IV. Economic benefits of the euro

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Abstract: This section analyses how euro area Member States and their citizens have benefited from the euro since its launch more than 20 years ago and to what extent the expected benefits of its introduction have materialised. The adoption of the euro has facilitated cross-border transactions, especially in product and financial markets, thereby increasing price transparency and competition. However, barriers limiting consumer choice and full price competition, such as the incomplete Single Market, remain. Medium-term price stability across the euro area has been achieved since the launch of the euro; and increasingly integrated financial markets have also provided citizens and firms with more opportunities to share risks. At the same time, however, lower transaction costs and elimination of nominal exchange rate risk had a stronger impact on cross-border financial flows than on intra-euro trade in goods and services which led to an unsustainable accumulation of debt in some Member States in the run-up to the global financial crisis. Overall, the section concludes that the euro can only reach its full beneficial potential once the economic and monetary union (EMU) architecture is completed ([254]).

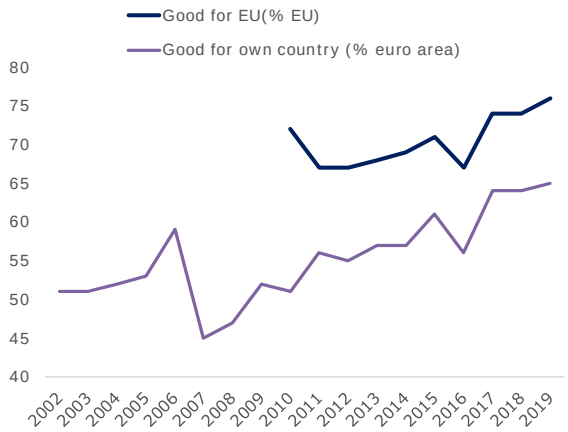
IV.1. Introduction

The introduction of the euro marks one of the most ambitious undertakings in the history of European unification. The changes it brought are in many cases beyond economic analysis only. Indeed, a common currency may present many textbook benefits, but the euro's eventful life prompts us to examine the theory more thoroughly. It may also provide a reminder in times of crisis, such as the current COVID-19 crisis, that while institutional reform is necessary to reap the full benefits of the euro, the common currency has improved the lives of European citizens regardless.

As such, this section will describe how the euro area Member States and their citizens have benefited from the adoption of the euro, based on a literature review. At the same time, it highlights those areas where the euro could not fulfil expectations, thus calling for continued reform efforts and deepening of the Single Market.

The euro was launched on 1 January 1999. By mid-2020 the euro had become a currency used daily by about 340 million citizens of the euro area. It is also the second most used currency around the world and another 60 countries and territories, representing 175 million people, have pegged their own currencies, either directly or indirectly, to the euro ([255]).

Graph IV.1: **The impact of the euro on one's own country and on the European Union (Flash Eurobarometer survey)**



(1) A positive reply to the questions 'Having the euro is a good or a bad thing for your country (% - EURO AREA)' and 'Having the euro is a good or a bad thing for the EU (%)'.
Source: Flash Eurobarometer 481.

According to a recent Flash Eurobarometer survey ([256]), 65% of respondents across the euro area stated that they thought the euro was good for their own country – the highest score since the survey was launched in 2002 – while 76% of respondents across the euro area were of the opinion that the euro was good for the EU – see Graph IV.1. In addition, beyond the freedom and democracy that the EU provides its citizens with,

([254]) The authors wish to thank an anonymous reviewer and ECB colleagues Virginia Di Nino, Ettore Dorrucci, Michael Ehrmann, Michael Fidora, Peter McQuade, Mario Porqueddu, Daniel Sousa Carvalho, Georg Strasser, Guido Wolswijk and Christoph Zwick for useful comments on earlier drafts. The views expressed are the author's alone and do not necessarily correspond to those of the European Commission.

([255]) For more details see https://europa.eu/euroat20/the-euro-in-numbers/

([256]) European Commission Flash Eurobarometer 481, November 2019.

the euro has been considered to be the most important element of a European identity ([257]).

A daunting research challenge

At its launch, the expectations of the potential economic benefits of the euro were high. It was generally expected that a single currency would bring price and exchange rate stability, foster intra-euro area trade and provide a shelter against currency crises, and that more efficient capital markets would allow capital to flow across borders to its most efficient use and promote cross-border risk sharing ([258]).

At the same time, it was also expected that the introduction of the euro would strengthen the incentives for structural reforms such as labour market reforms along 'flexicurity'-principles, while other developments such as an accelerated expansion of global value chains might not have been fully anticipated.

However, since then quantifying these benefits and costs turned out to be challenging, as the most important benefits such as those arising from increased cross-border trade and capital flows accrue only gradually, while other costs and benefits are one-off and have an immediate impact, such as transition costs to the new currency ([259]).

Moreover, when assessing empirically the euro's impact, it is not always possible to disentangle the effects of the adoption of the euro from other developments such as the deepening of the Single Market or the effects stemming from the self-reinforcing interactions between the two.

Outline of the section

Building on previous reviews of the benefits of the euro ([260]), this section is structured as follows. The second subsection examines how the adoption of the euro complements the functioning of the Single Market by lowering transaction costs and reducing nominal exchange rate uncertainty for households and firms. This benefits consumers as well as producers, as it reduces the price search cost, pushes prices closer to marginal costs and increases the efficient allocation of resources. Such benefits are not always available under a flexible nominal exchange rate regime, as flexible exchange rates often violate the purchasing power parity conditions in the wake of volatile financial market shocks ([261]).

The third subsection highlights how the adoption of the euro strengthened price stability through a credible common monetary policy that reduced upward biases in inflation expectations. It argues also that although the irreversible fixing of the nominal exchange rate has eliminated the benefits of nominal exchange rate adjustments, nominal exchange rates have become less effective and relevant in the wake of ongoing structural changes such as the expansion of global value chains and increasing foreign exchange balance sheet exposure of households and firms. The subsection furthermore discusses some areas where pre-euro expectations were not met, for example, increased wage flexibility and Member States' structural reform efforts.

The fourth subsection explores in more detail the extent to which the single monetary policy and the elimination of competitive nominal devaluations promoted intra-euro area trade and foreign direct investment (FDI). This subsection provides also a brief overview of the benefits associated with a stronger international currency status of the euro.

The fifth subsection describes some missing elements in the well-functioning of the economic and monetary union (EMU). The last subsection draws some conclusions.

All in all, the analysis suggests that while the micro-economic channels such as lower transaction costs were to a large extent in line with the findings reported in the literature prior to the launch of the euro, the macro-economic channels turn out to be less in line with what was expected. For instance, the elimination of nominal exchange rate flexibility seems to have had a stronger impact on intra-euro area financial flows than on intra-euro trade flows,

([257]) Parlemeter 2016, Special Eurobarometer of the European Parliament, November 2016.

([258]) See for instance Emerson, M., Gros, D., Italianer, A., Pisani-Ferry, J. and H. Reichenbach (1992), *One Market, One Money: An Evaluation of the Potential Benefits and Costs of Forming an Economic and Monetary Union*, Oxford: Oxford University Press

([259]) For instance the one-off costs for shops to create new price lists denominated in euro.

([260]) See, for instance, ECB (2008), '10th Anniversary of the ECB', *ECB Monthly Bulletin.*

([261]) See, for instance, Bergin, P. and L. Ching-Yi (2012), 'The Dynamic Effects of a Currency Union on Trade', *Journal of International Economics*, Vol. 87, No. 2, pp. 191–204.

