ANALYSES OF THE CZECH REPUBLIC'S CURRENT ECONOMIC ALIGNMENT WITH THE EURO AREA

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CONTENTS

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I INTRODUCTION

In line with the Czech Republic's Euro-area Accession Strategy, the CNB together with the Czech Ministry of Finance regularly assesses progress in laying the groundwork for euro adoption so that the Czech government can set a target date for joining the euro area and a date for entering ERM II. The CNB's main analytical input to this assessment is the annual *Analyses of the Czech Republic's Current Economic Alignment with the Euro Area*.

Following the government's decision not to carry out the next assessment of the Czech Republic's fulfilment of the Maastricht convergence criteria and its degree of economic alignment with the euro area until 2020,[1] the CNB has prepared a brief biennial edition of the Alignment Analyses this year.

The core of this year's document is the **Overall Message of the Analyses**, which is based on the results of the traditional analyses, summarised in the charts and tables presented in the **Chartbook**. These analyses assess both the preparedness of the Czech economy to join the euro area and the economic and institutional situation of the euro area itself. The theoretical foundations, motivations and technical descriptions of each of the analyses are contained in a separate **Methodological Annex**, which is located as an e-document on the CNB website. In addition, this year's Alignment Analyses have been supplemented with three extraordinary **thematic analyses**, whose aim is to add a wider context to the issue of euro adoption and the functioning of the monetary union.

The analyses in the document focus on the usual range of topics without any ambition to assess other issues relevant to the Czech Republic's entry to the euro area. This document thus does not analyse in detail the impacts of the Czech Republic's joining the banking union, including the transfer of powers in the area of prudential supervision and resolution of credit institutions to the supranational level and the related economic and financial impacts, the costs linked with ESM membership and other – for example legal and political – aspects of joining the euro area. The consequences of changes to the process of ERM II entry, which is a pre-condition for euro area entry, are not considered either. The document does not examine the overall advantages and disadvantages of adopting the euro[2] and does not formulate recommendations on this step. The political decision on the date of entry into the euro area falls to the government of the Czech Republic.

The messages of the analyses have been illustrated graphically with arrows of different colours and directions.

The colour underlying the arrow gives information on the message of the indicator in terms of the risks associated with potential euro adoption in the areas analysed:

- relatively low level of risk associated with potential euro adoption
- economic risks associated with potential euro adoption
- neutral message

The direction of the arrow gives information on the change in the indicator since the previous (last year's) analysis:

- improved
- deteriorated
- neither improved nor deteriorated

[1] Based on Czech Government Resolution No. 834/2018.
[2] A description of the costs and benefits of potential euro adoption and the motivations for these analyses are contained in the *Analyses of the Czech Republic's Current Economic Alignment with the Euro Area 2018*, available on the CNB website: https://www.cnb.cz/en/monetary-policy/strategic-documents/euro-area-accession/

The assessment of the message of the indicator applies only to the results of a specific analysis in a selected area of the economy. Likewise, the direction of the arrow indicates only whether the situation in that area has improved, has stayed at approximately the same level or has deteriorated over the last year.

However, the message should in no way be interpreted as a CNB recommendation for the Czech Republic to adopt the euro, much less as the Czech Republic's final euro adoption decision. Similarly, a single summary indicator cannot be compiled by adding up the individual coloured indicators or arrows.

II OVERALL MESSAGE OF THE ANALYSES

Future adoption of the single European currency should further increase the benefits accruing to the Czech Republic from its intense involvement in international economic relations. Euro adoption will lead to the elimination of exchange rate risk in relation to the euro area and thus to a reduction in the costs of trade and investment.

Besides these benefits, however, euro adoption simultaneously entails risks arising from the loss of independent monetary policy and exchange rate flexibility. It is also associated with costs arising from new institutional commitments due to developments in the euro area, including the obligation to join the banking union or the ESM.

The key factors for the Czech economy will be its alignment with the euro area and its ability to absorb potential asymmetric shocks after losing its own monetary policy. The analyses presented in this document assess the similarity of the long-term trends, medium-term development and structure of the Czech economy to the euro area, including the similarity of monetary policy transmission. The ability of the economy to adjust by means of autonomous fiscal policy, flexible labour and product markets and the banking sector is also examined.

The analysed characteristics of the Czech economy as regards its economic preparedness to adopt the euro can be divided into three groups:

Indicators suggesting a relatively low level of risk associated with potential euro adoption in the area analysed

These have long included the high degree of openness of the Czech economy and its close trade and ownership links with the euro area. These factors provide preconditions for the existence of benefits of euro adoption, such as the aforementioned reduction in transaction costs and the elimination of exchange rate risk. The strong trade integration also fosters a high degree of alignment between the Czech and euro area business cycles, although that has decreased somewhat in recent years. Although the use of the euro in the Czech economy is gradually increasing, it is concentrated almost exclusively in the trade relations of the Czech business sector. The Czech koruna remains aligned with the euro with respect to the US the dollar, and inflation inertia is not a barrier to joining the euro area either. Some indicators are also suggesting preparedness for adopting the euro as regards the adjustment mechanisms of the Czech economy. They include some labour market indicators, which are signalling increasing labour market flexibility (in particular a high and rising rate of economic activity and, conversely, a low and falling long-term unemployment rate), and a stable banking sector resilient to economic shocks.

Indicators with a neutral message

These include small differences in the level of interest rates from the longer term perspective and the overall similarity of monetary policy transmission in the Czech Republic and the euro area. The Czech Republic differs from the monetary union average in some financial indicators such as depth of financial intermediation, private sector debt and the balance sheet structure of non-financial corporations and households, but this cannot be considered a disadvantage or a fundamental barrier to euro adoption. Labour market flexibility is improving in some respects but is still being reduced by the configuration of the tax and benefit system, which reduces the incentive for low-income groups in particular to return to employment. The Czech Republic's competitiveness score is also neutral, for example. The current Czech public finance situation contains positive and negative aspects. On the one hand, there is a favourable starting position and budget surpluses in total and structural terms. On the other hand, however, fiscal policy has much more often been procyclical than countercyclical in past years.

Indicators suggesting economic risks associated with potential euro adoption in the area analysed

They include a still unfinished process of real economic convergence of the Czech Republic towards the euro area; lower structural similarity also persists. Misalignment of the Czech and euro area financial cycles would remain a risk in the event of euro adoption. The main problem

as regards the adjustment mechanisms of the Czech economy is public finance sustainability, as population ageing and mandatory-expenditure-increasing measures are reducing the room for fiscal policy to play a macroeconomic stabilising role in the future.

Comparison of the similarity of the Czech economy with the euro area

An important indicator as regards the Czech economy's similarity with the euro area is the current degree of real convergence, which remains unsatisfactory. The unfinished process of long-term convergence towards the advanced euro area countries thus remains a barrier to early euro adoption. Although this process has resumed in all key indicators in recent years, the distance of the Czech Republic from the euro area average remains significant in most indicators. If the euro was adopted, domestic inflation could rise above the CNB's current 2% target due to equilibrium appreciation of the real exchange rate and convergence of the wage level.

The Czech Republic has been showing high correlations of economic activity with the euro area over the last ten years. This holds true especially in comparison with the other non-euro area countries. Nevertheless, the cyclical alignment of the Czech economy with the euro area has been decreasing recently, as can be seen from their different GDP growth paths and lower dependence of Czech exports on economic developments in the euro area. A continuation of this trend would reduce the likelihood that the ECB's single monetary policy will be appropriately configured from the perspective of the Czech economy.

There are still differences in the structure of the Czech economy compared with that of the euro area, consisting mainly in an above-average share of industry in GDP. As regards euro adoption, the lower structural similarity poses a risk of possible asymmetric shocks, to which the single monetary policy would not be able to respond in full.

By contrast, the Czech Republic's strong trade and ownership links with the euro area have long been one of the strongest arguments for it joining the euro area. The elimination of exchange rate risk and transaction cost savings upon euro adoption would be greatly beneficial to Czech exports and imports. The relatively high intensity of international economic relations from the perspective of intra-industry trade is meanwhile fostering greater synchronisation of economic shocks and cyclical alignment and hence lower costs associated with the loss of independent monetary policy. Alignment is also being supported by a high level of ownership links with the euro area in terms of investment from euro area countries in the Czech Republic.

The alignment of the Czech and euro area financial cycles has not increased significantly year on year. The financial cycle indicator for the Czech Republic stopped rising in 2018, due in part to monetary and macroprudential policy tightening by the CNB. By contrast, the ECB's still accommodative monetary policy helped the euro area move further into the expansionary phase of the financial cycle. The different phases of the Czech and euro area financial cycles and the significant and growing heterogeneity across euro area countries may pose a risk to the Czech economy as regards euro adoption, as the single monetary policy acting in countries with different financial cycles could trigger an increase in financial risks and the emergence of imbalances in the Czech economy. This would increase the pressure on the CNB's prudential policy.

The growing short-term interest rate differential between the Czech Republic and the euro area indicates that the ECB's monetary policy would not fully meet the needs of the Czech economy in the current phase of the cycle. This development mainly reflects the ECB's still very accommodative monetary policy and the easing thereof in response to the deteriorating economic outlook for the euro area countries. By contrast, the CNB has tightened its monetary policy over the last two years by repeatedly increasing interest rates to a current level of 2%. Nevertheless, interest rates will probably become more aligned in future years as real shocks gradually spill over from the euro area to the Czech Republic. In the long run, koruna interest rates are close to euro ones, so the risk of there being a large shock associated with interest rate convergence upon euro adoption remains relatively small.

The Czech currency reacts to changes in the environment outside the euro area similarly to the euro, indicating a high degree of alignment. The correlation between the koruna-dollar and

euro-dollar exchange rates is higher than the correlations of other currencies in the region. The volatility of the koruna-euro exchange rate naturally increased following the exit from the exchange rate commitment but is the lowest among the Central European currencies under review. The results of the analyses of financial market convergence also rank the Czech Republic among the countries with a higher degree of alignment with the euro area. Moreover, the alignment of the individual segments of the Czech financial market with the euro area has long been gradually increasing.

The depth of financial intermediation and the level of private sector debt in the Czech Republic are well below the euro area average. However, the latter does not represent a level to which the Czech financial sector should converge, as the previously overleveraged private non-financial sectors in many euro area countries have been going through a deleveraging process for many years now.

The structural similarity of the balance sheets of Czech and euro area firms has increased slightly, while the similarity of the balance sheets of Czech and euro area households has decreased somewhat. The increase in similarity in the corporate sector was fostered again by an increase in loans and a decrease in the share of other accounts payable of firms in the Czech Republic. By comparison with the other countries under review, however, the balance sheet similarity of Czech and euro area firms remains relatively low. The decrease in the similarity of households' balance sheets is due mainly to a rise in the significance of units and shares in Czech households' total assets (at the expense of currency in circulation and deposits) and a decline in their share for euro area households. The persisting differences in the balance sheet structure of households and firms in the Czech Republic and the euro area may imply different sensitivities to a change in interest rates and hence to the single monetary policy.

Monetary policy transmission through the interest rate channel in the Czech Republic and the euro area in terms of the interest rate fixation structure of loans is more similar than before. Loans to household for house purchase have shifted towards longer fixation periods in both the Czech Republic and the euro area. This is fostering greater similarity of monetary policy transmission. At the same time, it may imply a decrease in the sensitivity of client rates to changes in short-term market rates. Fixation periods have also increased slightly for loans to non-financial corporations in the Czech Republic and the euro area. However, most non-financial corporations in the countries under review still take out loans with floating rates or rates fixed for up to one year. This implies relatively fast transmission of changes in monetary policy rates and subsequently market rates to loan rates in this segment. Transmission through the various channels works with different intensities in the Czech Republic and the euro area, as indicated by differences in the spread between client rates on loans to non-financial corporations and the overnight interbank rate. This spread is larger in the euro area than in the Czech Republic and has a slightly different structure, reflecting greater heterogeneity of euro area countries' risk premia on the one hand and a smaller difference in Czech government bond yields relative to the money market on the other.

The Czech economy has long been characterised by gradually rising use of the euro by non-financial corporations. This is due to the Czech Republic's high trade integration with the euro area and to natural hedging against exchange rate risk. In addition to rising drawdown of euro-denominated corporate loans, which has recently been significantly motivated by a widening of the positive interest rate differential in the Czech economy vis-à-vis the euro area, the share of the euro in domestic payments by firms has increased in the past. In the case of Czech households, by contrast, euroisation has long been low.

Adjustment mechanisms of the Czech economy

Although the starting position of Czech public finances is favourable, the medium- and long-term fiscal policy outlooks cannot be assessed positively in terms of the effectiveness of adjustment mechanisms. The Czech Republic has so far been comfortably compliant with the Maastricht criteria, and its government debt-to-GDP ratio is falling. More problematic, however, is the gradual deterioration in its overall and structural balance – primarily reflecting growth in mandatory expenditure – in a situation of continued still solid economic growth. The currently procyclical nature of Czech fiscal policy is at odds with the stabilising function that fiscal policy should perform. Moreover, it reduces the room for discretionary fiscal policy in the future, especially in the event of an

economic slowdown or asymmetric shocks. Czech public finance sustainability also remains unresolved. The Czech Republic is not using the good times to carry out crucial reforms of its pension and health systems, reforms that seem necessary to ensure their sustainability. Moreover, pension system legislation approved recently is fostering a significant deterioration in the pension system balance.

Labour market indicators have been improving in recent years mainly because of the favourable phase of the business cycle, but there are also signs of a gradual rise in labour market flexibility. This applies to most of the areas under review. The increasing labour market flexibility is being fostered mainly by a still gradually rising share of foreign nationals in the population and a higher share of part-time jobs. However, the deep unemployment and low-income traps caused by the configuration of the tax and social benefit system remain a negative aspect. The Czech Republic is still one of the better-scoring countries under review as regards overall competitiveness.

The Czech banking sector has maintained high profitability, a good liquidity position and favourable capitalisation and hence a high level of resilience to potential adverse shocks. The entire domestic financial sector showed favourable developments in 2018, recording growth in all segments. It would therefore be able to perform its function as an adjustment and stabilisation mechanism in the event of euro adoption. Nonetheless, a spiral between property prices and property purchase loans remains the main source of risk to the banking sector. Based on this situation, the European Systemic Risk Board issued a warning for the Czech Republic citing medium-term risks associated with the Czech residential property market and mortgage lending.[3]

Situation in the euro area

Economic growth in the euro area has slowed over the last year; moreover, a number of structural problems persist in the euro area. Despite the slowdown, the labour market situation continues to improve, with the unemployment rate still falling. However, the level of economic development in the euro area countries remains uneven. Euro area public sector accounts have seen a positive shift in recent years, but public debts remain high and governments in most countries have little room to respond to negative economic shocks with fiscal stimuli. Although the ECB ended its net asset purchase programme at the end of last year, government bond yields have declined this year, reaching new historical lows in most countries. This reflects an increase in uncertainty connected with the economic growth outlook and expectations of further monetary policy easing by the world's major central banks.[4] Together with long-term yields, rates on client loans in the euro area have fallen slightly further. Headline consumer price inflation in the euro area countries has been rather volatile over the last year, reflecting movements in energy prices. Their positive contribution has largely faded out at the year-end, causing headline inflation to decrease. Core inflation remains around 1% and its dispersion across countries reflects differences in wage growth, among other factors.

The work of the EU and particularly of the euro area on deepening integration, especially in the area of economic and fiscal policies necessary for safeguarding its sustainability and prosperity, has seen no substantial progress in 2019. Most of the measures recommended in the 2015 "Five Presidents" report and the Commission's 2017 paper on the deepening of the EMU have yet to be adopted.[5] Based on these documents, the December 2018 Eurosummit set out five

[3] Besides the Czech Republic, the ESRB issued warnings for Germany, France, Iceland and Norway. It also issued recommendations for Belgium, Denmark, Finland, Luxembourg, the Netherlands and Sweden. These countries had been warned in the previous assessment in 2016 but, according to the ESRB, had not responded sufficiently.

