

STRUCTURAL FACTORS AND INFLATION DYNAMICS

Recent literature has identified a set of factors that could be pushing global inflation rates persistently downwards, particularly in advanced economies. Noteworthy among these factors are the structural consequences of population ageing, the globalisation process (with greater trade openness and exposure to international competition) and the impact of new technologies (digitalisation and new forms of trade).

In particular, the process of population ageing in advanced economies could contribute to a more reduced trend inflation through several channels, as described in Chapter 4 of this report. First, the weight in the older population’s consumption basket of the more inflationary goods and services is, overall, comparatively lower than for other age groups, leading to lower general price increases owing to a composition effect. Also, since the accumulation of net

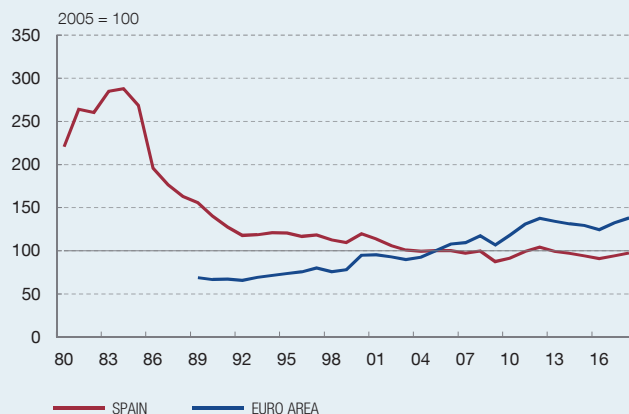
Chart 1
FACTORS CONDITIONING INFLATION IN THE LONG TERM

Demographic changes and globalisation may affect inflation dynamics. The so-called “digital revolution” is also one of the global factors that might be inducing downward pressure on prices.

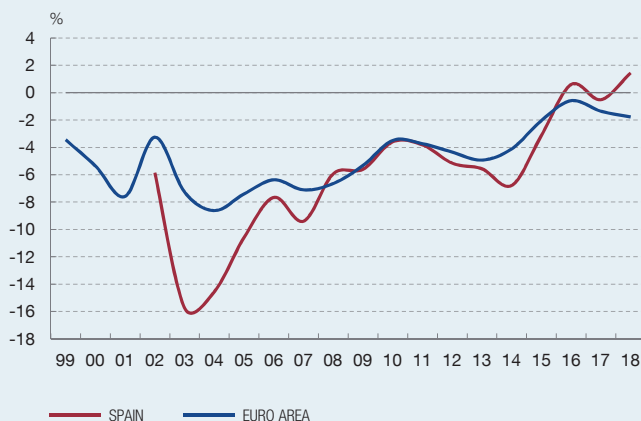
1 WORLD TRADE IN GOODS AND SERVICES (REAL)
Volume index



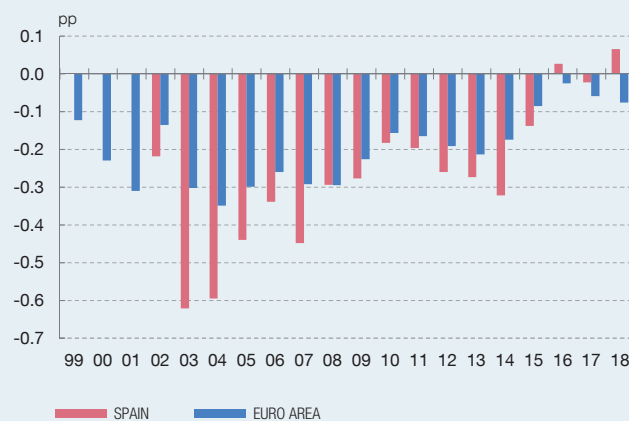
2 IMPORT PRICES IN REAL TERMS (a)



3 ANNUAL TECHNOLOGICAL PRODUCT INFLATION IN SPAIN AND IN THE EURO AREA (b)



4 CONTRIBUTION OF TECHNOLOGICAL PRODUCTS TO OVERALL INFLATION IN SPAIN AND IN THE EURO AREA



SOURCES: ECB Digitalisation Survey, Eurostat and ECB calculations.