Table I.1: **Potential and actual economic benefits of the euro**

Effect			Impact	Realised benefits
Direct effects	Lower transaction costs		Elimination of costs associated with currency conversion and cross-border payments· Strengthening of firms' productivity and competitiveness	significant
	Elimination of exchange rate volatility		Reduced uncertainty fosters export and investments Reduced foreign exchange balance sheet exposure helps to diversify risks and stabilise domestic consumption	significant
	Lower inflation bias		Reduced loss of purchasing power for non-indexed income and wealth Reduced "shoe-leather" costs Beneficial effect on innovation Lower inequality	significant
Intermediate effects		Price convergence on product and capital markets	Lower prices and more choice for consumers Lower resource allocation inefficiencies Increased portfolio diversification, reducing savings and income volatility More uniform costs of funding strengthen competition in the Single Market	moderate
		International trade	Increased trade volumes due to reduced exchange rate uncertainty and transaction costs	significant
		Capital flows and financial market integration	Increased financial market integration due to lower currency risk and transaction costs, e.g. increased intra-euro area FDI. Increased shock absorption capacity and higher potential growth due to increased cross-border risk-sharing opportunities.	significant limited
		Cross-border labour mobility	Reduce unemployment and support aggregate demand in countries affected by idiosyncratic shocks	limited
		Incentives to conduct national structural reforms	Reforms improve well-functioning of markets and increase countries' shock absorbtion capacity	limited

(1) The shoe-leather cost measures the opportunity costs of holding money when nominal interest rates increase in response to anticipated inflation.
Source: Author's representation.

and in the run-up to the global financial crisis financial flows acted as a source of instability rather than promoting sustainable growth.

Table IV.1 provides a brief summary of the benefits stemming from selected channels associated with the adoption of the euro, such as lower transaction costs and less exchange rate volatility.

This section complements the second issue of the special 2019 Quarterly Report on the Euro Area (QREA) edition that provided an overview of developments since the launch of the euro in 1999 in terms of economic performance, institutional developments and further efforts needed ([262]).

IV.2. Complementing the Single Market

The euro complements the well-functioning of the Single Market by reducing transaction costs through systemic innovations such as the single euro payments area and by eliminating nominal exchange rate volatility within the euro area. In

([262]) Available at https://ec.europa.eu/info/publications/quarterly-report-euro-area-volume-18-no-2-2019_en

turn, these developments increase price transparency and market integration, which have a strong potential to increase societal welfare.

IV.2.1. Lower transaction costs

Prior to the adoption of the euro, the coexistence of multiple national currencies implied substantial resource costs in the conduct of cross-border payments ([263]). A common currency naturally eases the payment process between its Member States, as it (i) eliminates the cost to convert currencies, (ii) saves on operational costs associated with handling currencies and (iii) increases the incentives and opportunities to simplify the execution of cross-border payments for firms ([264]) as well as households ([265]).

A first step towards capitalising on these inherent benefits of a single currency was the 2001 EU Regulation on cross-border payments in euro ([266]), which eventually gave rise to further harmonisation and integration of European payment systems under the Single Euro Payments Area (SEPA) initiative.

The direct benefits of SEPA for European citizens include a single system for both domestic and cross-border bank transfers, which allows charging an account directly in one country for services provided in another country. Similarly, it allows people who are working or studying in another SEPA country to use an existing account in their home country to receive their salary or pay bills in the new country. Already by 2006, SEPA had helped to reduce the cost of transferring money in euros between euro area countries on average by 90% compared to 2001 ([267]).

At the same time, SEPA also strengthens euro area firms' productivity and competitiveness. More specifically, it helps firms to create more efficient euro cash-management infrastructures, enhances cash pooling, enables more efficient clearing and adoption of e-invoicing and helps to establish an integrated market for electronic payments in euros by credit card, debit card, electronic bank transfer or direct debit. In addition, significant direct gains are made by automating and streamlining activities and by unlocking liquidity and credit lines required for clearing transactions ([268]).

Overall, a fully operational SEPA has been estimated to yield a recurring annual benefit of EUR 22 billion due to increased price convergence and process efficiency ([269]), a cost-saving example that reaffirms one of the most straightforward benefits of the euro. In turn, these gains should also directly benefit all citizens to the extent that they are passed on to consumers.

IV.2.2. Elimination of intra-euro area exchange rate volatility

Prior to the adoption of the euro, nominal exchange rates of what were to become euro area Member States showed strong volatility ([270]) with,

([263]) For instance De Grauwe (2012), *The Economics of Monetary Union*, Oxford University Press, reports that various surveys suggest that prior to the introduction of the euro, banks' commissions on exchanging currencies constituted about 5% of their revenues. The European Commission at http://europa.eu/rapid/press-release_MEMO-19-1170_en.htm?locale=en reports that by end-2019 a transaction in euro from a non-euro area Member State to a euro-area Member State was priced between EUR 15 and EUR 24 regardless of the transaction amount, while a transaction within the euro area may be free of charge or cost only a few cents.

([264]) International transactions imply a broad range of costs, see for instance Anderson, J. and E. van Wincoop (2004), 'Trade Costs', *Journal of Economic Literature*, Vol. 42, no. 3, pp. 691-751.

([265]) For instance, households that engage in intra-EA tourism or cross-border shopping do not have to convert and hold different currencies.

([266]) Regulation (EC) No 2560/2001 of the European Parliament and of the Council on cross-border payments in euro forbid payment service providers from imposing different charges for domestic and cross-border payments or ATM withdrawals in euro within the EU.

([267]) See for instance European Commission (2006), Commission staff working document on the impact of Regulation (EC) 2560/2001 on bank charges for national payments, SEC (2006) 1783.

([268]) See PricewaterhouseCoopers (PwC) (2014), 'Economic analysis of SEPA Benefits and opportunities ready to be unlocked by stakeholders'.

([269]) Of which EUR 13.2 bn to the corporate sector, EUR 2.9 bn the public sector and EUR 5.9 bn to the banks. Estimate reported by PwC (2014), *op cit.*

([270]) On the empirical relevance of volatility in the foreign exchange market before the launch of the euro, see, for instance, Goodhart, C. (1989), 'News and the foreign exchange market', *LSE Financial Markets Group Discussion Paper*, No 71, Goodhart, C. and L. Figliuoli (1991), 'Every minute counts in financial markets', *Journal on International Money and Finance*, Vol. 10, pp. 23–52, and Faust, J., J. Rogers, E. Swanson and J. Wright (2002), 'Identifying the Effects of Monetary Policy Shocks on Exchange Rates Using High Frequency Data', *Board of Governors of the Federal Reserve System, International Finance Discussion Papers* No. 739. In addition, foreign exchange traders themselves may also be a source of a rich dynamic in the foreign exchange markets if their strategies are based on trial and error in an uncertain world. See, for instance, De Grauwze, P and P. Grimaldi (2012), *The Exchange Rate in a Behavioral Finance Framework*, Princeton University Press. Moreover, nominal exchange rates may overshoot their equilibrium value when rigidities in product prices hinder full price adjustment, with exchange rate fluctuations compensating for this lack of product market flexibility. See Dornbusch (1976), 'Expectations and Exchange Rate Dynamics', *Journal of Political Economy*, Vol. 84, No. 6, pp. 1161–1176.

for instance, strong depreciations (up to 15% vis-a-vis the ECU on a yearly basis) of the Italian lira and strong appreciations (up to almost 10%) of the Deutschmark – see Graph IV.2. Such volatility may generate important feedback loops to the real economy, for instance through a lower propensity of firms to export, higher exchange rate hedging costs and lower incentives for cross-border portfolio diversification.

With the adoption of the euro, nominal exchange rate volatility between Member States was fully eliminated; this in turn also led to decreased real effective exchange rate volatility in most euro area Member States ([271]), and in particular in Finland, Portugal, Italy and Spain (see Graph IV.3), leading to increased intra-euro area trade and cross-border investment as detailed in subsection IV.4.

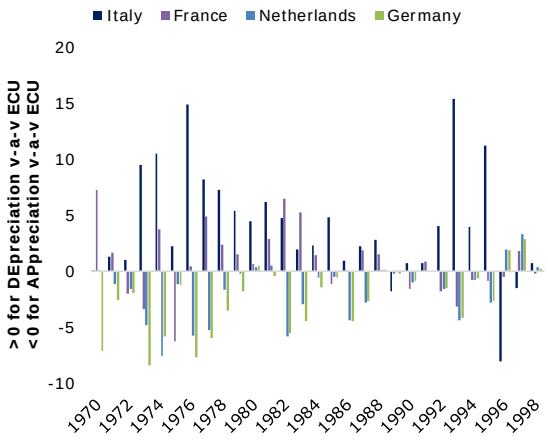
Available empirical research suggests that a one standard deviation decrease in real effective exchange rate volatility is associated with a 1.7 to 2.3% increase in real GDP growth ([272]), highlighting the beneficial effects of the common currency on Member States' economic growth.