[4] Monetary policy has indeed been eased in the second half of this year. The US Federal Reserve has cut its rates three times (in July, September and October) and the ECB has renewed its net asset purchase programme and lowered its deposit rate further into negative territory (in September).

[5] In the area of economic policy, the report proposed the adoption of legally binding and enforceable rules for the implementation of structural reforms to achieve greater economic convergence, as well as the creation of national (advisory) competitiveness authorities and the strengthening of the Macroeconomic Imbalance Procedure. It also called for the completion of the banking union, including the launch of a European Deposit Insurance Scheme

priorities for further work: (i) the setting of the key aspects of a budgetary instrument for euro area countries, (ii) progress in the negotiations on the EDIS, (iii) the completion of the European Stabilisation Mechanism (ESM), (iv) the adoption of a legislative Banking Package and (v) the strengthening of the international role of the euro. The budgetary instrument for the euro area has recorded the greatest progress in 2019.[6] The EDIS has been under discussion throughout the year, mostly at an expert level.[7] However, formal political negotiations on its establishment have not yet started. As regards the reform of the ESM, the submitted changes to the relevant legislative texts have yet to be approved even though political agreement was reached at the end of 2018. The issue of the common backstop for the Single Resolution Fund is also unresolved, as the amount of funds and the option of introducing the SRF earlier are both still being discussed. By contrast, a compromise has been achieved in the negotiations on the Banking Package[8] aimed at reducing risks. No substantial progress has been made regarding the initiative to strengthen the international role of the euro.

Most of the measures proposed in the above strategy documents thus remain unrealised, mainly due to persisting fundamental differences of opinion between individual euro area member states. Advisory competitiveness authorities and European and national fiscal boards have been created. Supervisory and resolution pillars of the banking union have been established. Some measures to create a capital markets union have been adopted. The other initiatives are in the legislative process or concrete proposals have not yet even been submitted. The risks arising from the sovereign exposures and high public debt of some member states remain an unresolved problem. The system of economic policy coordination in the euro area continues to suffer from a low degree of compliance with legally non-binding – and therefore unenforceable – recommendations. Insufficient compliance with the fiscal rules of the Stability and Growth Pact remains unsatisfactory as well. In 2019, Italy's fiscal policy was the biggest subject of debate in this regard.

An important factor that continues to strongly affect all areas of European policy is the UK's process of withdrawal from the EU. The UK is due to leave the EU on 31 January 2020 at the latest.[9] At the end of October 2019, the EU Council adopted a decision on the latest (the third) extension of the exit date at the UK's request.[10] If a withdrawal deal is ratified by the end of January 2020, the risk of a disorderly exit of the UK from the EU will be eliminated. Given the further postponement of Brexit itself, however, the risks associated with the negotiations on future relations are increasing, as for these negotiations the withdrawal agreement assumes a transition period

(EDIS), the establishment of a capital markets union and a review of the current regulatory treatment of bank exposures to sovereign debt. As regards fiscal policy, the report proposed the creation of an advisory European Fiscal Board and, in the longer term, the establishment of a fiscal stabilisation function for the euro area and a "euro area Finance Ministry" to administer the common EMU budget. The proposed changes should be complemented by greater democratic accountability and legitimacy, including a stronger role of the European Parliament, changes to primary EU law and the unification of euro area representation in international organisations. The Commission's 2017 reflection paper on the deepening of the EMU adds the ideas of introducing a common euro area bond (a "European safe asset"), establishing a European Monetary Fund and setting up the post of "euro area Finance Minister" to the above proposals.

[6] In October, the Eurogroup reached political agreement on the key parameters of the focus, form and functioning of the budgetary instrument for convergence and competitiveness in the euro area (BICC). This agreement was subsequently incorporated into proposals for legislative texts, which are currently being discussed at the technical level. A proposal for a convergence and reform instrument (CRI) was submitted together with the proposals for the BICC. The CRI should have a similar function as the BICC but apply to non-euro area countries. The work on the CRI is in an earlier phase than that on the BICC.

[7] A report was submitted to the Eurogroup and then to the European Council following expert discussions. On the basis of the report, further steps should be approved at the highest political level.

[8] The Banking Package contains two regulations and two directives on bank capital and liquidity requirements (amendments to the CRR and the CRD) and on bank resolution (amendments to the BRRD and the SRMR).

[9] We base our analysis on the state of affairs at the beginning of December 2019.

[10] Before the European Council meeting on 17 October 2019, UK and EU negotiators agreed on a revised withdrawal deal in the section on the Irish backstop and in the political declaration on future relations. However, the UK House of Commons refused to ratify the withdrawal deal in the form and time frame submitted by the UK government. Approval of the withdrawal deal now depends primarily on the internal political situation in the UK.

during which the UK will in principle be viewed as an EU member and its citizens as EU citizens. This period, which will end on 31 December 2020, would have been almost two years had the original Brexit date been kept. However, it currently seems very short to thoroughly discuss with the UK all relevant areas of future relations and to ratify a final agreement in the European Parliament, the EU Member States and the UK. In view of the process of approving the mandate for EU negotiators, it can be assumed that the actual negotiations on the future relationship with the UK will only start in early March 2020, and if the transition period is not extended, the whole process should be completed by October 2020 so that the agreements reached can be ratified in time. The exit of the UK from the EU will affect, among other things, coalition-making between EU members, including relations between euro area members and non-members.

Great attention should be paid to the euro area member states' demand that countries wishing to enter ERM II must simultaneously join the banking union. This approach, first applied to Bulgaria in 2018, was then also applied to Croatia, which submitted a request for ERM II entry in 2019. The new approach was confirmed as admissible by the Council legal service. In its opinion, the Council legal service considers the condition of banking union entry to be objective and automatically applicable to all future applicants for ERM II entry, i.e. potentially including the Czech Republic. However, the CNB disagrees with this approach, does not regard the condition of banking union entry as legally binding for ERM II entry, and continues to assume that the Czech Republic will enter the banking union on the same date as adopting the euro. So, even though the CNB considers the legal framework to be unchanged, neither the de facto situation confirmed by the two aforementioned cases, nor the risks it entails for the Czech Republic can be ignored. Given the recent developments, it is likely that the euro area member states will require all other states seeking to join ERM II in the future to enter the banking union simultaneously. However, according to the updated *Impact Study of Participation or Non-participation of the Czech Republic in the Banking Union*,[11] membership of the banking union prior to euro adoption is disadvantageous for the Czech Republic.

The impacts of the above-mentioned situation on the Czech Republic and other EU countries will have to be taken into account in the Czech Republic's future decision on the timing of joining the monetary union. It is still necessary to assess properly the functioning of the new institutions and regulations created in past years in response to the economic and financial crisis, as they have fundamentally changed the form of the euro area and hence also the content of the euro adoption obligation assumed by the Czech Republic on acceding to the EU. Moreover, the reform of the euro area is still unfinished. Likewise, account should be taken of other implications of potential euro area accession, such as the direct costs of participating in the euro area's rescue mechanisms, the limits imposed on national powers in the banking supervision area and the risks associated with potential fiscal problems in certain euro area member states and the vulnerability of their financial sectors.

The fact that the euro area may not be an optimum currency area for all its member countries[12] should also be taken into account. This is reflected in an absence of sufficient convergence of these countries to the other euro area member countries, which may discourage EU Member States still outside the euro area but obliged to adopt the euro in the future from deciding on the timing of euro area entry. Some other factors may have a similar effect, such as the fact that the performance of euro area economies depends fundamentally on the different quality of their institutions, which is not directly affected by the organisation of the euro area (or euro area membership).

[11] An update of the *Impact Study of Participation or Non-participation of the Czech Republic in the Banking Union* (Ministry of Finance 2016) was prepared by the Ministry of Finance in cooperation with the Ministry of Foreign Affairs, the Office of the Government and the Czech National Bank and was discussed by the Czech government on 30 May 2016.

[12] For further details, see section III.2 *Synchronisation of economic activity in EU countries*.

III THEMATIC ANALYSES

1 AN ESTIMATE OF SELECTED MACROECONOMIC IMPACTS OF HYPOTHETICAL EURO ADOPTION THROUGH THE LENS OF THE CNB'S FORECASTING MODEL

Jan Brůha, Jaromír Tonner

According to estimates made using a dynamic general equilibrium model, hypothetical euro adoption in the Czech Republic and the resulting loss of independent monetary policy and elimination of exchange rate risk would on the one hand have negative impacts in the form of increased volatility of nominal variables – such as inflation – due to the loss of the stabilising role of independent monetary policy; on the other hand, it would have a slightly positive effect on real variables such as real GDP, owing mainly to growth in trade with the euro area resulting from the elimination of exchange rate risk. The simulation focuses solely on selected macroeconomic impacts and does not assess all the implications and impacts of hypothetical euro adoption, such as its effects on the budget and fiscal policy or its institutional impacts. As a result, the simulations presented below cannot be used to formulate a recommendation on the advantages and disadvantages of adopting the euro in a specific economic and political context.

The aim of this article is to obtain a model-based estimate of selected macroeconomic costs and benefits arising on the one hand from the loss of independent monetary policy and on the other from the elimination of exchange rate risk due to hypothetical euro adoption in the Czech Republic. Other costs and benefits (due, for example, to the technical switch from the koruna to the euro, the change in credibility and new institutional obligations affecting the budget and fiscal policy) are not the subject of this analysis. The analysis simulates ERM II entry at the start of 2007 and euro adoption in January 2009.[13] It is based on the assumption that the notification of ERM II entry and preparations for euro adoption would have been credible and transparent and that the future exchange rate path during the stay in ERM II would have been fully expected by economic agents. Although the exchange rate should stay within a band around the central parity during this period, revaluation of this parity is tolerated. The simulation assumes gradual appreciation of the koruna against the euro by 30 hellers in each quarter of the Czech Republic's stay in ERM II.

The simulations were conducted using a dynamic macroeconomic general equilibrium model. It was based on the g3 model, which has served as the CNB's core prediction model[14] for the past ten years and whose ability to faithfully reflect economic reality has been tested in practice.[15] A modified version of g3 was constructed to simulate the macroeconomic situation that would have arisen had the Czech Republic adopted the euro in the past. This modification consisted mainly in replacing the domestic monetary policy reaction function with the ECB's monetary policy and removing non-fundamental exchange rate shocks. Structural shocks identified by the g3 model in the period under review were inserted into this modified model. However, monetary policy and exchange rate shocks were omitted, as they would not have occurred had the Czech Republic been a euro area member. Moreover, the effect of nominal convergence was added to the simulations using the modified model, because after euro adoption this could not have occurred via the exchange rate and would have manifested through the inflation differential. The expected positive impact on trade was also included in the simulations. The latest empirical literature was used to estimate its size (the level

[13] The simulation thus assumes that the Czech Republic joined the euro area on the same date as Slovakia. For the purposes of the simulation, the hypothetical entry date was set with respect to the availability of a sufficiently long time series of economic data. In reality, entry to the euro area would not have been legally or politically possible for the Czech Republic in 2009 given the state of fulfilment of the Maastricht criteria and the political reality, as expressed, for example, in relevant government documents.
[14] Andrle at al. (2009)
[15] Brůha et al. (2013)

of Czech exports increased by around 8% in 2009, i.e. at the time of hypothetical euro adoption).[16] The hypothetical paths of the main macroeconomic variables, which can be compared with the actual paths, were simulated in this way.

In the model, hypothetical euro adoption would lead to higher and more volatile inflation, while the impacts on real output and consumption would be slightly positive. The higher inflation volatility (see Table 1) is a bad thing for economic agents, as it implies higher costs in the form of frequent price changes and makes long-term planning difficult. The higher inflation is caused by the fact that after euro adoption, nominal convergence does not occur through nominal appreciation, so the inflation differential remains the mechanism through which nominal convergence takes place. The nominal appreciation of the koruna during the Czech Republic's stay in ERM II would slightly offset the inflation pressures stemming from the converging domestic economy. The higher inflation volatility is due to the loss of independent monetary policy, as the ECB's single monetary policy cannot respond to purely domestic shocks in individual euro area economies. The positive effects on the real economy (see Table 1) arise mainly from the estimated growth in international trade resulting from the elimination of exchange rate risk, but they also reflect the temporary effect of lower real interest rates.[17] The model calculations are consistent with the observed data and the results of empirical analyses for Slovakia, which is a suitable comparison given its similarity with the Czech economy (high share of industry, high openness, ongoing nominal and real convergence).[18] The qualitative findings of this simulation, i.e. a slightly positive effect of euro adoption on real variables at the cost of increased volatility of nominal variables, are supported by a comparison of the unconditional variance of the variables implied by the two models.[19]

Table 1: GDP growth and inflation statistics
Actual situation versus simulated path for hypothetical euro adoption in 2009

		Actual situation (2002-2008)	Actual situation (2009-2017)	Simulation (2009-2017)
GDP	mean	4,3	1,7	2,3
	standard deviation	3,0	3,8	3,2
Inflation	mean	2,1	1,1	3,0
	standard deviation	2,5	1,6	2,9

Note: The table summarises the mean and volatility of the quarterly increases in real GDP and the CPI for the given periods. Volatility is measured using the standard deviation.
Source: CZSO, CNB calculations.

The estimates of selected macroeconomic impacts of euro adoption using the g3 model are limited to selected mechanisms and cannot include other relevant impacts. The simulation findings reflect the effects of the mechanisms modelled, i.e. the existence of costs of the loss of independent monetary policy and a flexible exchange rate as an adjustment mechanism on the one hand, and the elimination of exchange rate risk on the other, and are not too dependent on the expected euro adoption date. On the other hand, the simulations cannot capture effects stemming from one-off or random events and the effects of policies that are exogenous to monetary policy

[16] The calibration is taken from Felbermayr et al. (2018), which is the state of the art as regards the empirical literature. However, there are other studies that find a negligible impact of euro adoption on trade (e.g. Mika and Zymek, 2018). If we abstracted from the favourable effects of euro adoption on trade, its positive impacts on the real economy would be smaller (see Brůha and Tonner, 2018). The view of the effects of a single currency on trade in the empirical literature is discussed in more detail in the *Methodological Annex*.
[17] More detailed information and additional sensitivity scenarios are contained in Brůha and Tonner (2018).
[18] An ex post empirical study for Slovakia (Žúdel and Melioris, 2016) finds positive impacts on the real economy. Also, the finding that nominal appreciation during the stay in ERM II probably reduced the impacts of euro adoption on the volatility of Slovak inflation is consistent with the above results of the Czech Republic's simulated entry into the euro area.
[19] See Brůha and Tonner (2018).

(such as the reaction of budgetary policy to possible fiscal transfers in the euro area). It is the role of economic policy-makers to assess the relative importance of the macroeconomic costs and benefits associated with euro area entry by comparison with the other impacts of adopting the single currency.

2 SYNCHRONISATION OF ECONOMIC ACTIVITY IN EU COUNTRIES

Oxana Babecká Kucharčuková, Jan Brůha

An analysis of economic synchronisation in EU countries over the last 20 years indicates that economic activity is mutually aligned in most EU countries. The synchronisation of converging Central European economies rose substantially after EU accession and is no longer a barrier to euro adoption.

Economic synchronisation is an important indicator for assessing the costs and benefits of adopting a single currency. Low alignment of economic activity between the countries of a monetary union, especially with regard to business cycles, would indicate that those countries face different structural shocks and the single monetary policy may not be appropriate for some of them, as it may be unable to smooth their economic fluctuations. The evolution of synchronisation between existing members of a monetary union in turn indicates how the union works in terms of economic alignment. Strong divergence in the dynamics of economic activity in the countries of the monetary union would mean that the union is not an optimum currency area for some of its members or that its institutions have not been set up appropriately.[20] That could naturally make the union less attractive to countries considering joining it.

