1=2+3+4	2	3	4	5=6+7	6	7
<b>Average annual growth</b>							
Euro area	2.1	0.7	1.0	0.3	1.2	2.2	-1.0
<b>Deviation from the euro area average</b>							
Belgium	0.0	-0.7	0.9	-0.2	0.5	0.4	0.1
Germany	-1.3	-1.1	-0.2	0.0	-1.8	-1.4	-0.4
Ireland	0.2	0.9	-1.2	0.1	2.2	3.1	-0.9
Greece	1.3	0.9	0.3	0.0	2.1	2.9	-1.1
Spain	1.6	0.9	0.8	0.0	1.6	1.1	0.5
France	0.0	0.2	-0.2	0.1	0.3	0.6	-0.3
Italy	0.0	-0.1	0.0	0.1	1.0	-0.1	1.1
Netherlands	0.0	0.1	-0.1	0.0	0.0	0.8	-0.8
Austria	-0.4	-0.3	0.1	-0.2	-0.5	0.0	-0.6
Portugal	0.6	0.4	-0.1	0.3	0.7	0.7	0.0
Finland	-0.8	-0.1	-0.7	-0.1	0.0	0.9	-0.9

Sources: European Commission, Eurostat and ECB calculations.

area average was achieved mainly thanks to significant wage reductions in Ireland, Greece and Portugal, while this occurred via strong “apparent” productivity gains, achieved through labour shedding, in Spain. Italy, which experienced strong ULC increases in the first period, did not see a significant ULC adjustment in the second period, owing to the fact that the fall in productivity caused by the recession was not followed by a downward adjustment of wages.

Table B Results of the inflation accounting exercise for the period 2008-12

(percentage points, unless indicated otherwise)

	GDP deflator				Unit labour costs		
	Total percentage change	Contribution to change			Total percentage change	Contribution to change	
		Unit labour costs	Gross operating surplus	Net indirect taxes		Compensation per employee	Inverse labour productivity
	1=2+3+4	2	3	4	5=6+7	6	7
<b>Average annual growth</b>							
Euro area	1.3	1.1	0.1	0.2	1.9	2.1	-0.2
<b>Deviation from the euro area average</b>							
Belgium	-0.2	0.6	-0.8	-0.1	0.9	0.4	0.4
Germany	-0.2	0.2	-0.5	0.0	0.4	-0.1	0.5
Ireland	-2.8	-1.9	-0.1	-0.7	-3.4	-2.3	-1.2
Greece	0.7	-0.9	1.6	0.0	-1.7	-3.0	1.3
Spain	-0.2	-1.1	1.2	-0.4	-1.9	0.2	-2.1
France	0.1	0.2	-0.2	0.1	0.2	0.0	0.2
Italy	-0.2	1.4	-1.7	0.2	0.2	-0.6	0.8
Netherlands	-0.2	0.1	0.0	-0.3	0.2	-0.1	0.2
Austria	0.3	0.3	-0.1	0.1	0.6	0.5	0.1
Portugal	-0.3	-0.9	0.7	-0.1	-1.7	-1.3	-0.3
Finland	0.8	0.9	-0.4	0.4	1.6	1.1	0.4

Sources: European Commission, Eurostat and ECB calculations.  
Note: Underlying data for 2012 are European Commission estimates.

Overall, the breakdown shows the prominent role played by wage growth both in the building-up of imbalances and in rebalancing the economy. But it also shows that a rebalancing of overall inflation differentials requires that advances made via wage restraint are not absorbed by increased profit margins.

### CYCLICAL CONDITIONS AND THE REAL INTEREST RATE

Different measures of cyclical conditions, such as the output gap and the current level of ex ante real interest rates, suggest a very different impact of cyclical conditions on inflation differentials across countries. Most of the countries which experienced low or even negative ex ante real interest rates in the run-up to the crisis saw significantly rising real ex ante lending rates with the start of the adjustment in 2008, inter alia, on the back of adjusting risk premia (see the example of bank lending rates for non-financial corporations in Chart 10). This, in turn, curbed credit growth and domestic demand. The size of the negative output gap has also contributed to subdued inflation rates in these countries relative to the euro area (see Chart 11). However, not all countries with substantially negative output gaps saw commensurate reductions in inflation

rates as the historically positive correlation between the two variables would have suggested (Chart 3 in Section 3). This indicates, inter alia, existing structural rigidities, which prevent the necessary adjustment in prices (see the role of profit margins in Box 2).