IV.2.3. Price convergence in product markets

An important effect of the systemic innovations in cross-border payments and the elimination of nominal exchange rate uncertainty is price arbitrage and the subsequent convergence of prices across countries, which is associated with notable gains in product as well as financial markets.

In product markets, price convergence ([273]) across the Member States that joined the euro area before 2002 (i.e. EA11 ([274])) accelerated during the second half of the 1990s – see Graph IV.4. This acceleration was triggered by the further deepening of the Single Market and the Maastricht convergence criteria. However, this price convergence petered out as of 1999, reflecting to a large extent persisting cross-country price differences of non-standardised goods such as cars ([275]), for which sellers differentiate the retail or wholesale price across markets ([276]). Nevertheless, the further enlargement of the euro area (EA-19) reinforced overall price convergence across the euro area.

Graph IV.2: **Nominal exchange rate fluctuations (vis-a-vis the ECU)**
1970-1998
Selected group of countries



Percent change in nominal exchange rate vis-a-vis the ECU
Source: AMECO database.

([271]) The real effective exchange rate summarises, in one indicator, movements in (1) nominal exchange rates between a Member State and the rest of the euro area, (2) nominal exchange rates between a Member State and the rest of the world, as well as (3) inflation differentials between a Member State and both the rest of the euro area and the rest of the world. The introduction of the single currency eliminated the nominal exchange rate volatility between a Member State and the rest of the euro area, and this contributed to a reduction in the volatility of the real effective exchange rate (ceteris paribus).

([272]) See for instance Janus, T. and D. Riera-Crichton (2015), 'Real Exchange Rate Volatility, Economic Growth and the Euro', *Journal of Economic Integration*, Vol. 30, No. 1, pp. 148-17.

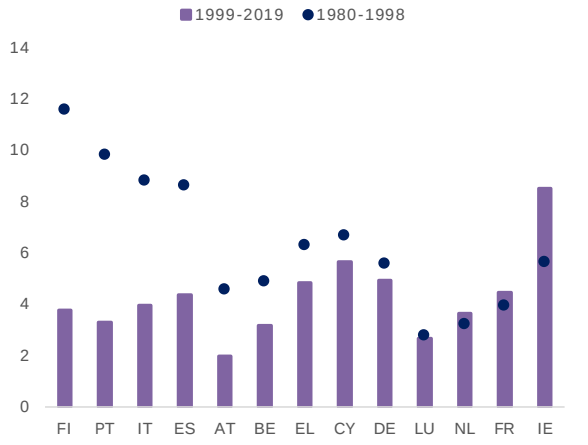
([273]) As measured by the coefficient of variation of price level indices which expresses the price level of a given country relative to a group of countries like EA-12 or EA-19. Price level convergence is to be distinguished from inflation convergence, which is discussed in the next subsection.

([274]) EA-11 includes EA-12 except LU – a small country with a disproportional impact on the indicator value.

([275]) For instance Dvir, E. and G. Strasser (2018), 'Does marketing widen borders? Cross-country price dispersion in the European car market', Journal of International Economics 112(C), pp. 134-149 report evidence for price differentiation in the European market for new passenger cars between 1993 and 2011, based on, e.g., regulatory (fuel tax), market (market power, market size) and climatic differences.. Other studies do not find significant price differences for standard goods sold through online retail outlets. See for instance Cavallo, A., Neiman, B. and R. Rigobon (2014), 'Currency unions, product introductions, and the real exchange rate', *Quarterly Journal of Economics*, Vol. 129, No. 2, pp. 529-595.

([276]) Furthermore, the stalling price convergence and even slight divergence among EA-12 over the past decade is actually largely driven by two Member States.

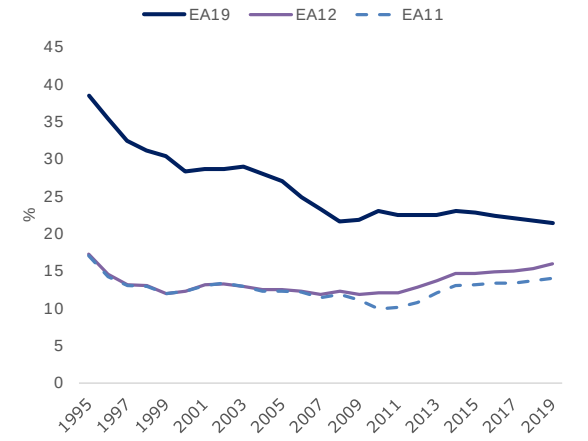
Graph IV.3: **Real effective exchange rate volatility**
(standard deviation)



Source: IMF IFS database.

All in all, the overall impact of adopting a single currency on product market price convergence is quite significant, with available studies ([277]) estimating that price dispersion is about 30 to 50% lower for countries in a currency union than for those with a fixed exchange rate.

Graph IV.4: **Price convergence Actual individual consumption**



(1) Coefficient of variation of price level indices. The price level index expresses the price level of a given country relative to a group of countries like EA-12 or EA-19. EA-11 is EA-12 excluding Luxembourg.
Source: Eurostat.

([277]) For instance Cavallo et al. (2014), *op cit.* study price developments in euro and non-euro EU countries as well as the US and countries using dollars. See also, Buti, M. and A. Turini (2015), 'Three waves of convergence. Can Eurozone countries start growing together again?', VoxEU.

IV.2.4. Price convergence in financial markets

Similarly, the adoption of the euro has also had an important impact on transaction costs in the financial markets. For instance, the costs for cross-border purchases of a euro bond or equity are estimated to have decreased since the launch of the euro by around 31% and 27%, respectively ([278]).

Besides directly benefitting savers over time through lower portfolio management expenses, these lower transaction costs should also help citizens to hold a more diversified portfolio of financial assets, implying that their savings and income from these savings will be less volatile overall. At the same time, however, this positive diversification effect has been partly offset by the relative increase in transaction costs for assets outside the euro area, which induced residents to invest relatively less in equities from outside the euro area ([279]).

Lower transaction costs also promote price arbitrage in financial markets, which (in combination with other structural reforms) helps to establish a more uniform cost of funding for firms across the currency area - thereby strengthening competition in the Single Market.

However, in the absence of adequate micro- and macro-prudential supervision, as was the case during the run-up to the global financial crisis, heightened capital mobility may amplify emerging instabilities and create significant negative spillover effects ([280]). Against this background, a number of measures, such as the establishment of the European Systemic Risk Board as well as the Single Supervisory Mechanism and Single Resolution Mechanism under the Banking Union, have been taken to address such vulnerabilities.

IV.3.Fostering macroeconomic stability

Membership of a currency union with a credible independent monetary authority benefits its

([278]) These reductions include lower transaction costs due to a harmonisation of legal systems across the euro area. See for instance Coeurdaciera, N. and P. Martin (2009), 'The geography of asset trade and the euro: Insiders and outsiders', *Journal of the Japanese and International Economies*, Vol. 23, No. 2, pp. 90-113.
([279]) See for instance Coeurdaciera and Martin (2009), *op cit.*
([280]) See for instance Allen, F, T Beck, E Carletti, P R Lane, D Schoenmaker, and W Wagner (2011), '*Cross-Border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies*', Centre for Economic Policy Research

Member States, as it lowers a country's inflation bias that may arise from the desire to push unemployment below its natural rate so that it is unable to commit to a low inflation rate in a credible way.