This analysis focuses on assessing the synchronisation of economic activity and change therein in EU countries. For these purposes, economic activity is measured by real GDP in the national currency. Both real GDP growth and its cyclical component determined using a statistical filter are employed.[21] Quarterly national accounts data for 1996–2018 are used. The analysis employs the principal component method with time-varying parameters. The first principal component represents the joint dynamics of economic developments in the EU. Synchronisation of economic activity is measured using the correlation of the country's time series with the first principal component. The method allows for change in the parameters of the principal component calculation (and therefore also the correlation) over time,[22] enabling change in synchronisation over time to be modelled over time as well. This may be of particular importance for the converging economies of Central Europe, where the convergence process and deeper integration of these economies into foreign trade can be expected to foster gradually rising synchronisation.[23]

Economic activity in France, Belgium, the Netherlands and Austria shows the highest mutual synchronisation over the entire period under review. GDP growth in these countries displays a very high and stable correlation with the first principal component. Economic activity in these euro area core countries can therefore be said to be fully synchronised.[24] Economic activity in Germany was somewhat less synchronised with this principal component before 2002. However, its synchronisation subsequently rose markedly, so economic developments in Germany have also been aligned with the above group of countries in recent years.

By contrast, the Greek economy is the least synchronised with the rest of the EU. This is not limited to the effect of post-crisis developments and related fiscal problems, as Greece was relatively

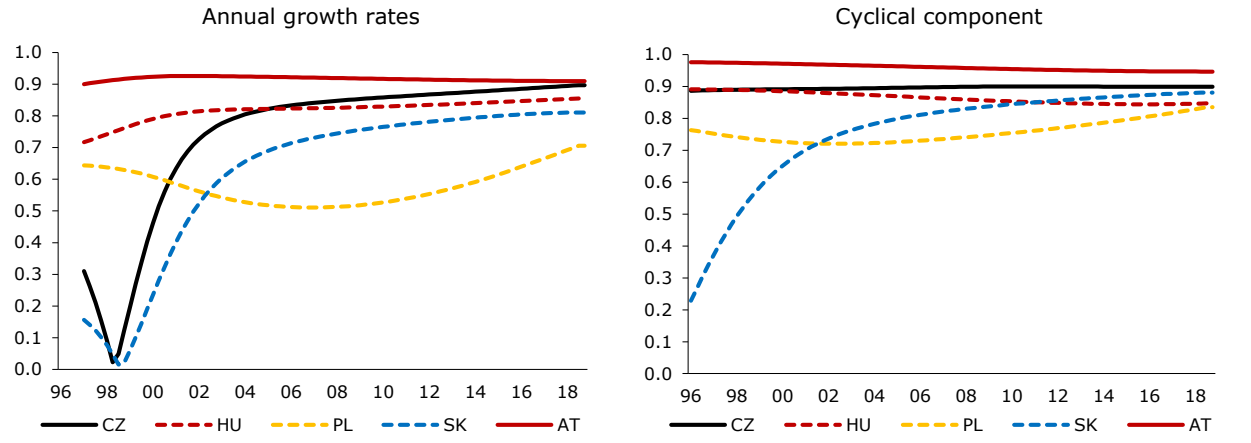
[20] Babecká Kucharčuková and Brůha (2017) showed that countries with lower-quality institutions took more time to recover following the economic and financial crisis, while euro adoption per se did not play a role.
[21] The filter proposed by Christiano and Fitzgerald (2003) is used. The frequency of the cyclical component is defined as fluctuations at frequencies of 6–32 quarters.
[22] Two principal component models with time-varying parameters were used for this section. The model of Su and Wang (2017) was selected as the main method. The results were verified using the method of Brůha and Babecká Kucharčuková (2019), which is robust to outliers. The results of the two methods are identical in qualitative terms. One advantage of both models is that the time variability of the parameters is determined using data; a time-invariant model can be obtained as a special case. Another advantage of both methods is that – unlike for approaches based on the sample distribution or rolling windows – one can avoid ad-hoc selection of the parameter, i.e. the duration of the window or the moment of the sample distribution.
[23] See Babecká Kucharčuková and Brůha (2018).
[24] All the results described in this section apply both to annual GDP growth and to the analysis based on the cyclical components of GDP.

poorly aligned even before 2008. After the crisis, the synchronisation of economic activity with the rest of the EU also dipped temporarily in some other countries of the southern periphery (Portugal and Spain), but it has increased again in the last two years. The synchronisation of the UK economy with the rest of the EU has declined in recent years.

The synchronisation of economic activity in converging Central European countries rose significantly after they joined the EU. At the start of the period under review, economic activity in these countries was little synchronised with the euro area core countries and their economic growth was dominated by different factors, for example in the Czech Republic by the fading effects of the 1997 banking and currency crisis. The synchronisation of economic activity increased as trade with other EU countries grew, and it has been high since EU accession. Chart 1 shows the time-varying correlation of annual growth rates in the Visegrad countries (V4) with the first principal component.

The analysis shows that alignment of economic activity does not represent a barrier to euro adoption for the Czech Republic. The Czech Republic's economic activity is well synchronised with the euro area countries, especially Germany, France, Austria and Slovakia.[25]

Chart 1: Time-varying correlation of GDP growth with the first principal component
(V4 countries and Austria)



Source: Eurostat, CNB calculations.

Source: Eurostat, CNB calculations.

[25] The recently slightly different dynamics of real GDP in the Czech Republic compared with Germany, for example, are fully within the bounds of idiosyncratic volatility in both time and space.

3 CONVERGENCE OF REGIONS IN SELECTED EU COUNTRIES

Jan Babecký, Luboš Komárek

An assessment of the economic performance of selected EU countries at the regional level reveals that while the regional disparities in traditional EU Member States (Austria, Germany and Portugal) are decreasing, those in countries that acceded later (the Czech Republic, Hungary and Slovakia) are widening. This applies in particular to the disparities between these countries' capital cities and other regions.

Supporting regional growth and reducing disparities in wealth between EU regions are key economic policy areas in Europe. A substantial part of the EU budget is devoted to regional policy, primarily through support disbursed from structural and cohesion funds. GDP per capita at purchasing power parity at the NUTS 2[26] regional level is used as the measure of wealth. The reference value for regional policy is the EU average. NUTS 2 regions with GDP per capita below 75% of the average are given priority in the drawdown of EU structural funds.[27]

Monitoring the wealth of individual regions allows the standard assessment of convergence of the countries under review to be expanded to provide a more detailed view. The evolution of GDP per capita at purchasing power parity[28] for NUTS 2 regions in selected EU countries[29] shows that the capital cities of all the countries under review except Germany are substantially wealthier than the other regions (see Chart 1). In the newer EU states, moreover, this disparity has mostly increased in recent years, while in the traditional EU states the opposite is true. All the regions of Austria and Germany exceed 75% of average EU GDP, whereas in the other countries under review, only some regions – primarily the capitals – are above this reference value. Despite the increasing disparities between the capital cities and other regions of the Czech Republic, Hungary and Slovakia, the wealth of most regions in these countries has been rising faster than the EU-28 average.

The concept of beta- and sigma-convergence is used to assess the evolution and degree of real convergence across regions. This concept is based on the neo-classical theory of economic growth.[30] Beta-convergence allows us to assess whether poorer regions are catching up with welfare ones, while sigma-convergence is used to assess the degree of convergence achieved across regions and over time. The time period of 2000–2018 enables us to assess developments both before and after the onset of the global financial and economic crisis and the European debt crisis.

A look at beta-convergence shows that while regions in the traditional EU countries were converging in the period under review, the disparities between regions in the newer member countries were increasing. Chart 2 illustrates the relationship between the initial levels of GDP per capita in the individual regions and the cumulative growth in their GDP per capita in the period under review. It shows that Austria, Germany and Portugal recorded faster growth in regions

[26] NUTS stands for *Nomenclature d'unités territoriales statistiques*, or the Nomenclature of Territorial Units for Statistics. The Czech Republic is divided into eight NUTS 2 cohesion regions: CZ01 Prague, CZ02 Central Bohemia, CZ03 South West, CZ04 North West, CZ05 North East, CZ06 South East, CZ07 Central Moravia and CZ08 Moravia-Silesia.
[27] The reference value for support from cohesion funds is GDP per capita below 90% of the EU average.
[28] The use of GDP at purchasing power parity (PPP) rather than GDP converted into a reference currency (EUR) at the market exchange rate somewhat overestimates the results for post-Communist countries (which generally have a lower price level than the EU average) and conversely underestimates the results for Western European countries. This is due to the mechanism used to calculate purchasing power parity, which takes into account, for example, incomes and expenditures of the population that are de facto not reflected in the market rate, such as the amount of subsidies, the size of the administered price segment, differences in taxation and the amount of social transfers. On the other hand, the PPP-converted exchange rate does not reflect current demand for the currency on the forex market, including, for example, global sentiment.
[29] Unlike in the other parts of this document, the countries covered in this section do not include Poland and Slovenia. In the case of Poland, this is due to changes in the NUTS nomenclature causing sufficiently long time series to be unavailable. For Slovenia, the reason is its small geographical size, as it has only two NUTS 2 regions.
[30] See, for example, Barro and Sala-I-Martin (1992). For an application of beta- and sigma-convergence to regional development, see, for example, Monfort (2008).

with lower initial GDP levels (a negative slope of the fitted trend line), so these poorer regions converged towards the wealthier ones in the period under review. By contrast, the Czech Republic, Hungary and Slovakia recorded beta-divergence despite a marked rise in economic activity per capita, with wealthier regions – the capitals in particular – growing faster than poorer ones on average.[31] Table 1 illustrates the evolution of beta-convergence over time for regions in individual countries and groups of countries. It shows that while Germany recorded beta-convergence between regions even before the crisis, in Portugal and Austria such convergence was not visible until after the crisis.[32] Looking at the regions through the lens of broader territorial units across the countries under review, beta-convergence can be observed for the trio of Austria, Germany and Portugal for both sub-periods and for the overall period. The picture is similar when we analyse the regions of the six countries under review together (EU-6) – the regions are converging over time from this point of view. However, the results are strongly affected by Germany.[33]

The traditional EU countries also achieve better sigma-convergence results. Portugal and Austria attain the highest inter-regional sigma-convergence, and the degree of convergence between Germany's regions is only slightly lower (see Chart 3 – lower values denote a higher degree of convergence). In 2009–2018, some convergence between regions occurred in Hungary and the Czech Republic, but the difference relative to the above-mentioned Western European economies is still sizeable. The regions in the group of six economies under review (EU-6) are gradually converging (see the right-hand part of Chart 3).

Our analysis of the evolution of wealth in the regions of the countries under review thus reveals that larger regional disparities persist in the newer EU countries and that those disparities are tending to widen. Most of these regions recorded faster growth in wealth than the EU-28 average, but the growth of some regions – most notably the capital cities – was stronger. In the traditional EU countries, by contrast, the differences between NUTS 2 regions are smaller and gradually shrinking. The newer EU countries should therefore make better use of joint EU funds to enhance cohesion so that the disparities between their capital cities and other regions do not widen further. The growing divergence between regions may cause the support of poorer regions for further political and economic – and hence also monetary – integration to weaken and may thus create a barrier to the adoption of the single currency.

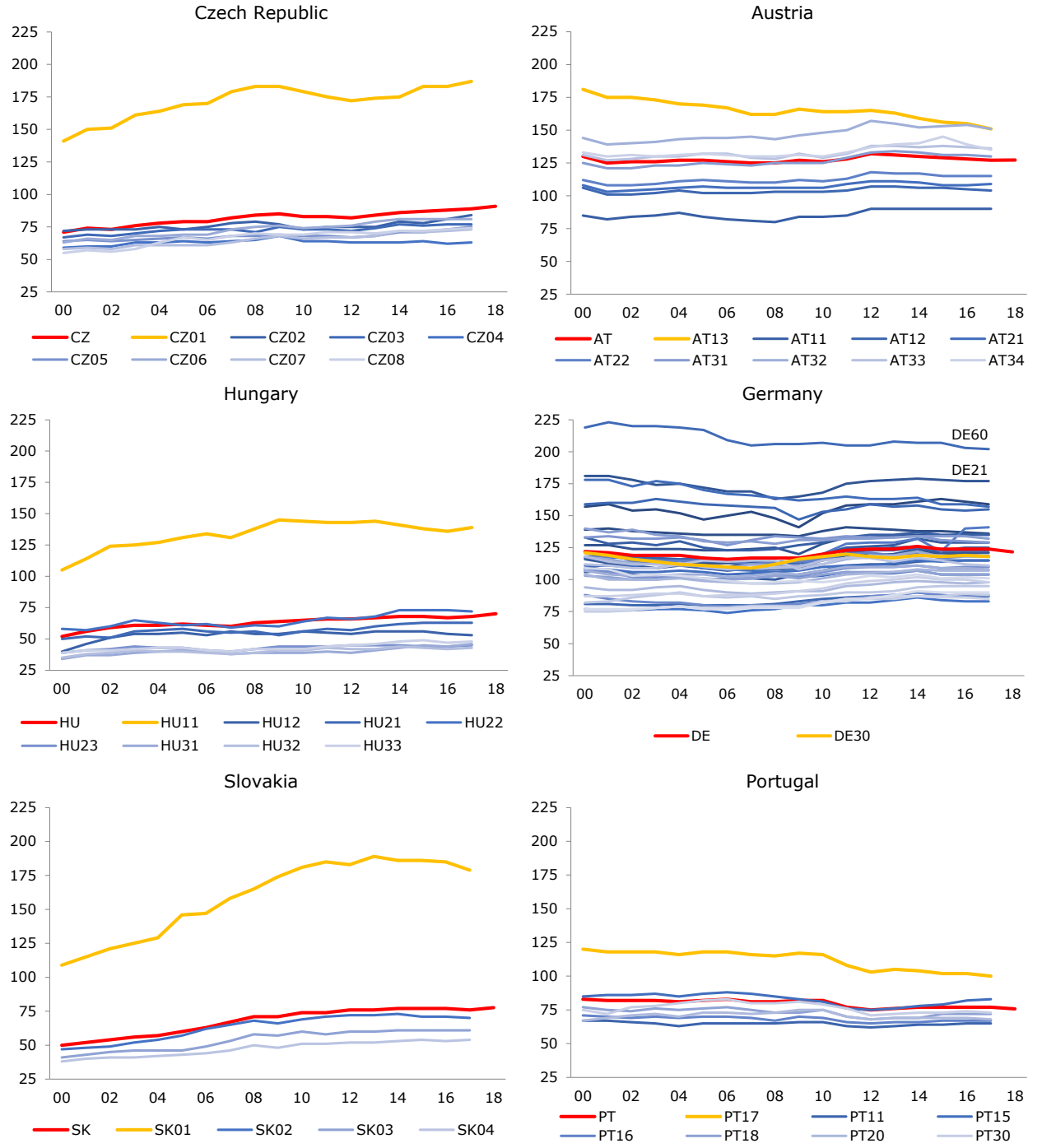
Table 1: Beta-convergence of real GDP per capita at the regional level

	2000–2008	2009–2017	2000–2017	Nobs.
CZ	0.18	-0.03	0.12	8
HU	0.13	-0.12	0.04	8
SK	0.18 *	-0.06	0.28 ***	4
CZ, HU, SK	0.10	0.16	0.05	20
AT	-0.06	-0.16 *	-0.29 *	9
DE	-0.12 ***	-0.10 **	-0.30 ***	38
PT	-0.12	-0.23 ***	-0.38 ***	7
AT, DE, PT	-0.11 ***	-0.16 **	-0.17 ***	54
EU-6	-0.23 ***	-0.27 ***	-0.34 ***	74

Note: The table shows the values of the beta coefficient (slope of the curve) for the given period. Negative, significant values denote convergence. Newer members thus show an absence of beta-convergence in all periods. Nobs is the number of observations (regions). Level of statistical significance: ***(1%), **(5%), *(10%).
Source: Eurostat, CNB calculations.