- a Unit value indices of imported goods.
- b Technological products: telephone and fax equipment and services, and audiovisual, photographic and information processing equipment.

wealth generally increases with age, a larger proportion of elderly people could lead to a greater counter-inflationary bias in society and, therefore, to more support for counter-inflationary monetary policies. Population ageing may drive average wage growth downwards, given that wages tend to grow at the start of a person's working life and are relatively steady towards the end. Additionally, there is recent evidence that the greater labour supply for workers between 55 and 64 years old generates downward pressures on wage growth.¹

Population ageing also affects the natural rate of interest by lowering it, since it induces people to save more during their working life to be able to finance their retirement. A very low natural rate of interest conditions the effectiveness of monetary policy by making it more difficult, in a low inflation environment, for the real interest rate to stand at levels aligned with the natural rate. Chapter 3 of this report examines in detail the role played by the natural rate of interest in monetary policy strategies and the importance of demographic factors for its determination. Also, according to the estimates presented in that chapter, the natural rate of interest was negative in the euro area during the past decade, hindering the ability of conventional monetary policy to combat low inflation, since in such a situation nominal interest rates aligned with their lower bound with very limited room for further reductions would not suffice to generate the inflationary effects desired. In this situation, unconventional monetary policy was what provided expansionary stimuli to try to approximate the inflation observed to its medium-term target.

Globalisation also contributed to reducing global inflation rates, through several channels. Specifically,² both

greater trade openness (see Chart 1) and the development of global value chains – reflected in an increase in the weight of trade in intermediate goods and services in the total – contributed to reducing inflation sensitivity to internal supply and demand conditions against a background of more synchronised world economic activity. Additionally, globalisation limited price and wage increases, mainly in those sectors more exposed to international competition.

The so-called “digital revolution” is another global factor that could be giving rise to downward pressures on price changes.³ First, the development of information and communication technologies leads to direct cost savings in the production of genuinely digital consumer goods and services (such as software or communication services), and to indirect cost savings through the use of the latter as intermediate consumption in the production of other consumer goods and services. Second, aside from the cost channels, increasingly widespread electronic trading may affect consumer prices through both direct channels (owing to lower operating costs for internet-based firms) and indirect channels (owing to greater price transparency and a higher degree of competition in goods and services purchased online). A recent ECB survey of non-financial corporations in the euro area confirms that the new technologies provide firms with more flexibility for reducing costs.⁴

The decrease in the level of inflation in recent decades was accompanied by a significant fall in uncertainty over price changes. Chart 2 shows that it is estimated that inflation volatility in the euro area has declined since the 1980s.⁵ This lower uncertainty can be largely associated

1 See B. Mojon and X. Ragot (2019), *Can an Ageing Workforce Explain Low Inflation?*; BIS Working Paper 776.

2 See, among others, T. Helbling, F. Jaumotte and M. Sommer (2006), “How has globalization affected inflation?”, *IMF World Economic Outlook*, Chapter 3.

3 See C. Elding and R. Morris (2018), “Digitalisation and its impact on the economy: insights from a survey of large companies”, *ECB Economic Bulletin* 7/2018.

4 See C. Elding and R. Morris (2018), “Digitalisation and its impact on the economy: Insights from a Survey of Large Companies”, *ECB Economic Bulletin* 7/2018.

5 Estimated in the context of the decomposition model presented in D. Leiva-León, J. J. Pérez, G. Pérez-Quirós and A. Urtasun (2019), *Structural Instabilities in the Euro Area*, Banco de España Working Paper (forthcoming). Similar results for the aggregate euro area can be found in G. M. Caporale, L. Onorante and P. Paesani (2010), *Inflation and Inflation Uncertainty in the Euro Area*, ECB Working Paper 1229. The results for the euro area countries taken individually corroborate the estimation for the euro area as a whole [see, in particular, M. Correa-López, M. Pacce and K. Schlepper (2019), *Exploring Trend Inflation Dynamics in Euro Area Countries*, Banco de España Working Paper 1909]. In J. Stock and M. Watson (2007), “Why Has US Inflation Become Harder to Forecast?”, *Journal of Money, Credit and Banking*, 39, pp. 3-33, evidence is provided that a similar process took place in the United States.