At the same time, Member States lose control over their domestic interest rate and nominal exchange rate, though such control in practice already had been limited for most Member States given their exchange rate commitment. Moreover, it is argued below that in a modern economy characterised by expanding global value chains and increasing foreign exchange balance sheet exposure to diversified risks, nominal exchange rates lose part of their effectiveness as an adjustment channel. However, such developments also put a stronger burden on internal adjustment mechanisms, such as wage setting.

Even so, the global financial crisis showed that when the business and financial cycles are not synchronised across euro area Member States, a common monetary policy may become less effective. Hence, it should remain a policy requirement to promote upward convergence towards resilient economies across the euro area ([281]), as this is crucial (but not sufficient) to improve the functioning of the Economic and Monetary Union and optimise the benefits of the euro ([282]).

IV.3.1. Price stability

Prior to the adoption of the euro, several Member States exhibited high and volatile inflation rates (Graph IV.5). While difficult to quantify, high inflation has several adverse effects such as 'shoe-leather costs' ([283]), a loss of purchasing power of non-indexed income ([284]), less innovation ([285]) and a reduction in net wealth if not anticipated ([286]). High inflation can furthermore reinforce social inequalities, as low-income households typically are less able to protect themselves against the erosion of their savings and income through financial instruments and other investments.

During the first 10 years following the euro's launch, Member States experienced lower inflation rates close to the European Central Bank's (ECB's) price stability objective of euro area inflation below, but close to, 2% in the medium term. For instance, average annual inflation ([287]) between 1980 and 1998 was 7% in Spain, 11.9% in Portugal and 15.3% in Greece compared to 2.9% in Spain, 2.6% in Portugal and 3.2% in Greece between 1999 and 2009.

While the decline and stabilisation of inflation also had a strong global dimension, the fact that the European Central Bank operates independently, under the primary objective of price stability, operationalised via a numerical formulation of price stability, likely has lent credibility to the institution and helped anchor inflation expectations in the euro area ([288]). By comparison, prior to the single currency, different monetary policy regimes existed in the individual Member States, with some Member States attaching less weight to price stability and favouring instead the achievement of output above its long-run potential.

However, since 2013, inflation in the euro area as a whole has been for the most part below the ECB's price stability objective. This limits the room for adjusting relative nominal unit labour costs of current account deficit countries but also limits the

([281]) See for instance Giudice, G., J.Hanson and Z. Kontolemis (2018), Economic Resilience in EMU, *Quarterly Report on the Euro Area*, Vol. 17, No.2, pp. 9-15.

([282]) See for instance Berti, K. and E. Meyermans (2018), 'Sustainable convergence in the euro area: A multi-dimensional process', *Quarterly Report on the Euro Area*, Vol. 16, No.2, pp. 9-23 .

([283]) I.e. the opportunity costs of holding cash when nominal interest rates increase in response to anticipated inflation. For instance, Calza, A. and A. Zaghini (2015), 'Shoe-leather costs in the euro area and the foreign demand for euro banknotes', *ECB Working Paper Series* No. 1824, estimate that between 2002 and the summer of 2007, the shoe-leather cost was about 0.08% of annual GDP per annum, while at the peak of the crisis it had risen to 0.22% of GDP. With overnight interest rates approaching 0% in subsequent years, shoe leather cost in the euro area were consequently close to zero.

([284]) Or income indexed only with a significant time lag, such as pension benefits.

([285]) For instance, using euro area and US data, Chua, A., Cozzi, G., Lai, C.-C. and C.-H. Lia (2015), 'Inflation, R&D and growth in an open economy', *Journal of International Economics*, Vol. 96, No. 2, pp. 360-374 estimate that a 1 percentage point increase in the inflation rate decreases the R&D share of GDP by about 0.4%. This outcome reflects the fact that R&D investments are more severely affected by liquidity requirements (i.e. cash in advance) than investments in physical capital and that inflation erodes the holding of money balances.

([286]) See for instance Table 1 in Fischer, S. and F. Modigliani (1978), 'Towards An Understanding of the Real Effects and Costs of Inflation', *NBER Working Paper* No. 303 for a summary of the real effects of inflation.

([287]) For the sake of comparison with pre-euro times, we use national CPI data instead of the Harmonised Index of Consumer Prices (HICP), to which the ECB's price stability objective refers to.

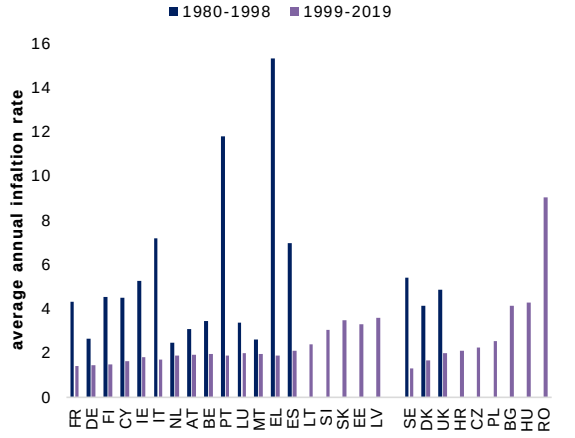
([288]) For instance, Alesina, A. and R. Barro (2002), 'Currency unions', *Quarterly Journal of Economics*, Vol. 117, No. 2, pp. 409–436 argue that when the inflation target set by national monetary authorities lacks credibility, rational economic agents will discount this in their price setting, and the actual inflation will be higher than the target rate.

room for deleveraging by both public and private debtors across the euro area ([289]).

IV.3.2. Limited benefits of nominal exchange rate flexibility

When a country becomes a member of a currency union, it can no longer adjust independently its nominal exchange rate if hit by an idiosyncratic shock ([290]). This may then pose a stronger adjustment burden on other parts of the economy, such as wages ([291]).

Graph IV.5: **Average annual inflation rate**



(1) No inflation rate for the 1980-1998 period for Member States joining the EU in 2004 or later.
Source: Authors' estimate based on AMECO database.

However, ongoing structural developments have made the nominal exchange rate a less effective adjustment tool. These developments relate to factors such as (i) the ongoing integration of domestic production tasks into global value chains, (ii) increased foreign currency balance sheet exposure, (iii) non-linear exchange rate pass-through and (iv) the ineffectiveness of national monetary policy to stabilise the nominal exchange rate in an interdependent world. Moreover, as discussed above, adopting the euro also eliminates nominal exchange rate fluctuations stemming from financial market shocks –that may generate important feedback loops to the real economy, especially in the short-to medium- run ([292]).

Nevertheless, with irreversibly fixed nominal exchange rates and a high degree of wage and price rigidity, a larger part of the adjustment burden shifts to quantities such as employment and output ([293]).

(i) Expanding global value chains ([294])

First, classical textbook analysis assumes that countries produce goods and services domestically, and that all production factors are remunerated in domestic currency. In such an environment, a country's international price competitiveness is improved unambiguously by a nominal exchange rate depreciation in the short term ([295]).

However, with falling transaction and coordination costs ([296]), patterns of international trade have changed in a profound way, giving rise to global value chains (GVCs) where the production process gets more fragmented and tasks get spread across several countries ([297]). In a GVC, a firm imports intermediary goods and services, creates value added and subsequently exports its output to the next chain of the GVC. Generally speaking, in the case of GVCs, exchange rate fluctuations have an ambiguous impact ([298]). That is, a depreciation will increase the cost of intermediary imports, while at the same time making the output more competitive in export markets. Moreover, as the euro area Member States are more involved in regional rather than global supply chains ([299]), fluctuations of

([289]) I.e., – to the extent this lower inflation was not expected when contracts were settled.
([290]) See for instance Friedman, M. (1953), *Essays in Positive Economics*, University of Chicago Press.
([291]) The same type of burden shift onto other nominal macroeconomic variables occurs also under alternative exchange rate regimes, like hard pegs or a fixed exchange rate, as was the case under the European Exchange Rate Mechanism prior to the adoption of the euro.
([292]) See for instance Hooper, P. and S. Kohlhagen (1978), 'The Effect of Exchange Rate Uncertainty on the Prices and Volumes of International Trade', *Journal of International Economics*, Vol. 8, pp. 483-511..
([293]) See for instance various issues of European Commission, 'Labour Market and Wage Developments in Europe'.
([294]) For a comprehensive analysis of the implications of GVCs for the euro area, see the ECB Working Group on Global Value Chains (2019), 'The impact of global value chains on the euro area economy', *ECB Occasional Paper* No. 221.
([295]) Provided that such depreciation is not retaliated by a devaluation of the trading partners' currency.
([296]) Driven by the ongoing digital revolution as well as the creation of euro-wide standards.
([297]) See for instance Baldwin, R. (2016), *The Great Convergence: Information Technology and the New Globalization*, The Belknap Press of Harvard University Press.
([298]) See for instance Schmitz, M., Fidora, M. and Gunnella, V. (2017), 'The impact of global value chains on the macroeconomic analysis of the euro area', Economic Bulletin, No. 8 and Georgiadis, G., Georgios, Gräb, J. and M. Khalil (2019) 'Global value chain participation and exchange rate pass-through', ECB Working Paper, No. 2327.
([299]) ECB Working Group on Global Value Chains (2019), *op.cit.*

national exchange rates within the area would especially be ineffective, while fluctuations of the euro vis-a-vis other exchange rates may produce real effects.