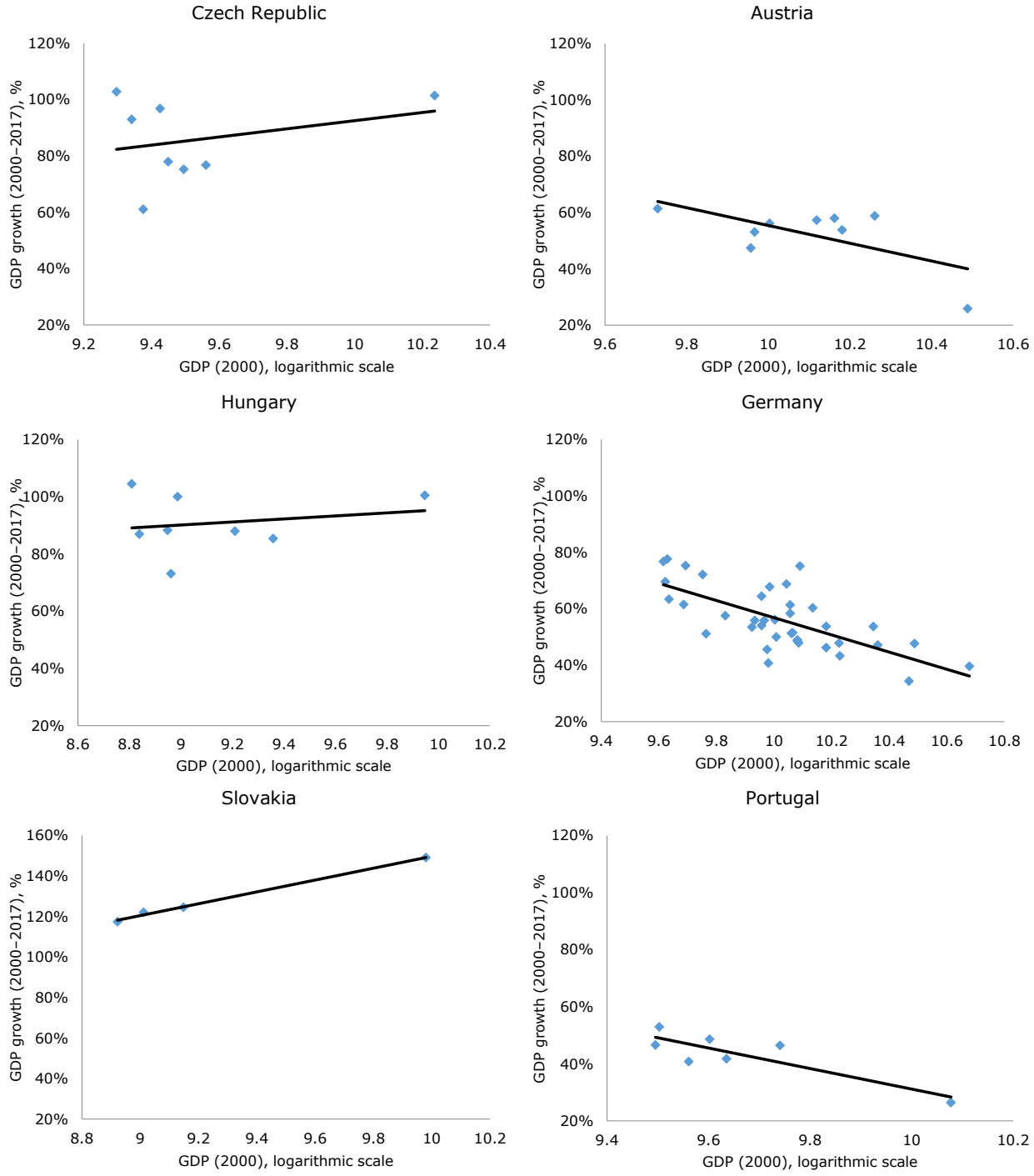
[31] For the Czech Republic and Hungary, the slope of the regression line is largely determined by the capitals, which are much wealthier than the other regions and may have a greater business cycle amplitude. If the capital cities were excluded from the regression for these countries, the slope of the line would be negative, i.e. poorer regions would be converging towards the wealthier ones.
[32] The results follow up on the findings of Alcidi (2019), who identified beta-divergence of regions in Eastern European countries in 2000–2015 but questioned whether the divergence would continue.
[33] Germany has the largest number of regions in the EU-6 (38), whereas Slovakia, for example, consists of only four regions.

Chart 1: Real GDP per capita at purchasing power parity
(EU28 = 100%)



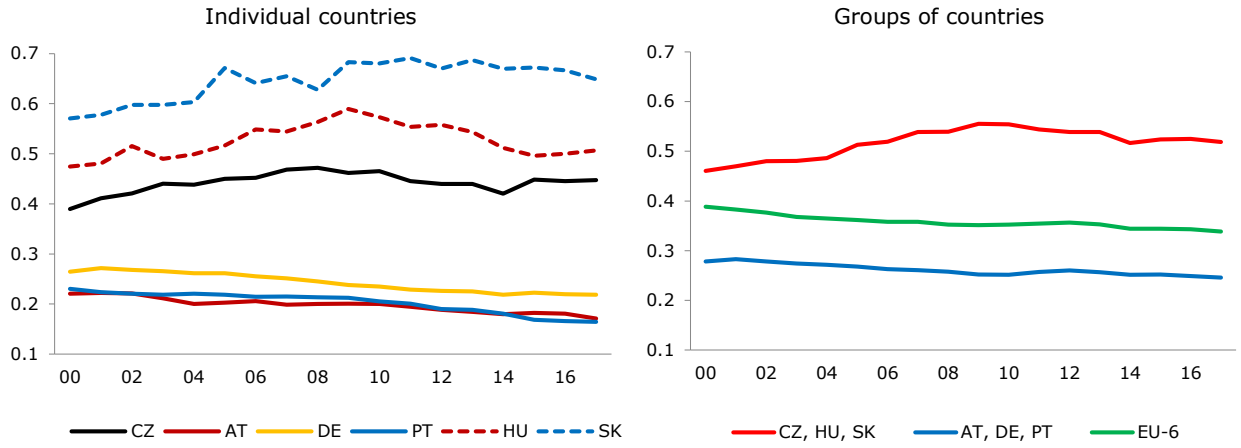
Note: The chart shows the evolution of GDP per capita in selected EU countries at the regional level. The codes correspond to the NUTS 2 region nomenclature (the codes for Germany are omitted due to their large number). The red line denotes the national level (for comparison); the next in the sequence is the capital city (orange line).
Source: Eurostat.

Chart 2: Beta-convergence of real GDP per capita at the regional level
(2000–2017)



Note: The chart shows the relationship between growth in GDP per capita at purchasing power parity for NUTS 2 regions and its initial level.
Source: Eurostat, CNB calculations.

Chart 3: Sigma-convergence of real GDP per capita at the regional level



Note: The chart shows the evolution of the sigma coefficient (the standard deviation of regional GDP per capita at purchasing power parity relative to the average for the given country or group of countries) over time at the level of NUTS 2 regions. Lower values denote a higher degree of convergence.
Source: Eurostat, CNB calculations.

IV CHARTBOOK

The traditional analyses assess the evolution of individual indicators over time and in comparison with selected countries. These countries are either euro area members showing similar features to the Czech Republic in terms of economic level and trade integration, or are countries expected to adopt the euro in the future. The above selection is not related to any assessment of how successfully these economies have performed in the euro area. Germany, the largest trading partner of the Czech Republic, also provides a useful benchmark as a core country of the euro area. However, the large weight of Germany in the calculation of those indicators must be taken into account when making comparisons with aggregate or average economic indicators.

The euro area as a whole is abbreviated as EA in the tables and charts, i.e. unless indicated otherwise in a note, this refers to the EA19:

AT Austria
BE Belgium
CY Cyprus
DE Germany
EE Estonia
EL Greece
ES Spain
FI Finland
FR France
IE Ireland
IT Italy
LT Lithuania
LU Luxembourg
LV Latvia
NL Netherlands
PT Portugal
SI Slovenia
SK Slovakia

The selected non-EA countries under comparison are:

HU Hungary
PL Poland

1 THE CZECH REPUBLIC'S CYCLICAL AND STRUCTURAL ALIGNMENT WITH THE EURO AREA

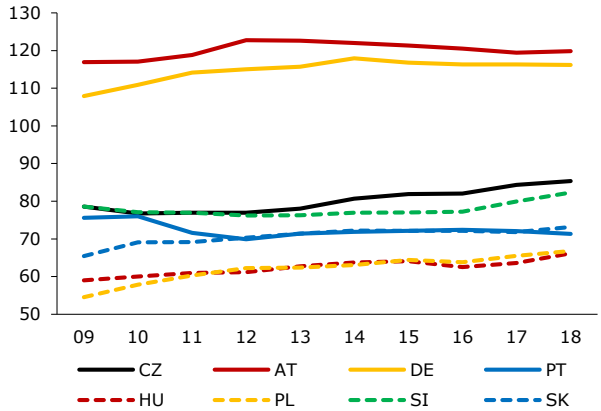
1.1 DIRECT ALIGNMENT INDICATORS

- Real economic convergence[34]
- The Czech Republic's cyclical alignment with the euro area
- Structural similarity of the Czech economy to the euro area economy
- Trade links with the euro area
- Intensity of intra-industry trade with the euro area
- Ownership links with the euro area
- Financial cycle alignment
- Interest rate convergence vis-à-vis the euro area
- Volatility of the Czech currency against the euro
- Alignment of the Czech koruna with the euro
- Financial cycle alignment

REAL ECONOMIC CONVERGENCE

The process of long-term convergence of GDP continues, but the lag behind advanced euro area countries remains significant...

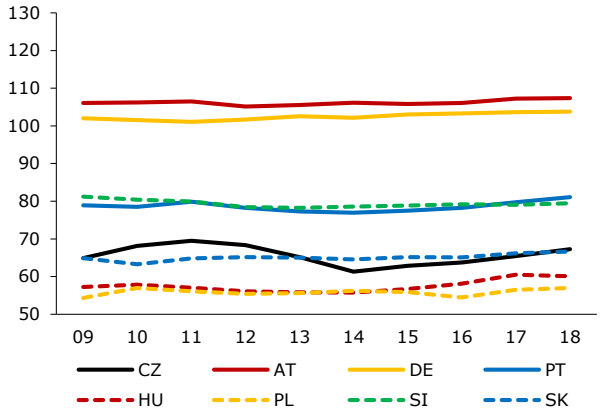
GDP per capita at purchasing power parity (PPP)
(EA = 100)



Source: Eurostat, CNB calculations.

...even more so for the price level, in which the Czech Republic even lags behind Portugal and Slovenia.

Price level of GDP
(EA = 100)



Source: Eurostat, CNB calculations.

[34] The colours and directions of the arrows are explained in the Introduction to this document.

The real exchange rate of the koruna has been appreciating following the exit from the exchange rate commitment. Besides the Czech Republic, the real exchange rate has also strengthened in Austria, Poland and Slovakia compared to 2009.

Real exchange rate against the euro (HICP-deflated)
(2007 = 100; a rise in the index means appreciation of the real exchange rate)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	108.3	112.8	115.3	113.9	110.3	104.1	105.3	106.7	110.5	113.6
AT	100.0	100.0	100.9	100.9	101.7	102.7	103.5	104.3	105.0	105.4
DE	99.4	98.9	98.7	98.3	98.5	98.9	99.0	99.1	99.3	99.4
PT	98.1	97.9	98.7	99.0	98.1	97.5	98.0	98.4	98.4	97.8
HU	95.4	100.1	99.8	99.4	97.2	93.1	92.7	92.5	93.9	92.1
PL	91.4	100.0	98.0	97.7	96.8	96.8	96.1	91.8	94.1	93.5
SI	102.7	103.1	102.4	102.8	103.3	103.3	102.5	102.1	102.1	102.3
SK	113.4	112.4	113.9	115.3	115.4	114.8	114.4	113.5	113.4	114.3

Source: Eurostat, CNB calculations.

Real interest rates in the Czech Republic have been mostly negative over the last ten years, as in most of the other countries under comparison.

Real 3M interest rates
(%, ex post, HICP-deflated)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	1.6	0.1	-0.9	-2.4	-0.9	-0.1	0.0	-0.4	-2.0	-0.7
AT	0.8	-0.9	-2.1	-2.0	-1.9	-1.2	-0.8	-1.2	-2.5	-2.4
DE	1.0	-0.3	-1.1	-1.5	-1.4	-0.6	-0.2	-0.6	-2.0	-2.2
PT	2.1	-0.6	-2.1	-2.1	-0.2	0.4	-0.5	-0.9	-1.9	-1.5
HU	5.0	1.4	2.5	2.3	2.4	2.5	1.5	0.5	-2.2	-2.7
PL	0.4	1.2	0.6	1.2	2.2	2.5	2.5	1.9	0.1	0.5
SI	0.4	-1.2	-0.7	-2.2	-1.7	-0.2	0.7	-0.1	-1.9	-2.2
SK	0.3	0.1	-2.6	-3.1	-1.2	0.3	0.3	0.2	-1.7	-2.8

Source: Eurostat, CNB calculations.

Convergence of Czech wages in euro terms to the euro area average has accelerated over the last two years.

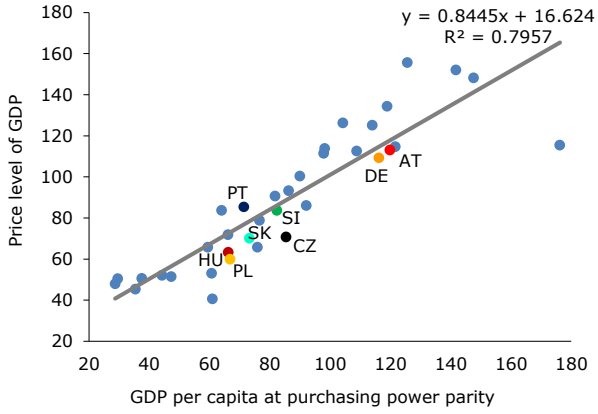
Average wage per employee in EUR
(EA = 100)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	37.2	39.4	40.7	39.8	37.8	36.1	37.0	38.4	41.3	44.7
AT	105.9	104.8	104.7	105.6	106.2	106.7	107.4	108.8	108.6	109.0
DE	93.0	93.3	94.1	94.7	94.9	96.3	97.5	98.6	99.6	100.4
PT	55.5	55.5	53.3	50.7	51.7	50.1	49.7	50.0	50.0	49.9
HU	32.4	32.7	32.6	31.5	30.8	29.4	28.4	29.2	30.8	32.0
PL	26.6	30.7	30.7	30.7	30.7	31.0	31.1	30.9	33.0	34.7
SI	63.0	64.1	63.8	62.0	61.3	61.3	61.3	62.5	63.4	64.5
SK	35.6	36.7	36.7	36.9	37.3	37.5	38.3	38.6	40.0	41.3

Source: AMECO, CNB calculations.

The Czech price level is below the level corresponding to GDP per capita by international comparison. However, the situation is similar in the other Central European countries.

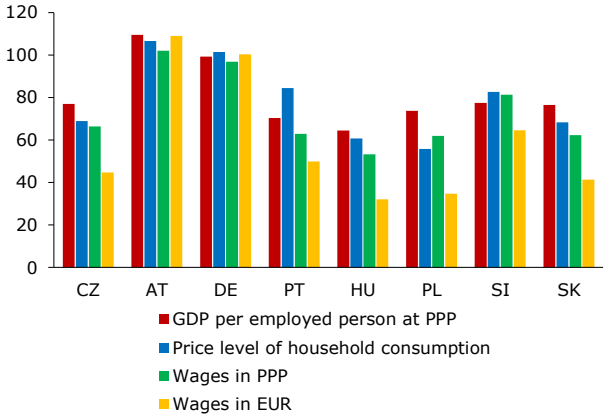
GDP per capita at purchasing power parity versus the price level
(2018, EA = 100)



Source: Eurostat, CNB calculations.

Czech wages at purchasing power parity are roughly 66% of the euro area average. In euro terms, they are only around 45%.