STRUCTURAL FACTORS AND INFLATION DYNAMICS (cont'd)

with the preparation and launch of the monetary union, which involved a step towards a monetary policy regime more geared towards price stability than the preceding regime, especially in periphery countries.⁶ A similar phenomenon also occurred in most advanced economies.

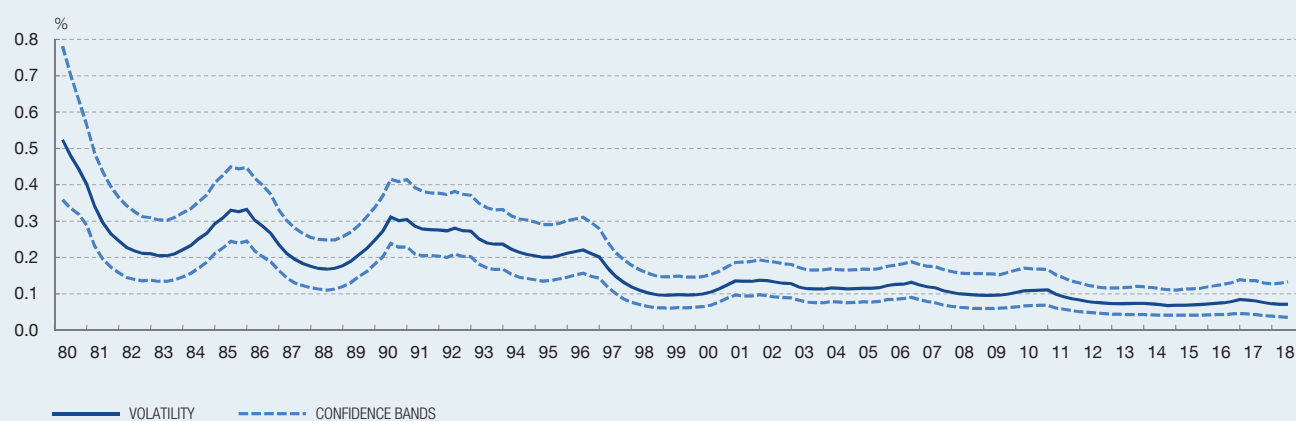
The literature suggests that there is a positive relationship between the degree of inflation uncertainty and the level of inflation.⁷ In an environment of low inflation uncertainty, a shock impacting this variable (upwards or downwards)

allows for a more precise response from the monetary authority, which therefore generates certainty about future developments in the pace of price changes. In this connection, a central bank with a commitment to price stability may also reduce this uncertainty. However, some analyses also suggest that, in this environment of lower uncertainty over inflation the effectiveness of monetary policy could be hampered because a central bank's ability to generate inflation surprises would be lower.

Chart 2
STOCHASTIC VOLATILITY IN EURO AREA INFLATION

The decline in the level of inflation has been accompanied by a significant decrease in uncertainty over price changes.

INFLATION VOLATILITY IN THE EURO AREA



SOURCES: ECB and Banco de España [Leiva-León, Pérez, Pérez-Quirós and Urtasun (2019b)].

6 See M. Evans and P. Wachtel (1993), "Inflation Regimes and the Sources of Inflation Uncertainty", *Journal of Money, Credit and Banking*, 25, pp. 475-511.

7 This relationship is called the Friedman-Ball hypothesis [see M. Friedman (1977), "Nobel Lecture: Inflation and Unemployment", *Journal of Political Economy*, 85, pp. 451-472, and L. Ball (1992), "How Does Inflation Raise Inflation Uncertainty", *Journal of Monetary Economics*, 29, pp. 371-388]. In connection with theoretical arguments and empirical evidence in favour of this hypothesis, see the revisions of economic references about these issues in Caporale, Orante and Paesani (2010) *op. cit.* and E. Rosas and T. López (2018), "Inflación e incertidumbre inflacionaria: la postura del Banco de México, 1969-2017", *Finanzas y Política Económica* no. 10, pp. 348-372. Nonetheless, the literature is inconclusive about the existence of a causal relationship between the two variables, as it depends on the institutional framework in which monetary policy is conducted.