Even so, independently of GVC developments, a rising share of intermediary imports in exports observed across euro area Member States ([300]) also reduced the impact of nominal exchange rate adjustments on firms' competiveness.

It remains to be seen whether the increased trade tensions of recent years and the disruptive impact of COVID-19 on GVCs ([301]) will lead to some repatriation of production capacities and thus a weakening of GVCs.

(ii) More foreign exchange balance sheet exposure

Moreover, the capacity of national currencies to help absorb idiosyncratic shocks via a depreciation can furthermore be seriously undermined if domestic residents hold a significant amount of unhedged liabilities denominated in foreign currency ([302]).

In this case, a strong depreciation would significantly weaken the balance sheets of domestic banks, households and firms. As a result, distressed agents will save more, thereby reducing domestic demand that may offset any gains in foreign demand for goods and services induced by the depreciation.

By contrast, cross-border bank credit and transactions within a currency union are settled in the common currency, which means that it does not entail any foreign exchange balance sheet exposure but may help to diversify risks and stabilise domestic consumption ([303]) ([304]).

(iii) Non-linear exchange rate pass-through

Furthermore, the presumed opportunities stemming from a simple linear relationship between nominal exchange rates and competitiveness are less straightforward in practice. For instance, exporting to foreign markets may involve irrecoverable sunk costs such as expenditures for marketing, R&D, and the development of distribution networks. As such, sunk costs may make exports less responsive to nominal exchange rate adjustments – both in terms of entering and leaving the export markets ([305]).

Moreover, in non-perfectly competitive markets, like those resulting from the presence of investment sunk costs, firms operate pricing to market and tend to absorb the impact of exchange rate movements with changes to their cost markup.

(iv) More effective monetary policy coordination

In addition, since the launch of the euro, the Member States of the euro area have primarily been hit by common shocks, such as the great financial crisis and the COVID-19 pandemic. In such circumstances, a single currency and common monetary policy enable Member States to counteract more effectively common shocks than national monetary policies would.

Furthermore, while a loss of price competitiveness may widen a country's external imbalances, research ([306]) suggests that strong domestic demand growth fuelled by excessive credit growth has also been an important factor driving external imbalances in the past; and that external adjustment in deficit countries was achieved

([300]) See OECD (s.a.), 'Import content of exports' at https://www.oecd-ilibrary.org/trade/import-content-of-exports/indicator/english_5834f58a-en

([301]) See for instance Seric and Winkler (2020), 'COVID-19 could spur automation and reverse globalisation – to some extent' VoxEU.

([302]) As has been the case for several Eastern European countries. See, for instance, European Systemic Risk Board (2011), 'Recommendation of the European Systemic Risk Board on lending in foreign currencies', ESRB/2011/1.

([303]) See, for instance, Kontolemis, Z., Meyermans, E. and C. Uregian (2020), 'Consumption smoothing and the role of banking integration in the euro area', *Quarterly Report on the Euro Area*, Vol. 9, No. 2, pp.7-26.

([304]) Empirical analysis indeed suggests that a domestic currency with its exchange rate fixed to a foreign currency that has the status of an international currency, increases the residents' propensity to borrow in this currency, as the fixed exchange rate decreases balance sheet risks from currency depreciation.

([305]) Indeed, if these sunk costs were made with a view to export to foreign markets when the currency was depreciated, then firms may find it profitable to continue to export to that market when the exchange rate appreciates, i.e. trade hysteresis. See for instance Baldwin, R., and P. Krugman (1989), 'Persistent Trade Effects of Large Exchange Rate Shocks', *Quarterly Journal of Economics*, Vol. 104, pp. 634-55.

([306]) See for instance Comunale, M. and J. Hessel (2014), 'Current account imbalances in the Euro area: Competitiveness or financial cycle?', *De Nederlandse Bank Working Paper* No. 443

primarily through demand compression, rather than expenditure switching ([307]).

Moreover, available research suggests that whenever capital is freely mobile on a global scale, the global financial cycle constrains national monetary policies regardless of the exchange rate regime ([308]).

Nevertheless, while business cycles across Member States may be more synchronised with a common currency, their amplitude may diverge strongly as Member States' capacity to withstand shocks differs notably ([309]). This shows that the effectiveness of a common monetary policy can be strengthened by promoting convergence in Member States' capacity to withstand shocks and by completing the banking union and capital market union with a view to strengthening cross-border risk sharing ([310]) .

(v) Higher adjustment burden on quantities

At the launch of the euro, the expectation was that increased wage flexibility ([311]) as well as labour mobility ([312]) would facilitate domestic adjustment in the absence of nominal exchange rate flexibility.

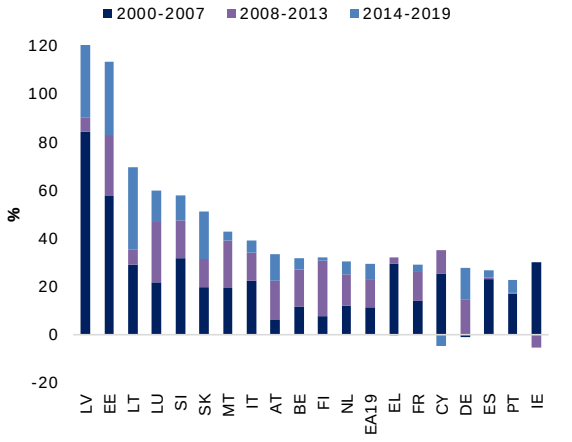
However, while in the run-up to euro adoption several Member States witnessed notable wage moderation, the adoption of the euro does not seem to have accelerated labour market reforms ([313]). As such, nominal unit labour cost growth behaved as a source of imbalances in the euro area in the run-up to the crisis. Several Member States, including Greece, Ireland, Portugal and Spain, recorded very strong nominal unit labour cost growth, while others, such as Germany and Austria, recorded very low or even slightly negative unit labour cost growth (see Graph IV.6) ([314]).

These developments distorted international competitiveness, contributing to unsustainable external imbalances that warranted sharp downward adjustments in unit labour costs. However, rigid wages hindered such a correction, and adjustment occurred mainly in terms of quantities such as employment and output ([315]).

IV.3.3. Incentives for structural reforms

Another expectation of the euro's launch was that joining EMU would facilitate cross-border risk sharing and would create more incentive for national structural reforms enabling Member States to better withstand asymmetric shocks.

Graph IV.6: **Nominal unit labour cost - cumulative growth**



(1) I.e. 2014-2019 cumulative growth not shown - break in series.
Source: Authors' estimates based on Eurostat, National Accounts.