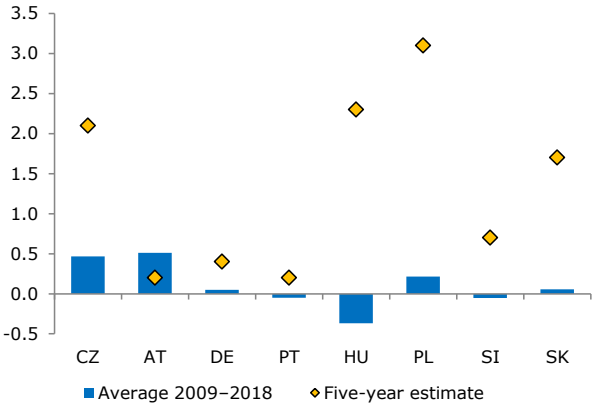
Other indicators of long-term convergence
(2018, EA = 100)



Source: Eurostat, European Commission, CNB calculations.

The real exchange rate of the koruna has appreciated by 0.5% a year on average. Its future annual equilibrium rate of appreciation is estimated close to 2.0%.

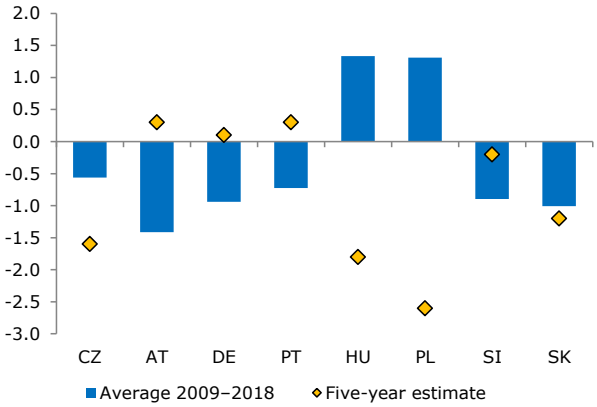
Real exchange rate appreciation: average for last ten years and estimate for next five years
(EA = 100, HICP-deflated)



Note: The chart shows the geometric mean for 2009–2018. The estimate of the average pace of equilibrium real exchange rate appreciation for the next five years is based on a panel regression linking the price level of final consumption of households compared to the euro area average with GDP at purchasing power parity per capita.
Source: Eurostat, CNB calculations.

Czech real interest rates would probably be negative following euro adoption. However, they have been negative on average for the last ten years.

Real 3M interest rates: average for last ten years and estimate for next five years
(%, ex post, HICP-deflated)

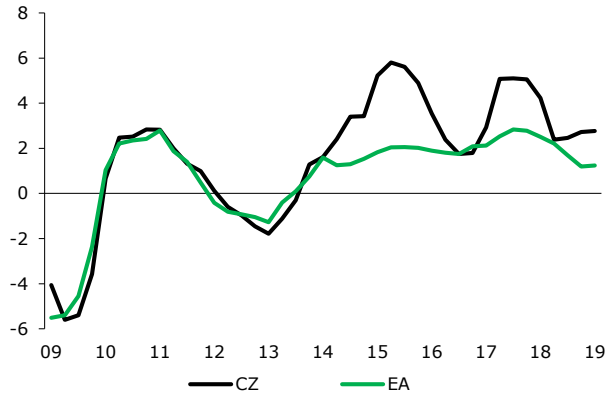


Note: Simple arithmetic mean for 2009–2018. The estimated average equilibrium real average interest rate for the next five years is derived from the estimate of the pace of equilibrium real exchange rate appreciation, assuming a zero money market risk premium and an equilibrium real interest rate in the euro area of 0.5%.
Source: Eurostat, CNB calculations.

CYCLICAL ALIGNMENT OF ECONOMIC ACTIVITY

The growth of the Czech economy has been higher than that in the euro area in recent years.

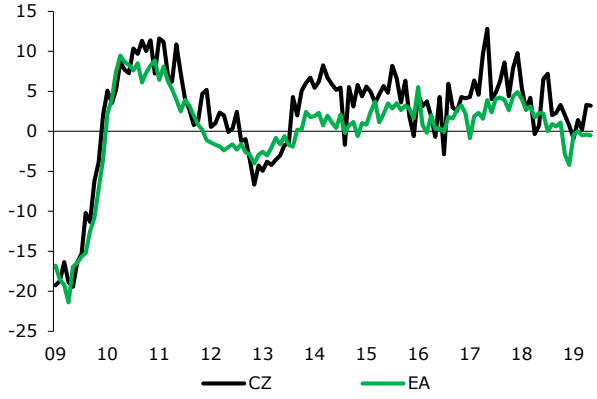
Real GDP
(y-o-y, %)



Source: Eurostat, CNB calculations.

This is due to, among other things, growth in industrial production, which consistently exceeds the euro area average.

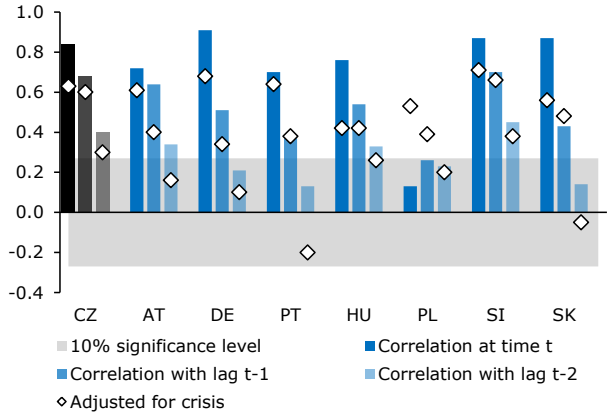
Industrial production index
(y-o-y, %)



Source: Eurostat, CNB calculations.

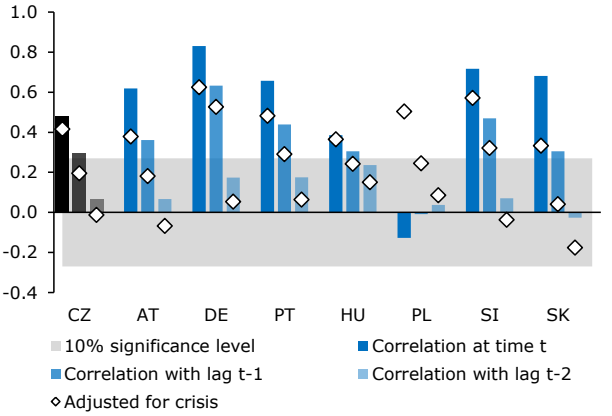
The long-term alignment of the Czech Republic's business cycle with the euro area remains high and is higher than that of the other non-euro area countries under comparison.

Correlation coefficients of GDP with the euro area



However, the correlation between Czech exports to the euro area and euro area GDP is average and showing a significant year-on-year decline.

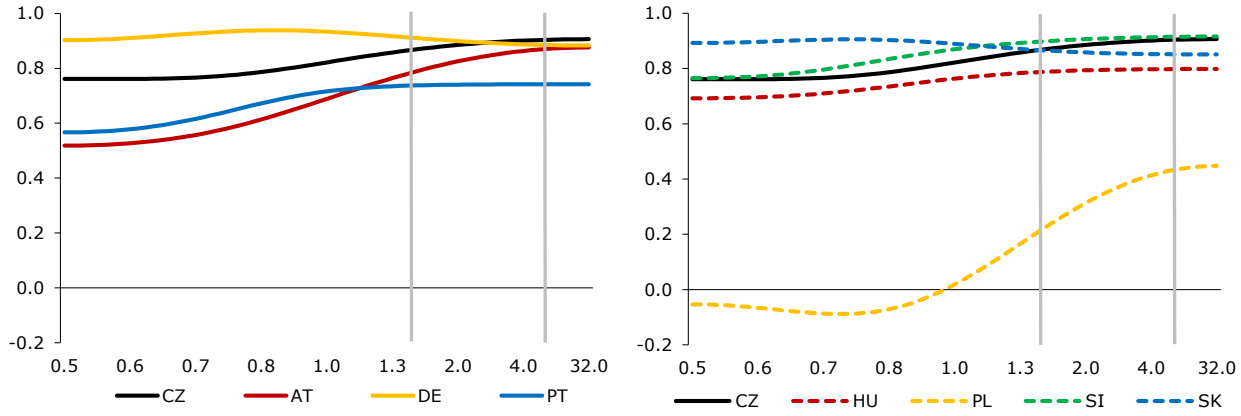
Correlation coefficients of exports to the euro area with euro area GDP



Note: The calculation is based on the quarter-on-quarter differences in the logarithms of the seasonally adjusted data since 2009. For the crisis-adjusted values, the crisis quarter of 2009 Q1 is dropped from the calculation. The statistical significance of the correlation coefficients is indicated in the chart: values statistically significant at the 10% level lie in the white part of the chart (meaning that values in the grey part of the chart are not statistically significant at the 10% level).
Source: Eurostat, CNB calculations.

The high alignment of the Czech economy with the euro area is confirmed by the dynamic correlations between business cycles in the monitored band of 1.5–8 years.

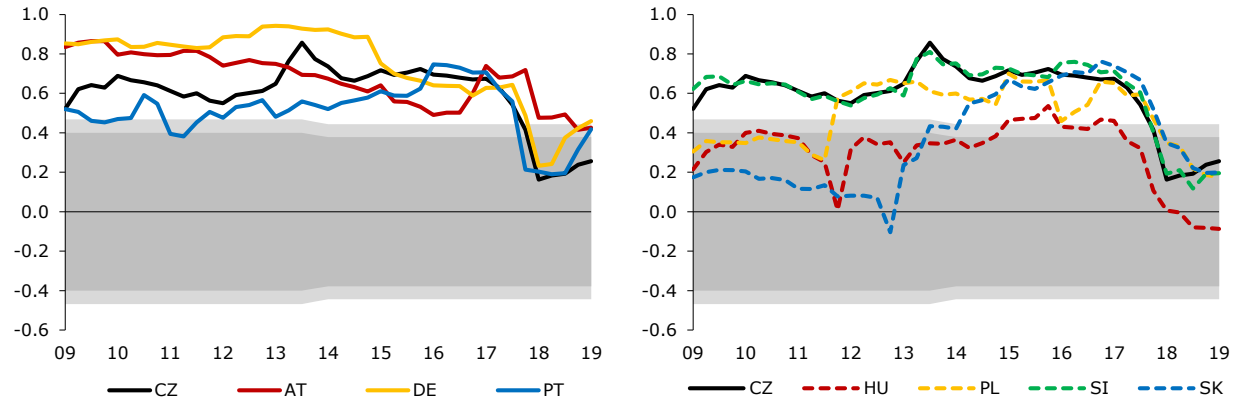
Frequency-specific correlations of economic activity with the euro area



Note: The calculation is based on the quarter-on-quarter differences in the logarithms of the seasonally adjusted data since 2009. For the crisis-adjusted values, the crisis quarter of 2009 Q1 is dropped from the calculation.
Source: Eurostat, CNB calculations.

However, a drop in the rolling correlations with euro area economic activity may signal a change in this trend.

Rolling correlations of economic activity with the euro area

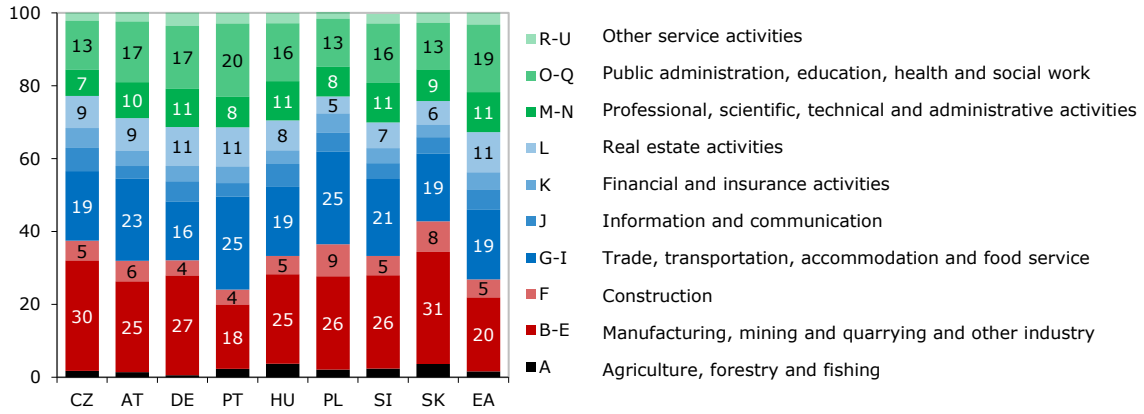


Note: The time data indicate the end of the rolling window of five years (in periods containing the crisis quarter of 2009 Q1, this quarter is dropped from the calculation, i.e. the periods are 4.75 years long). The calculation is based on the quarter-on-quarter differences in the logarithms of the seasonally adjusted data. The statistical significance of the correlation coefficients is indicated in the chart: values statistically significant at the 5% level lie in the white area of the chart, and values statistically significant at the 10% level lie in the white or light grey parts of the chart. Values in the dark grey part of the chart are not statistically significant at the 10% level.
Source: Eurostat, CNB calculations.

STRUCTURAL SIMILARITY OF THE ECONOMIES

The Czech Republic continues to have an above-average share of industry in GDP compared to the euro area.

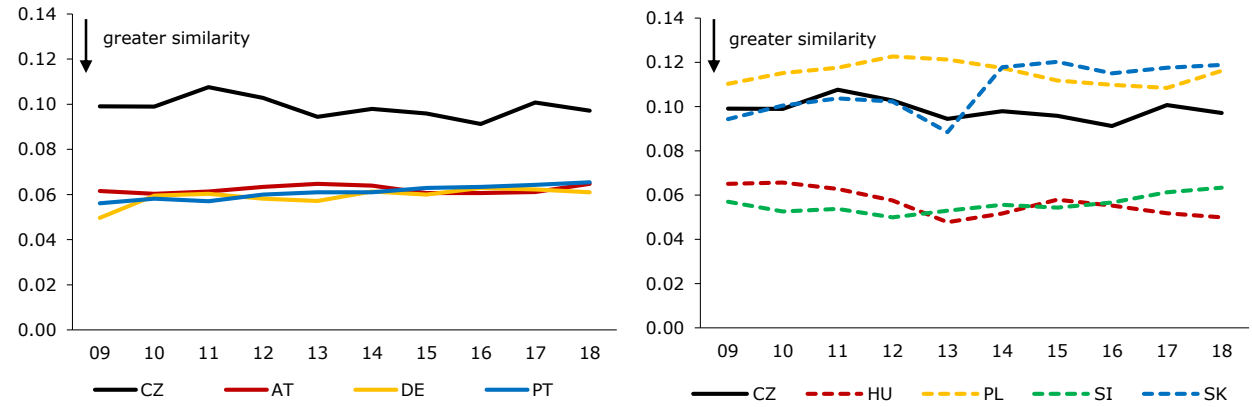
Shares of economic sectors in value added
(2018, %)



Source: Eurostat, CNB calculations.

The different sector structure of value added is also reflected in higher values of the Landesmann index, indicating a lower degree of similarity of the Czech economy with advanced economies.

Structural similarity vis-à-vis the euro area
(Landesmann index)



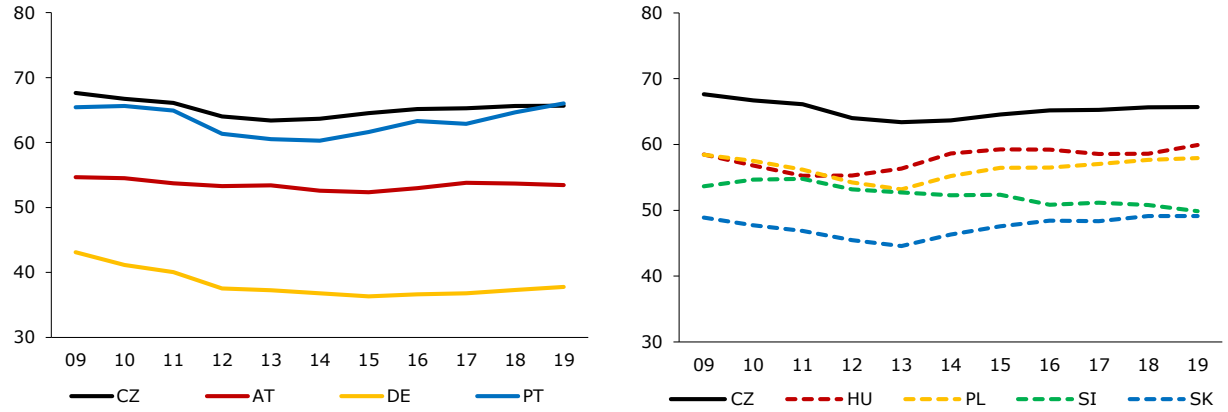
Note: The Landesmann index takes values in the range [0, 1]. The closer the index is to zero, the more similar is the structure of the economies under comparison. Given the methodological changes in the GDP calculation and the revisions of the historical GDP data, the results published in previous issues of this publication may differ slightly from this year's figures.
Source: Eurostat, CNB calculations.