### THE ROLE OF STRUCTURAL POLICIES

The removal of existing rigidities in product and labour markets will allow the gains from the ongoing cyclical competitiveness adjustment to be preserved and the persistence of inflation differentials to be reduced.<sup>13</sup> Many of the

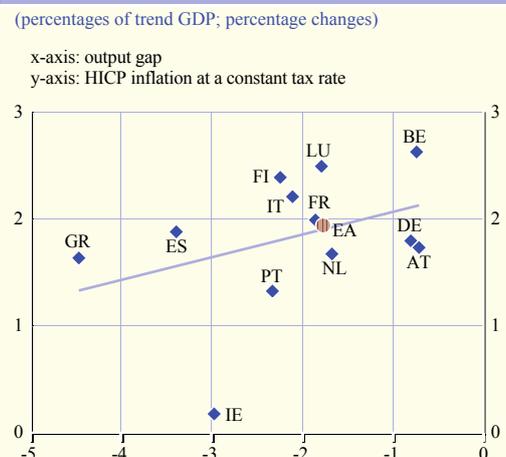
<sup>13</sup> Empirical evidence confirms that reforms targeting these rigidities will facilitate the removal of persistent inflation differentials. See Birioli P., Mourre G. and Turrini A., "Adjustment in the euro area and regulation of product and labour markets: an empirical assessment", *European Economy*, Economic Papers, No 428, 2010, and Jaumotte, F. and Morsy, H., "Determinants of Inflation in the Euro Area: The Role of Labour and Product Market Institutions", *Working Paper Series*, No 12/37, IMF, January 2012.

**Chart 10 Real ex ante lending rates to non-financial corporations**



Sources: ECB and Consensus Economics.  
Notes: Lending (composite) rates are only available as of 2003 and are not available for Luxembourg. The countries are listed according to the real ex ante lending rate in 2012. The latest observations are for August 2012.

**Chart 11 Output gap and HICP at constant taxes (average for the period 2008-12)**



Sources: Eurostat, European Commission and ECB calculations.  
Note: The pale blue line denotes the fitted linear relationship between the two variables.

countries with substantial losses in competitiveness prior to the crisis have started to increase the flexibility of their product and labour markets. In particular, labour market reforms have helped to achieve some degree of downward flexibility of wages in several countries. Contrary to the progress made on the labour market side, the steps taken towards improving competition in the non-tradable sector have thus far been weaker in most countries, limiting price adjustment. Excessive profit margins are particularly prevalent in domestically oriented sectors (predominantly the services sectors).

A number of fiscal policies, such as cuts in public sector wages, have been helping to adjust competitiveness and have therefore exerted downward pressures on domestic inflation.

## 5 CONCLUSIONS

This article has identified factors that help to explain the build-up of inflation differentials across euro area countries during the pre-2008 period and those that were at work during the period of “rebalancing” after 2008. Some of the factors, such as output gaps, real interest rates and risk premia, are now operating in the opposite direction from that in the pre-2008 period. Overall, the ongoing rebalancing process has reduced the previous persistence of inflation differentials, although the inflationary impact of some necessary fiscal consolidation measures prevents a clearer decline of inflation in adjustment countries to levels below the euro area average. The fact that inflation dispersion in the post-2008 period remains high is thus partly the reflection of a welcome process of adjustment and rebalancing.

To make sure that the rebalancing will continue to work as an equilibrating adjustment process that ultimately leads to lower inflation dispersion, strong determination will need to be maintained on the part of national policy-makers to achieve a higher degree of flexibility in all regions of the euro area. Looking further ahead, once current

imbalances have been adjusted, a number of changes in the economic governance of the euro area should make a renewed significant build-up of macroeconomic imbalances less likely, thus limiting the risk of harmful inflation differentials in the future. In particular, in the context of the new macroeconomic imbalance procedure, it should be ensured that euro area countries put in place the right policies to prevent any future emergence of macroeconomic imbalances.

The strengthened fiscal framework also introduces key control mechanisms that should prevent the reoccurrence of the strong pro-cyclicality in fiscal policies experienced in the past in several countries. Therefore, inappropriate fiscal policies should become less of a source of domestic inflationary pressures and inflation differentials in the euro area, provided that there is a swift adoption and implementation of the stricter budgetary rules in national laws, and that the new European governance framework is implemented rapidly.

Inflation differentials that result from structural inefficiencies or systematically misaligned national policies need to be addressed by national fiscal and economic policies. They cannot be tackled by the single monetary policy.

The best contribution that monetary policy can make to support the readjustment process in the euro area is to ensure price stability in the area as a whole over the medium term. However, maintaining price stability requires safeguarding the monetary policy transmission mechanism in all euro area countries. In this respect, the ECB non-standard measures have ensured and continue to ensure the transmission of the ECB policy stance to the real economy throughout the euro area and have prevented disorderly adjustments. These measures have been designed to preserve strong incentives for carrying out national adjustment.