However, the emergence of exceptionally low real interest rates during the first 10 years following the

([307]) See for instance Lane, P and G. Milesi-Ferretti (2012), 'External adjustment and the global crisis', *Journal of International Economics*, Vol. 88, No. 2, pp. 252-265.
([308]) See for instance Rey, H. (2018), 'Dilemma not trilemma: the global financial cycle and monetary policy independence', NBER Working Paper 21162.
([309]) See for instance Franks, J., Barkbu, B., Blavy, R., Oman, W. and Schoelermann, H. (22018), 'Economic Convergence in the Euro Area: Coming Together or Drifting Apart?', *IMF Working Paper* No 18. De Grauwe, P. and Y. Ji (2016), 'Flexibility versus Stability A difficult trade-off in the eurozone', *CEPS Working Document* No. 422.
([310]) See for instance Meyermans, E., Uregian, C., Van Campenhout G. and D. Valiante (2019), 'Completing the Capital Markets Union and its impact on economic resilience in the euro area', *Quarterly Report on the Euro Area*, Vol. 18, No. 4, pp. 27-39.
([311]) Wage flexibility entails two components, i.e. relative wage flexibility and absolute wage flexibility. The former is key for domestic resource reallocation, while the latter is key for competitiveness vis-à-vis the rest of the world.
([312]) Sectoral labour mobility is a channel mainly to increase productivity or accommodate a shift in preferences and technologies. Cross-border labour mobility is a channel mainly to absorb a local lack of aggregate demand.
([313]) Alesina, A., Ardagna, S. and V. Galasso (2008), 'The Euro and Structural Reforms', *NBER Working Paper* 14479.
([314]) Such developments during the early years of EMU were to a large extent driven by booms in domestic aggregate demand, fuelled by the easy availability of cheap credit for consumption and construction in some Member States See for instance Gros D. (2010), 'Europe's Competitiveness Obsession,' *CEPS Commentary.*
([315]) See for instance Izquierdo et al. (2017), 'Labour market adjustment in Europe during the crisis: microeconomic evidence from the Wage Dynamics Network survey', *ECB Occasional Paper* No. 192,

adoption of the euro was coupled – in some vulnerable countries – with credit bubbles, fiscal profligacy and misallocation of resources, and allowed countries to progress less vigorously with their structural reform efforts than originally expected ([316]).

In turn, the persisting long-standing structural weaknesses in some Member States prevented them from taking full advantage of these favourable financing conditions in a sustainable manner. That is, the incomplete architecture of euro financial markets facilitated excessive capital flows to the periphery countries to finance non-productive expenditures such as consumption and investments in residential buildings. These capital flows not only weakened the incentives to reform but were also unsustainable. In consequence, many of the potential benefits of the euro were lost.

IV.4. Effects of better market functioning and macroeconomic stability

At the launch of the euro, there was a general consensus that the common currency would improve market functioning. It was expected that the euro would increase trade volumes and change their composition, that it would direct capital to its most efficient use across the euro area and that it would support cross-border labour mobility ([317]). These developments would not only strengthen the euro area's growth potential, but would furthermore improve the resilience of the euro area economy given that, for instance, cross-border factor mobility is an important channel for absorbing idiosyncratic shocks in a currency union. In addition, a common monetary policy would also be more effective in the pursuit of price stability, as it allows monetary authorities to internalise better intra-European spill-overs and eliminates the spill-overs caused by currency substitution, with the German mark playing the role of the safe-haven currency.

Moreover, stronger cross-border trade, investment and employment opportunities in the wake of the euro's adoption were expected to have a domino effect on other EU Member States wanting to join the euro area. In turn, this euro area enlargement strengthened the incentives for incumbent members to remain in the area.

Overall, the available evidence suggests that there certainly have been improvements in intra-euro area trade, increased investment and capital flows, as well as some (albeit still limited) degree of labour mobility ([318]). However, markets did not always adjust to the extent expected, as briefly highlighted in the following subsections ([319]).

IV.4.1. International trade

First estimates ([320]) of the euro's impact on trade suggested an increase of about 5% following the launch of the common currency. However, as more data became available, results became more ambiguous, with estimates ranging from negligible ([321]) to increases in the intra-euro area trade by about 20%. ([322]) A recent meta-analysis reports the gains in trade between 2% and 6% ([323]).

([316]) See Fernandez-Villaverde, J., Garicano, L. and T. Santos. (2013), 'Political Credit Cycles: The Case of the Euro Zone', *NBER Working Paper* No 18898, and Franks et al., *op. cit.*, as well as Del Hoyo, J.L., Dorrucci, E., Heinz, F. and S. Muzikarova, 'Real convergence in the euro area: a long-term perspective', *ECB Occasional Paper* No. 203, December 2017.

([317]) See for instance Emerson et al. (1992), *op. cit.*

([318]) The lowering of transaction costs has a smaller impact on trade than on financial transactions where even hundredths of a percent cost savings can have a large impact, as argued by for instance Gros D. (2017), 'One Market, One Money – A Mistaken Argument (post factum)?', *CEPS Policy Insight* No 2017/05.

([319]) Here, it is important to recall that estimating the impact of the euro on market functioning poses important identification challenges such as distinguishing between the effects of the euro and the further deepening of the Single Market.

([320]) See for instance Baldwin, R., DiNino, V., Fontagné, L., De Santis, R. and D. Taglioni (2008), 'Study on the Impact of the Euro on Trade and Foreign Direct Investment', *European Commission Economic Papers* No. 321. See also Rose, A.(2000), 'One money, One Market: Estimating the effect of common currencies on trade', *NBER Working Paper* No 7432, p.10, which found a very strong positive effect of currency unions (approximately 200%) on bilateral trade, using gravity-based, cross-sectional data.

([321]) See for instance Figueiredo, E., L. Lima and G. Schaur (2016), 'The effect of the Euro on the bilateral trade distribution', *Empirical Economics*, Vol. 50, pp. 17–29. See also Berger, H., and V. Nitsch (2008), 'Zooming out: The trade effect of the euro in historical perspective', *Journal of International Money and Finance*, Vol 27, No.. 8, pp.1244-1260.

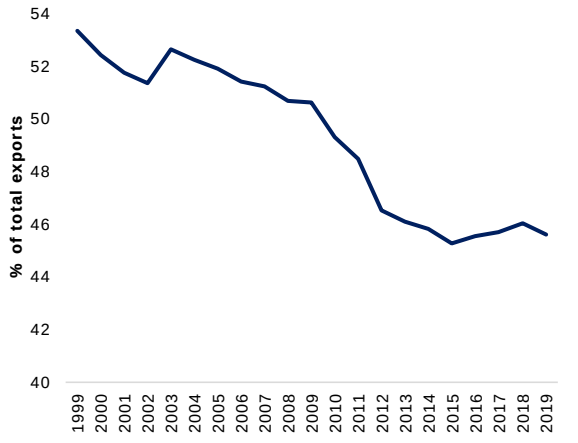
([322]) See for instance Kunroo, M., Sofi, A. and N. Azad (2016), 'Trade implications of the Euro in EMU countries: a panel gravity analysis', *Empirica*, Vol. 43, pp. 391–413.

([323]) See, Polak, P. (2019), 'The Euro's Trade Effect: A Meta-Analysis', *Journal of Economic Surveys*, Vol. 33, No. 1, pp. 101-124. Nevertheless, the issue is far from settled in the academic literature. For example, Rose, A (2016), 'Why Do Estimates of the EMU Effect on Trade Vary So Much?', *CEPR Discussion Paper* No. 11532 claims based on a meta-analysis that the euro trade effect is economically and statistically large, at about 50%. Rose (2016) suggests that the econometric results are to a large extent affected by the nature of the datasets used, as, for instance, the EMU effect is much stronger when the sample includes more than just EMU countries, as well as by identification problems as, for instance, global economic integration intensified at the same time.

Available studies also suggest strong differences across sectors and countries ([324]) as well as differences between intra- and extra-euro area trade ([325]) whereby the share of intra-euro area exports in total exports decreased notably from the euro's launch until 2015 (see Graph IV.7).

All in all, available research ([326]) seems to suggest an increasing heterogeneity in terms of production and specialisation across countries which may allow them to exploit better their comparative advantages. However, the same research also indicates that a lack of structural reforms hinders several Member States to exploit this potential to the fullest extent.