INTEGRATION OF THE ECONOMY WITH THE EURO AREA

The share of exports to the euro area in total exports has long been high in the Czech Republic...

...above the levels seen in the other new EU Member States under comparison.

Shares of exports to the euro area in total exports
(%)

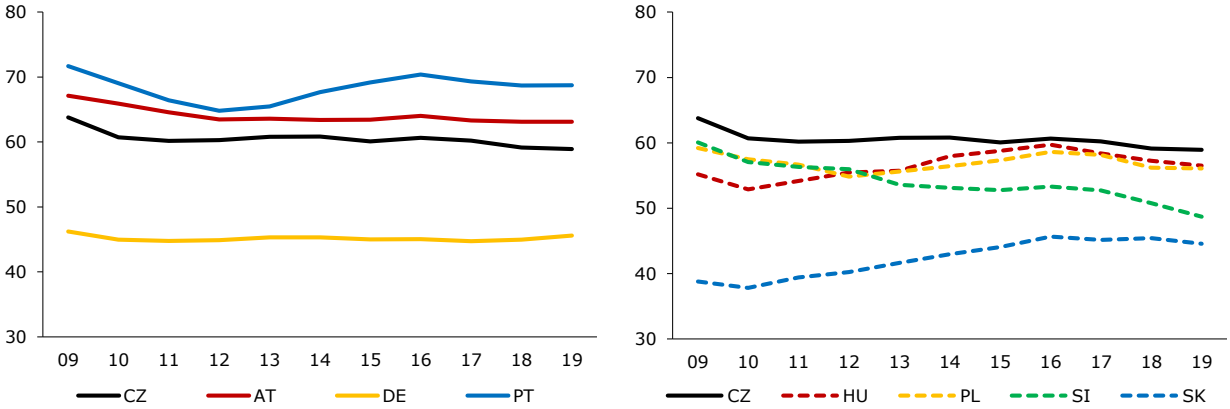


Note: The 2019 figure is for the first five months of the year.
Source: Eurostat, CNB calculations.

The share of imports from the euro area to the Czech Republic is slightly lower...

...but is the highest among the new EU Member States.

Shares of imports from the euro area in total imports
(%)

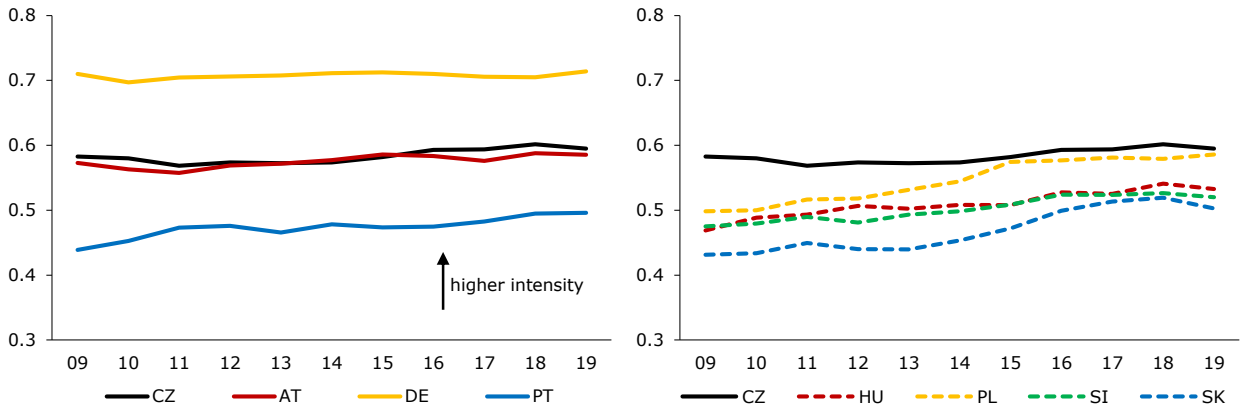


Note: The 2019 figure is for the first five months of the year.
Source: Eurostat, CNB calculations.

The structural similarity of the Czech economy with the euro area is also evidenced by a high mutual intensity of intra-industry trade...

...which is again the highest among the new EU Member States. Only Poland has achieved similarly high levels in recent years.

Intensity of intra-industry trade with the euro area
(under SITC5)



Note: The results were calculated using the five-digit SITC classification. To analyse intra-industry trade we used the Grubel-Lloyd index, which indicates the share of the absolute amount of intra-industry trade in total foreign trade turnover with the euro area. The 2019 figure is for the first five months of the year.
Source: Eurostat, CNB calculations.

Alignment of economic activity is also fostered by a high level of ownership links. The Czech Republic has the highest ratio of investment from the euro area to GDP among the countries under comparison.

Ratios of FDI stock from the euro area to GDP
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	54.9	57.9	53.8	60.6	59.3	61.7	62.4	63.5	65.2	62.2
AT	44.7	36.0	35.3	35.6	35.2	36.6	44.5	35.1	35.9	36.4
DE	23.1	23.5	23.6	25.8	27.0	26.3	26.2	26.4	26.6	28.0
PT	36.4	40.8	42.0	55.5	59.1	59.8	58.6	61.2	62.8	58.5
HU	50.0	51.0	49.0	58.4	56.3	56.3	58.1	51.0	47.1	45.1
PL	24.7	36.1	32.7	37.0	39.1	39.5	36.6	39.3	39.5	37.7
SI	18.6	18.8	20.1	20.8	19.8	21.9	23.7	25.6	26.1	26.8
SK	46.4	48.8	48.4	49.8	47.1	44.5	45.4	51.1	52.0	45.6

Source: Eurostat, Hungarian central bank for Hungary, CNB calculations.

Investment by the new EU Member States in the euro area is still relatively low compared to the traditional investor countries. However, the Czech Republic is much better off than the other new EU Member States under comparison.

Ratios of DI stock in the euro area to GDP
(%)

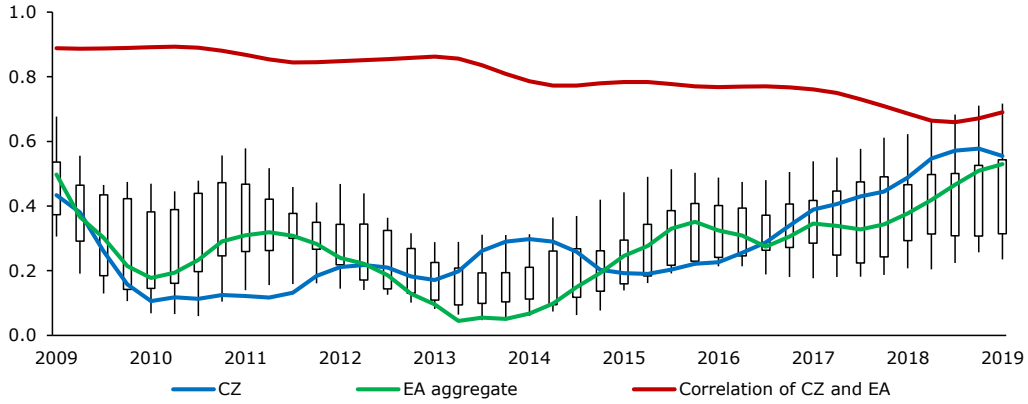
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	11.0	13.1	12.7	14.9	16.7	17.5	18.6	18.1	21.7	20.8
AT	21.9	24.2	25.1	25.0	26.1	30.0	26.1	29.8	31.4	30.0
DE	22.8	23.1	24.1	26.6	27.4	27.7	28.6	29.0	30.3	32.0
PT	17.2	17.4	23.7	28.7	30.2	28.8	30.1	32.9	31.9	29.9
HU	6.8	5.7	6.0	10.5	10.3	11.3	8.8	9.8	8.2	8.5
PL	3.0	7.5	7.9	8.8	8.6	8.5	8.8	8.6	7.3	6.9
SI	4.6	4.8	4.7	4.0	3.8	4.2	4.3	4.7	5.3	5.5
SK	5.2	6.2	6.0	8.1	7.1	6.7	7.9	11.4	14.2	8.7

Source: Eurostat, Hungarian central bank for Hungary, CNB calculations.

ALIGNMENT OF FINANCIAL CYCLES

The euro area economy moved upwards in the expansionary phase of the financial cycle in 2018 and gradually converged towards the position of the Czech economy, whose shift in the financial cycle conversely halted in the past year. The heterogeneity across the euro area countries increased further.

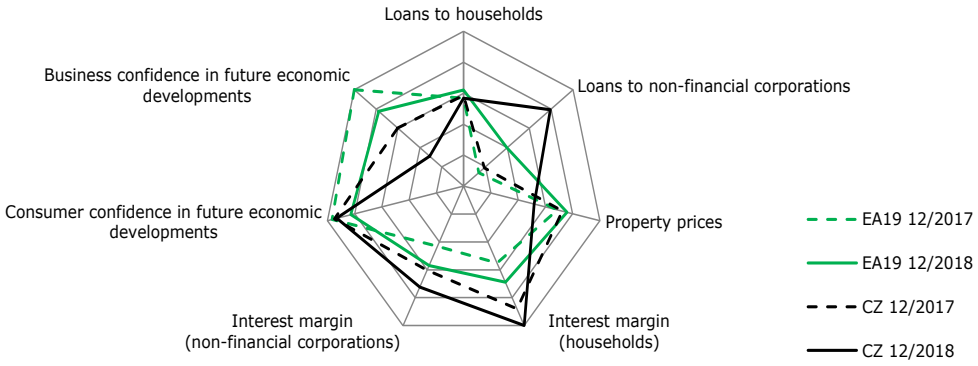
Simplified financial cycle indicators for the Czech Republic and the euro area and their correlation
(0 minimum, 1 maximum)



Note: The financial cycle indicator takes values from 0 to 1 (the trough and the peak of the cycle respectively) The boxplot shows the minimum value, the 25% quantile (the start of the rectangle), the 75% quantile (the end of the rectangle) and the maximum value of the indicator in the euro area countries for each period.
Source: ECB, Eurostat, BIS, national central banks, CNB calculations.

The positions of the Czech Republic and the euro area in the financial cycle were affected by different components of the financial cycle indicator. Significant differences were observed for business confidence, loans to non-financial corporations, interest rate margins for loans to households and property prices.

Components of the simplified financial cycle indicator

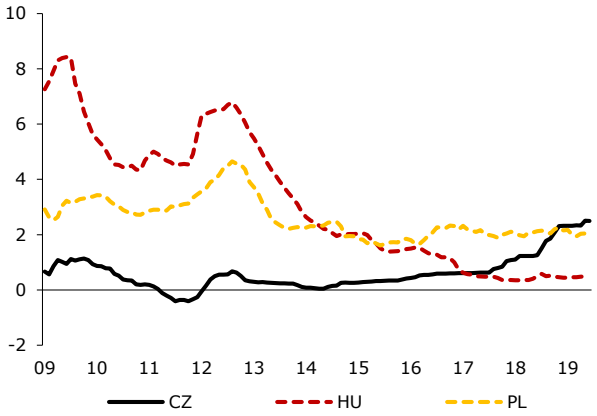


Note: The simplified financial cycle indicator takes values from 0 to 1 (the trough and the peak of the cycle respectively). The same applies to its individual components.
Source: ECB, Eurostat, BIS, national central banks, CNB calculations.

INTEREST RATE CONVERGENCE

The monetary policy tightening by the CNB and, conversely, the expected monetary policy easing by the ECB have increased the interest rate differential between 3M rates in the Czech Republic and the euro area.

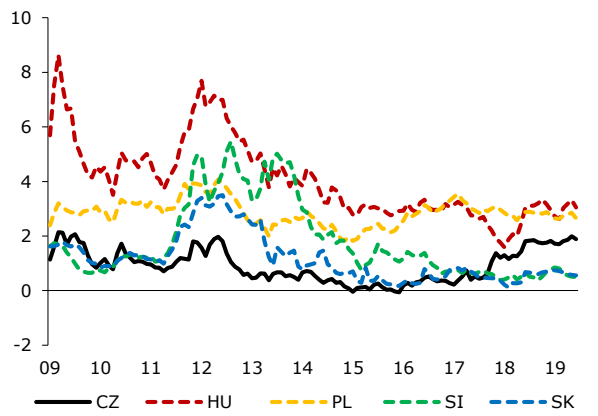
Differences in 3M interest rates vis-à-vis the euro area
(pp)



Source: Eurostat, CNB calculations.

The long-term rate spread has stabilised at 1.8 pp after the interest rate increases by the CNB. The Hungarian and Polish yield spreads are close to 3 pp.

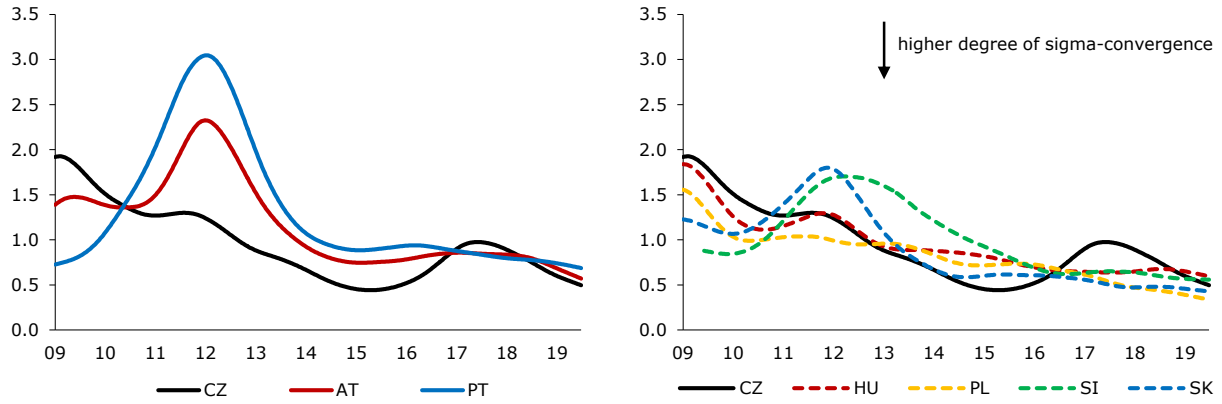
Differences in 10Y interest rates vis-à-vis Germany
(differential in pp vis-à-vis 10Y government bond yield)



Source: Eurostat, CNB calculations.

The alignment of the Czech government bond yield market with the benchmark German market has increased.

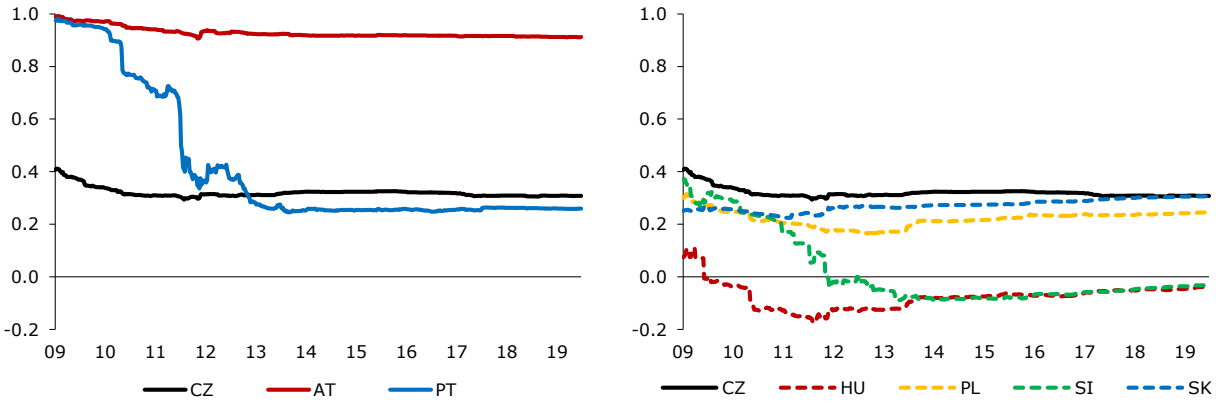
Degree of convergence of government bonds compared to Germany
(sigma-convergence)



Note: Lower standard deviations (y-axis) correspond to a higher degree of convergence.
Source: Datastream, CNB calculations.

The rate of transmission of global news on the government bond market remains relatively high in the Czech Republic.

Sensitivity of asset prices to global news by comparison with the euro area
(gamma-convergence)

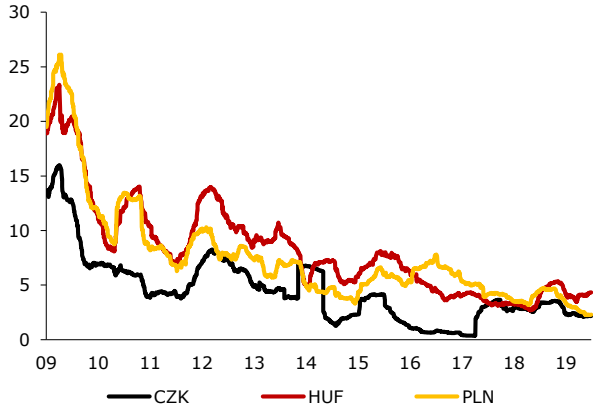


Note: Positive (negative) gamma values close to one express the same (opposite) directional and similarly strong sensitivity to news and hence a higher degree of integration; values close to zero express low integration.
Source: Bloomberg, Datastream, CNB calculations.

EXCHANGE RATE VOLATILITY AND ALIGNMENT

Since the exit from the exchange rate commitment, the historical volatility of the koruna has been stable and only slightly lower than the volatility of the other currencies in the region.

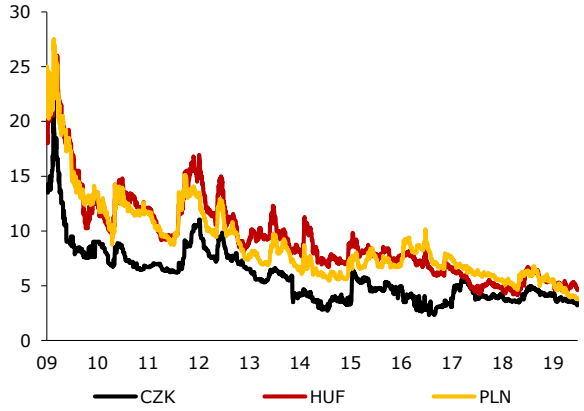
Historical volatility of exchange rates vis-à-vis the euro
(%)



Source: Datastream, CNB calculations.

The implied volatility of the Czech koruna remains the lowest among the currencies of the Central European region.

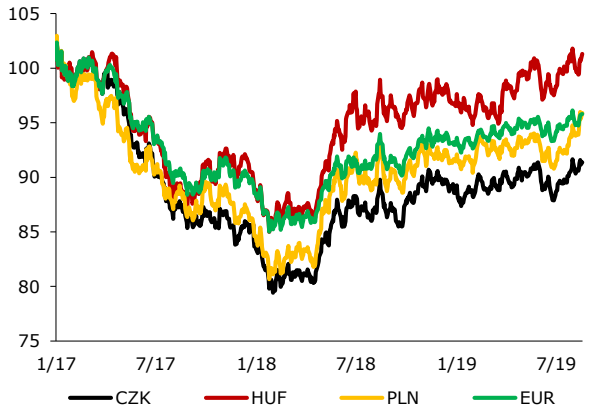
Implied volatility of exchange rates vis-à-vis the euro
(daily data, expected volatilities of exchange rates of national currencies based on prices of options for those currencies, %)



Source: Datastream, CNB calculations.

The currencies under review have depreciated slightly against the dollar so far this year. The weakening of the Czech koruna (by about 3%) has been similar to the weakening of the euro against the dollar.

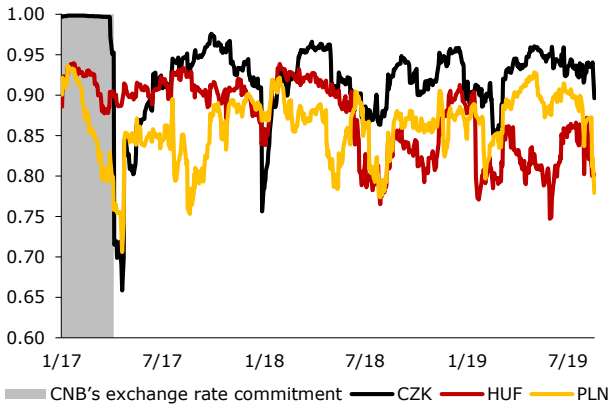
Exchange rates against the US dollar
(index, January 2017 = 100)



Source: Datastream.

The correlation of the koruna-dollar exchange rate with the euro-dollar exchange rate remains the highest among the currencies under comparison. The slight decline in correlation and growth in volatility in recent months reflects developments in the global economy.

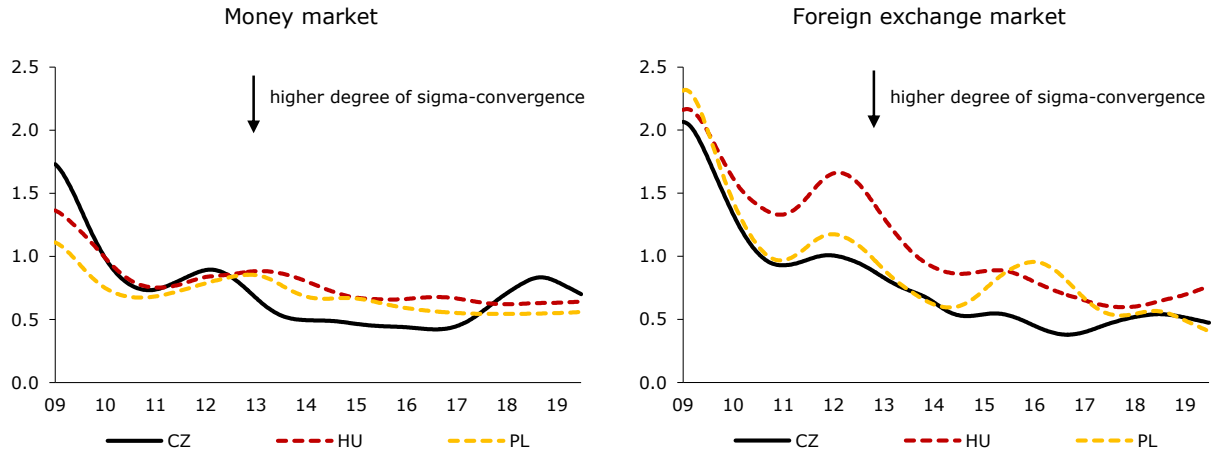
Correlations of exchange rates against the US dollar
(correlations: national currency/USD and EUR/USD)



Source: Datastream, CNB calculations.

The alignment of the Czech money and foreign exchange markets with the benchmark German market is currently rising following a slight decline in the previous two years.

Degree of convergence of national financial markets to the euro area
(sigma-convergence)

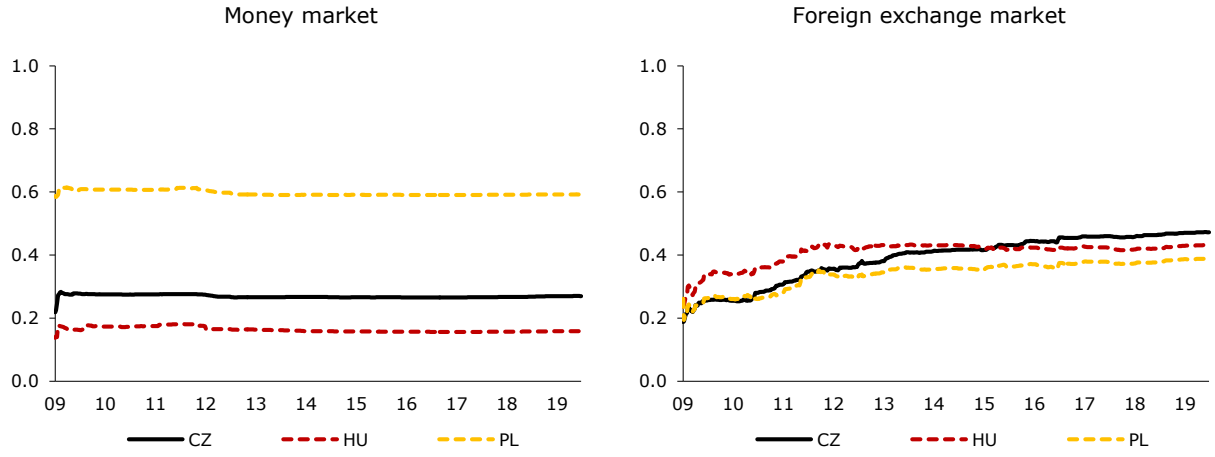


Note: Lower standard deviations (y-axis) correspond to a higher degree of convergence.
Source: Datastream, CNB calculations.

The rate of transmission of global news on the money market remains stable in the Czech Republic…

…while on the foreign exchange market it is rising gradually.

Sensitivity of asset prices to global news by comparison with the euro area
(gamma-convergence)



Note: Positive (negative) gamma values close to one express the same (opposite) directional and similarly strong sensitivity to news and hence a higher degree of integration; values close to zero express low integration.
Source: Bloomberg, Datastream, CNB calculations.

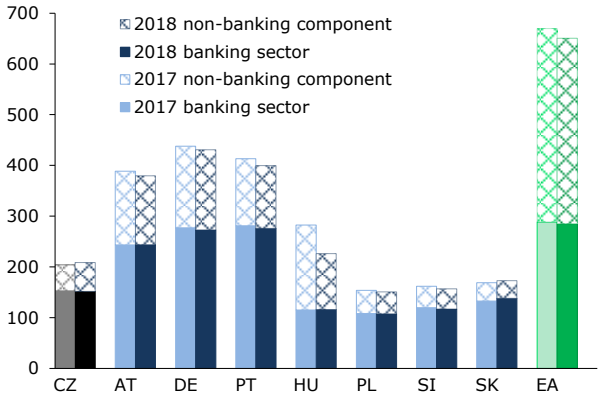
1.2 SIMILARITY OF MONETARY POLICY TRANSMISSION

- Depth of financial intermediation
- Private sector debt
- Structural similarity of non-financial corporations' balance sheets in the Czech Republic and the euro area
- Structural similarity of households' balance sheets in the Czech Republic and the euro area
- Structural similarity between the volume of loans of non-financial corporations in the Czech Republic and the euro area
- Structural similarity between the volume of loans for house purchase in the Czech Republic and the euro area
- Spontaneous euroisation
- Inflation persistence

FINANCIAL SYSTEM

The depth of financial intermediation in the Czech Republic continues to be much smaller than that in the euro area.

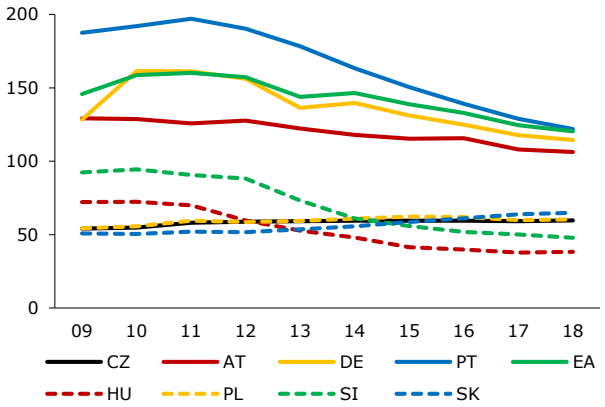
Depth of financial intermediation
(assets of financial institutions as % of GDP)



Note: The financial sector excludes central bank assets. The banking sector's total assets are adjusted for exposures to the central bank. The euro area value exceeds the other countries in the chart due to the large volume of assets of financial corporations in Luxembourg, Ireland, the Netherlands and France both as a percentage of their GDP and in comparison with the total financial assets of the euro area.
Source: CNB, ECB, Eurostat, national central banks.

Private sector debt remains well below the euro area average.

Private sector debt
(% of GDP)

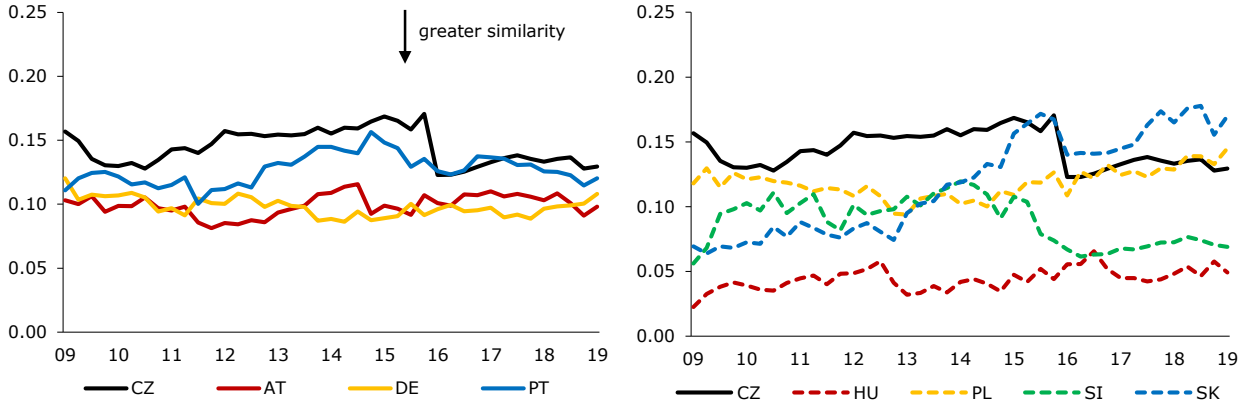


Note: EA represents the average of the euro area member countries weighted by the size of GDP.
Source: IMF, Eurostat.

STRUCTURE OF FINANCIAL ASSETS AND LIABILITIES OF CORPORATIONS AND HOUSEHOLDS

The structural similarity of the balance sheets of Czech corporations with firms in the euro area has increased slightly but remains generally lower.

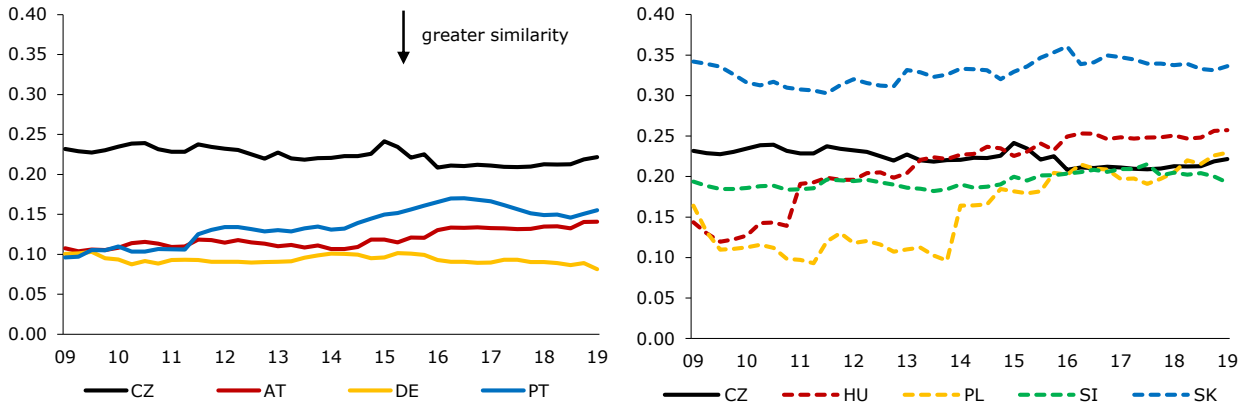
Structural similarity of non-financial corporations' balance sheets from the perspective of financial liabilities
(Landesmann index)



Note: The Landesmann index takes values in the range [0, 1]. The closer the index is to zero, the more similar is the structure of the balance sheets under comparison. The shares of the individual categories of liabilities in total liabilities were used for non-financial corporations.
Source: ECB, CNB calculations.