Graph IV.7: **Intra-euro area exports of goods – as % of total exports**



(1) 'Goods' covers all movable property including electricity
Source: Eurostat (International trade in goods (ext_go_agg)).

IV.4.2. Stronger capital flows and financial market integration

The elimination of the exchange rate risk through the introduction of the euro - together with legal and regulatory convergence - was an important factor supporting financial integration across the euro area ([327]). Financial integration was expected to strengthen the euro area's capacity to absorb shocks and promote potential growth by broadening the scope and opportunities for cross-border risk sharing ([328]).

Stronger opportunities for cross-border risk sharing

Well-functioning financial markets provide domestic consumers access to a more diversified income portfolio, not only consisting of labour and capital income from domestic assets but also income from foreign assets. In addition, cross-border retail-banking integration should enable credit flows supporting domestic consumption and investment even if local banks are adversely affected by a country-specific shock. Furthermore, well-integrated financial markets strengthen the transmission of the common monetary policy, which is crucial to stabilise the economy in the face of a common temporary aggregate demand shock.

Over the past 20 years, the euro has acted as a catalyst in the financial market integration process. For instance, available evidence suggests that investor holdings are biased toward their own currencies and that, except for large firms, most firms issue debt mainly in local currency ([329]). This home bias stems from factors such as the high fixed costs associated with borrowing in a foreign currency and exchange rate volatility ([330]). Thus, the common currency increased the available investment opportunities from an investor perspective and broadened the investor base from an issuer perspective. Indeed, studies analysing foreign direct investment (FDI) flows between 1985 and 2012 suggest also that euro area

([324]) See Felbermayr, G., Groschl, J., and I. Heiland (2018), 'Undoing Europe in a New Quantitative Trade Model', *IFO Working Papers* 250-2018

([325]) With the former being more sensitive to relative prices than the latter, see Bayoumi, T., Harmsen, R., and J. Turunen (2011), 'Euro Area Export Performance and Competitiveness', *IMF Working Paper* 11/140.

([326]) See for instance Mongelli, F., Reinhold, E. and G. Papadopoulos (2016), 'What's so special about specialization in the euro area? Early evidence of changing economic structures', *ECB Occasional Paper*, No. 168.

([327]) See for instance Kalemli-Ozcan, S, E Papaioannou, and J. Peydró (2010), 'What Lies Beneath the Euro's Effect on Financial Integration?' Journal of International Economics, Vol. 81, No. 1, pp. 75-88; Lane, P. (2006), 'Global Bond Portfolios and EMU', *International Journal of Central Banking*, Vol., No. 2, pp. 1-24 and Grochowska, A. and A. Hild (2019), 'Financial Union: Integration and Stability', *Quarterly Report on the Euro Area*, Vol. 18, No.2, pp. 7-41.

([328]) In a currency union, risk-sharing via financial markets is a crucial element to stabilise an economy, as it allows domestic consumption and investment to be de-coupled from domestic income and output in the face of idiosyncratic shocks. See for instance Kontolemis, Z., Meyermans, E. and C. Uregian (2020), *op cit.*, providing an empirical assessment of the impact of cross-border bank integration on consumption smoothing.

([329]) See for instance Maggiori, M., B. Neiman, and J. Schreger (2018), 'International Currencies and Capital Allocation', *Becker Friedman Institute Working Paper* No. 2018-30.

([330]) For instance, Fidora, M., M. Fratzscher and C. Thimann (2007), *op. cit.* estimate that a reduction in monthly real exchange rate volatility from its sample mean to zero reduces bond home bias by up to 60 percentage points, while it reduces equity home bias by only 20 percentage points.

membership has had an incremental positive effect on intra-euro area FDI growth, ([331]) with, on average, the adoption of the euro increasing FDI flows from other euro area Member States by 73.7% ([332]).

Capital misallocation and excessive debt levels

As such, the adoption of a common currency increased access to cross-border finance across the euro area. However, in the first decade of the euro, cross-border financial flows also gave rise to the cross-border financing of private consumption and non-productive investments such as residential buildings in several southern Member States, which was mainly driven by the lack of domestic financial market depth and liquidity ([333]).

Moreover, available research suggests that financial interlinkages within the euro area played a more prominent role in transmitting shocks than international trade. While a country is more likely to run a deficit if its major financial partners run surpluses (and vice versa), countries are more likely to run a current account surplus if their trade partners run a surplus ([334]).

At the same time, financial markets failed to discipline public borrowing, as risk premia for some sovereign borrowers did not reflect decreasing debt sustainability ([335]). This resulted in sharp adjustments in risk premia at the onset of the global financial crisis, which induced strong budgetary corrections in several Member States with high public debt levels ([336]).

IV.4.3. Cross-border labour mobility

Although the elimination of nominal exchange rate flexibility also increased the need for stronger movement of labour to absorb shocks and promote potential growth, ([337]) there is no evidence that suggests that the launch of the euro had a positive effect on labour mobility ([338]).

When an economy is hit by an idiosyncratic shock, cross-border labour mobility ([339]) should not only reduce unemployment in the home country but it may also increase domestic aggregate demand if part of the wages earned abroad is transferred to the home country and is used for domestic consumption. In turn, this may improve the fiscal position as unemployment benefits decrease and indirect tax revenues on domestic consumption increase ([340]). Moreover, if the migrant workers strengthen their skills and competences working abroad, the home country may benefit from a permanent increase in national productivity once the cross-border workers return ([341]).

However, available evidence suggests that cross-border labour mobility was a weak channel to offset the loss of nominal exchange rate flexibility in the face of shocks during the global financial crisis ([342]).

([331]) Brouwer, J., Paap, R. and Viaene, J.-M., 'The trade and FDI effects of EMU enlargement', *Journal of International Money and Finance*, Vol. 27(2), 2008, pp. 188-208; De Sousa, J. and Lochard, J., 'Does the Single Currency Affect Foreign Direct Investment?', *The Scandinavian Journal of Economics*, Vol. 113(3), 2011, pp. 553-578.

([332]) Carril-Caccia, F. and E. Pavlova (2018), 'Foreign direct investment and its drivers: a global and EU perspective', *Economic Bulletin Articles* 4.

([333]) See for instance Brunnermeier, M. and R. Reis (2019), 'A Crash Course on the Euro Crisis', *NBER Working Paper* No. 26229.

([334]) Hobza, A. and S. Zeugner (2014), 'Current accounts and financial flows in the euro area', *Journal of International Money and Finance*, Vol. 48, Part B, pp. 291-313.

([335]) See for instance Monteiro, D. and B. Vašíček (2018), 'A retrospective look at sovereign bond dynamics in the euro area', *Quarterly Report on the Euro Area*, Vol. 17 No. 4, pp. 1-16.

([336]) See for instance Meyermans E. (2019), 'Does market discipline enter governments' fiscal reaction functions in the euro area?', *Quarterly Report on the Euro Area*, Vol. 18 No. 1, pp. 7-26.

([337]) Farhi, E. and I. Werning (2014), 'Labor Mobility Within Currency Unions', *NBER Working Paper* No. 20105.

([338]) Cross-border labour mobility could increase as wages are denominated in euro and thus easier to compare, and less subject to unexpected exchange rate fluctuations.

([339]) Three types of labour mobility can be distinguished: i) long-term labour mobility, where citizens move their residence to a foreign country for at least 1 year to take up work or seek work, ii) cross-border mobility, where citizens reside in one country but are employed or self-employed in another and who, for this purpose, move across borders regularly, and iii) posted workers where employees who are regularly employed in one Member State are sent to another Member State by the same employer to work there for a limited period. For more details, see European Commission (2018), '2018 Annual Report on intra-EU Labour Mobility'.

([340]) See for instance Alcidi, C. and D. Gros (2019), 'EU Mobile Workers: A challenge to public finances?', contribution for informal ECOFIN, Bucharest, 5-6 April, 2019 .

([341]) However, cross-border labour mobility may reach its limits as an adjustment mechanism if it is associated with a major brain drain which could weaken the sending country's potential growth. In the past, high-skilled workers were most inclined to cross borders in several Member States.

([342]) See for instance Huart, F. and M. Tchakpalla (2015), 'Labour Mobility in the Euro Area During the Great Recession', mimeo. Confirming research on labour mobility done prior to the launch of the euro, such as Decressin, J. and A. Fatas (1995), 'Regional Labor Market Dynamics in Europe', *European Economic Review*, Vol. 39, No. 9, pp. 1627–1655.

Nevertheless, while cross-border labour mobility in the euro area is currently rather limited, it is expected to increase in the future as further structural reforms are implemented. Such reforms include, for instance, the further expansion of trans-European networks and the further modernisation of social security coordination rules covering areas such as sickness, maternity/paternity, family, old-age, unemployment and other benefits that are the exclusive responsibility of the national authorities ([343]). This once again illustrates the complementarity of the euro and structural reforms.

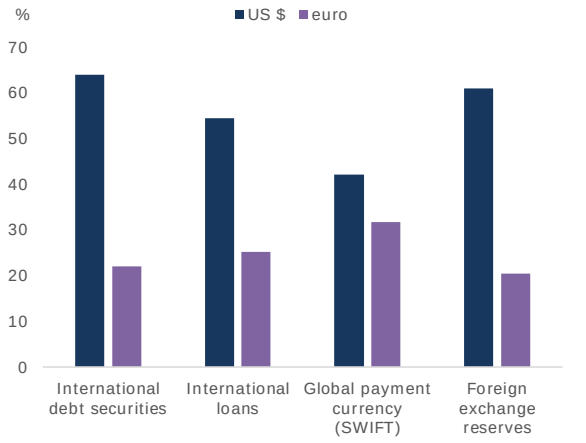
IV.4.4. International currency status

The euro has been a stable currency since its inception. This supports the attractiveness of the euro for worldwide use in trade and finance. For instance, in 2019, 61% and 62% of extra-euro area exports of goods and services were invoiced in euro, while for imports this share was 51% and 52% respectively ([344]).

It would be beyond the scope of this section to elaborate on all the benefits of the international reserve currency status of the euro ([345]) ([346]). From a microeconomic perspective, such a status has a direct advantage for firms and households, as it lowers transaction and hedging costs ([347]) and reduces balance sheets' sensitivity to exchange rate fluctuations because domestic firms and households need to borrow and lend less in foreign currency.

Furthermore, individual euro area Member States have to keep much lower foreign exchange reserves than if they had stayed outside the euro. This saves not only on the administrative costs to manage such reserves, but also on the opportunity costs related to the holding of low yielding reserves ([348]).

Graph IV.8: **The role of the euro in the international monetary system - 2019Q4**



Source: ECB (2020), 19th annual review of the international role of the euro.

Meanwhile, a further internationalisation of the euro combined with a move to multiple currencies for the settlement of international commodity prices could bring more stability to the prices in euro of imported intermediary inputs such as oil. This may then lessen the impact of exogenous shocks arising in foreign exchange markets on the euro area economy

At the same time, however, this could also have implications for the conduct and transmission of monetary policy in the euro area ([349]). For example, empirical research suggests that an increase in the share of the euro as an invoicing currency for extra-euro area imports of 10 percentage points would lower exchange rate pass-through to import prices by almost 7 percentage points ([350]).

IV.5.Strengthening the EMU architecture

The global financial crisis and the subsequent European debt crisis highlighted the incomplete nature of the EMU architecture and that Member

([343]) See for instance European Commission (2016), 'Questions and Answers on the revision of social security coordination rules'
([344]) See ECB (2020), The international role of the euro, June 2020.
([345]) See, for instance Gräb, J. and A. Mehl (2019), 'The benefits and costs of the international role of the euro at 20', Special feature 3 in ECB (2019), The international role of the euro.
([346]) See also European Commission (2018), 'Towards a stronger international role of the euro', COM(2018) 796 final and European Commission (2021), 'The European economic and financial system: fostering openness, strength and resilience', COM(2021) 32 final
([347]) A higher share of invoicing in local currency lowers the exchange rate risk and reduces the need for financial hedging.
([348]) See for instance Roger S. (1993), 'The management of foreign exchange reserves', *BIS Economic Papers*, No 38 and IMF (2015), Assessing reserve adequacy—specific proposals.
([349]) See for instance Cœuré, B. (2019), 'The euro's global role in a changing world: a monetary policy perspective', speech delivered at the Council on Foreign Relations, New York City, 15 February 2019.
([350]) See ECB (2015), 'The role of currency invoicing for the international transmission of exchange rate movements', in ECB (2015), 'The international role of the euro', Frankfurt am Main, July.

Sates' capacity to withstand shocks differs strongly. As such, the social and economic divergences between euro area members intensified sharply during the global financial crisis and this divergence was far from corrected when the recent COVID-19 pandemic broke out ([351]).

At the same time, policy responses at the euro area level were less effective in the absence of an appropriate balance between risk sharing and risk reduction. This led to an overly reliance on monetary policy for stabilisation purposes and an inappropriate policy mix, especially in the likely presence of a lower bound for policy interest rates ([352]).

Moreover, adjustment in the face of common shocks remains asymmetric as surplus countries face fewer constraints ([353]) In addition, in a currency union, with no national central bank acting as lender of last resort and no common fiscal stabilisation capacity, national financial markets may be vulnerable to a self-fulfilling flight to-safety ([354]).

Such developments severely hinder the euro area's capacity to exploit fully the benefits of the single currency; and they carry also the risk to weaken citizens' support for the euro ([355]).

All in all, addressing these challenges calls for stronger progress in completing a genuine Financial Union, achieving a more integrated Economic and Fiscal Union, and strengthening euro area institutions and accountability ([356]).

IV.6. Conclusions

In 1999, EMU was created with the expectation that it would bring significant benefits to the citizens of its Member States.

This section took a closer look at the main micro- and macroeconomic channels through which Member States were expected to benefit from the euro. While there is still scope to extend this review, the findings already highlight that measuring a country's benefits from the euro's adoption by a single statistic is not feasible, as it involves a complex set of interactions whereby the euro is part of a whole package of complementary reforms and policies such as the deepening of the Single Market, the completion of the Banking Union and Capital Markets Union and other institutional and governance reforms.

Thus, completing the architecture of the Economic and Monetary Union is urgently needed to allow its citizens to benefit from the euro's adoption to the fullest extent ([357]). In this respect, recent experiences with the EU's recovery plan in the wake of the COVID-19 pandemic, especially the Recovery and Resilience Facility (RRF) and Support to mitigate Unemployment Risks in an Emergency (SURE), seem to provide an opportunity for a further harmonised direction of economic and fiscal policy. This needs to be complemented by ambitious structural reforms at Member State level.

([351]) See for instance European commission (2020), 'Analysis of the euro area economy', Commission Staff Working Document, COM(2020) 746 final.

([352]) See for instance Buti, M., Deroose, S., Leandro, J. and G. Giudice (2017), 'Completing EMU', VoxEU

([353]) Buti et al. (2020), *op cit.*

([354]) See De Grauwe, P. and Y. J. (2013), 'Self-fulfilling crises in the Eurozone: An empirical test', *Journal of International Money and Finance*, Vol. 34, pp. 15-36

([355]) European Commission (2017), 'Reflection Paper on the Deepening of the Economic and Monetary Union'

([356]) Buti et al. (2020), *op cit.,* and Buti, M., Jollès, M. and M. Salto (2019), 'The Euro — A Tale of 20 Years: What Are the Priorities Going Forward?', *Intereconomics,* Vol. 54, pp. 65–72, Sondermann, D. (editor) (2019), 'Economic Structures 20 Years into the Euro', *ECB Occasional Paper* No. 224.

([357]) See also Draghi M. (2018), 'Europe and the euro 20 years on', speech delivered at Laurea Honoris Causa in Economics by University of Sant'Anna, Pisa, 15 December 2018.