The structural similarity of the balance sheets of Czech households with households in the euro area has decreased slightly and thus remains relatively low.

Structural similarity of households' balance sheets from the perspective of financial assets
(Landesmann index)

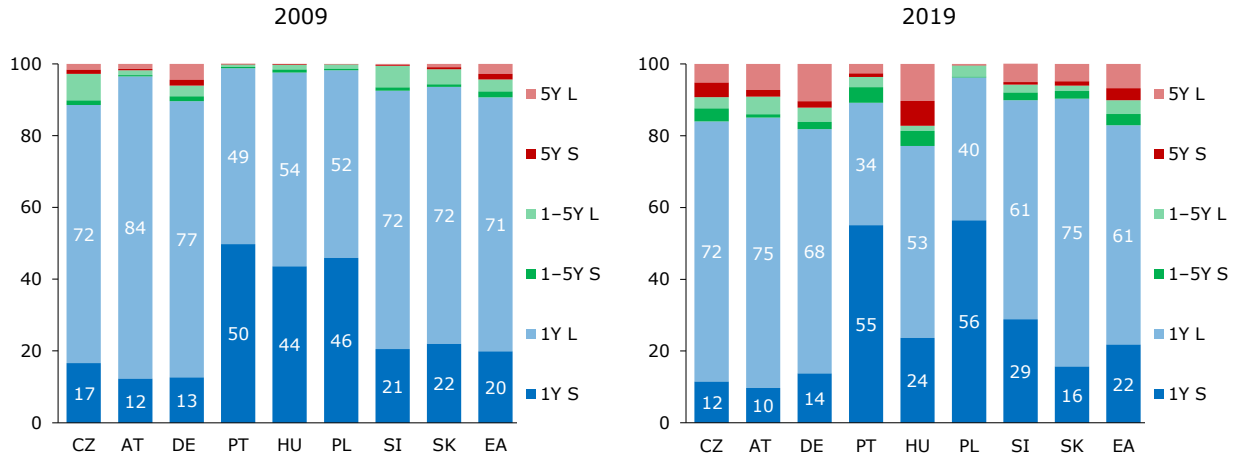


Note: The Landesmann index takes values in the range [0, 1]. The closer the index is to zero, the more similar is the structure of the balance sheets under comparison.
Source: ECB, CNB calculations.

EFFECT OF MONETARY POLICY ON CLIENT INTEREST RATES

Most non-financial corporations in the countries under review take out loans with floating rates or rates fixed for up to one year. This gives rise to relatively fast transmission of changes in monetary policy rates and subsequently market rates to loan rates in this segment.

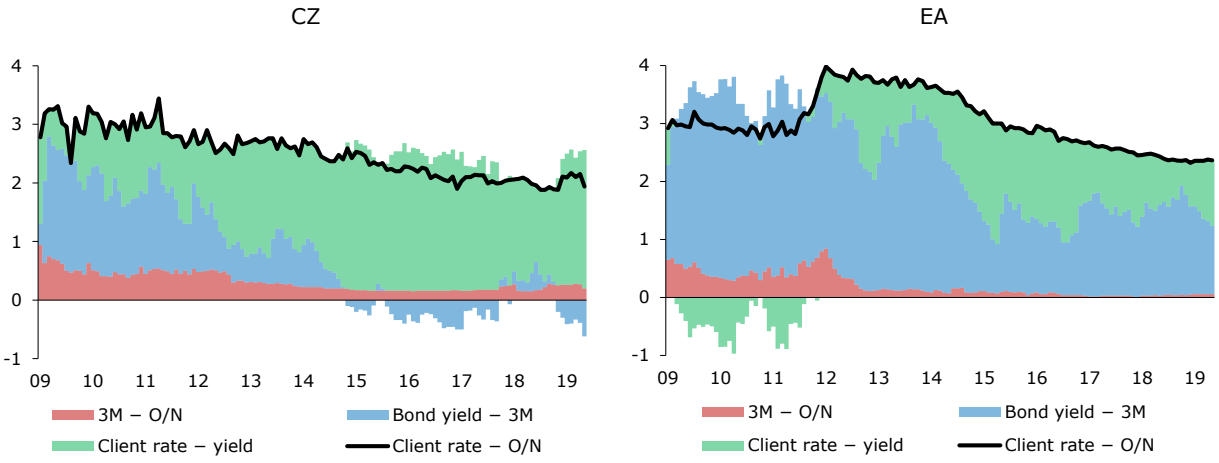
Structure of new loans to non-financial corporations by interest rate fixation period
(%)



Note: 1Y S and 1Y L stand, respectively, for small (up to EUR 1 million) and large (over EUR 1 million) loans with a floating rate or a rate fixed for up to one year, and the other items in the key denote such loans with longer interest rate fixations. The structure of the euro area total varies according to the increasing number of countries. The 2019 data are as of June.
Source: ECB, CNB calculations.

The spread between client rates on loans to non-financial corporations and the overnight interbank rate remains lower in the Czech Republic than in the euro area and has a different structure.

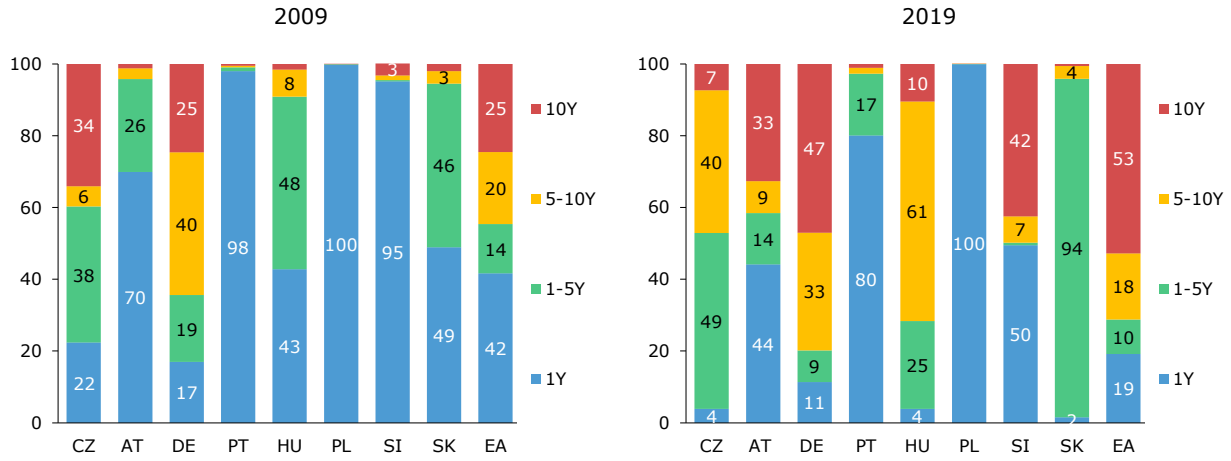
Decomposition of the spread between interest rates on loans to non-financial corporations and O/N interbank rates
(pp)



Note: 3M - O/N is the difference between the three-month rate and the overnight interbank rate. Bond yield - 3M is the difference between the five-year government bond yield and the three-month interbank rate. Client rate - yield is the difference between the client rate on loans to non-financial corporations and the five-year government bond yield. The data are monthly averages.
Source: ECB, CNB, CNB calculations.

Loans for house purchase have shifted towards longer fixation periods in recent years in most of the countries under review.

Structure of new loans to households for house purchase by interest rate fixation period
(%)

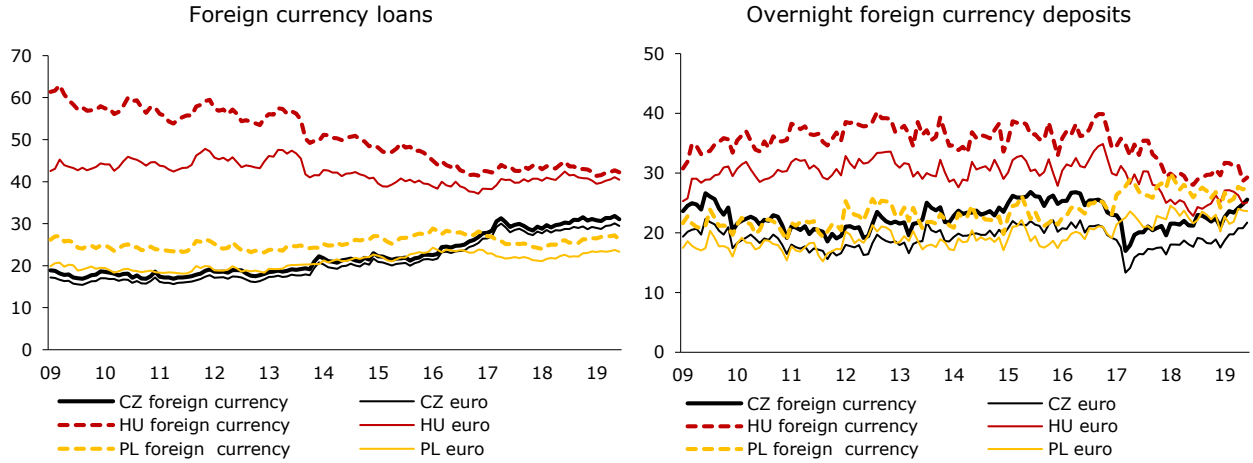


Note: The structure of the euro area total varies according to the increasing number of countries. The 2019 data are as of June.
Source: ECB, CNB calculations.

SPONTANEOUS EUROISATION

The share of foreign currency loans (especially euro-denominated loans) to Czech non-financial corporations is close to a long-term high due to natural hedging against exchange rate risk and a significantly increased interest rate differential.

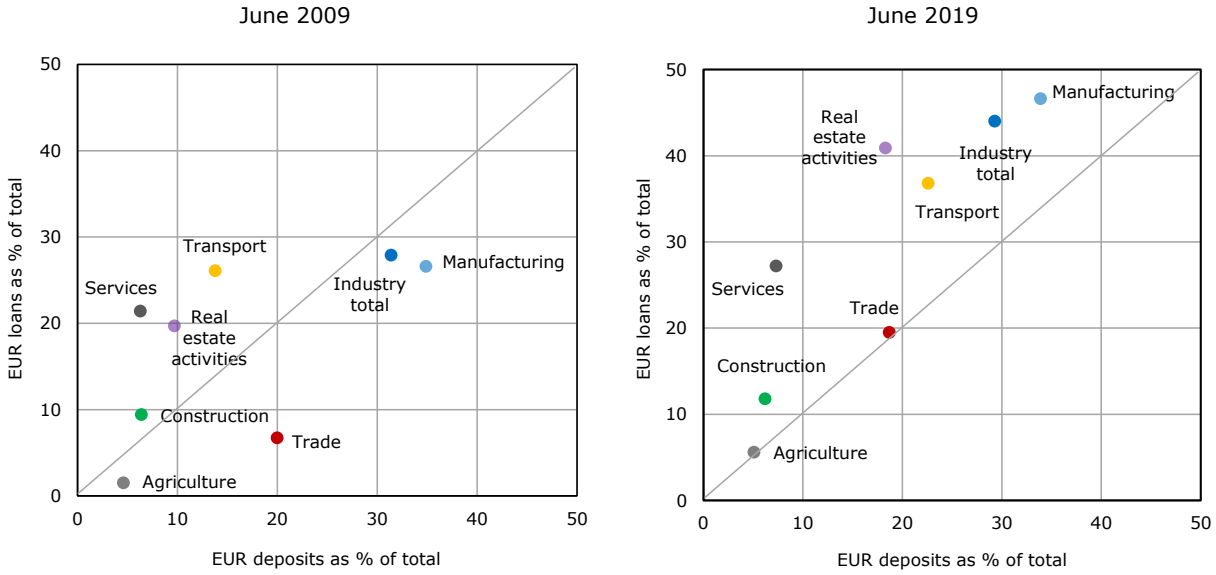
Foreign currency loans and overnight deposits of non-financial corporations
(shares in total loans and overnight deposits of non-financial corporations with domestic banks, %)



Source: ECB, CNB calculations.

The euroisation of the Czech economy is asymmetrical in terms of loans and deposits. The share of euro-denominated loans has long been increasing in most major sectors (to 47% in manufacturing), while the share of euro-denominated deposits has been broadly flat.

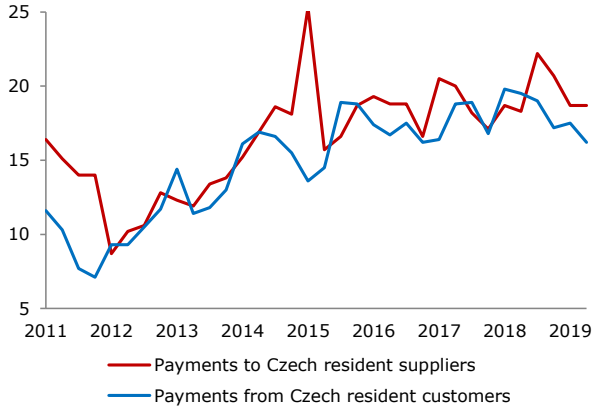
Euro-denominated loans and deposits by sector
(shares in total loans and deposits of non-financial corporations in given sector with domestic banks, %)



Source: CNB.

The share of euro payments between Czech firms has stabilised at increased levels over the last few years due to natural exchange rate hedging.

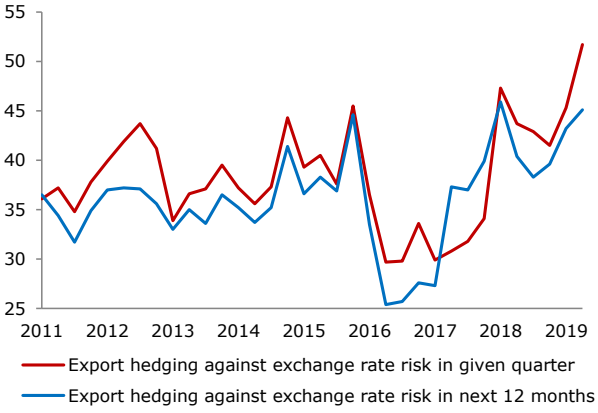
Shares of euro payments between Czech firms
(%)



Source: Survey of non-financial corporations conducted by the CNB and the Confederation of Industry of the Czech Republic.

Hedging of exports via futures operations intensified substantially following the exit from the exchange rate commitment, mainly due to expectations that the koruna would appreciate.

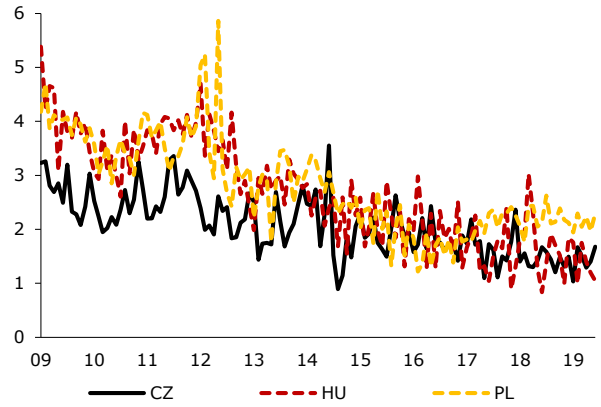
Shares of export hedging against exchange rate risk
(%)



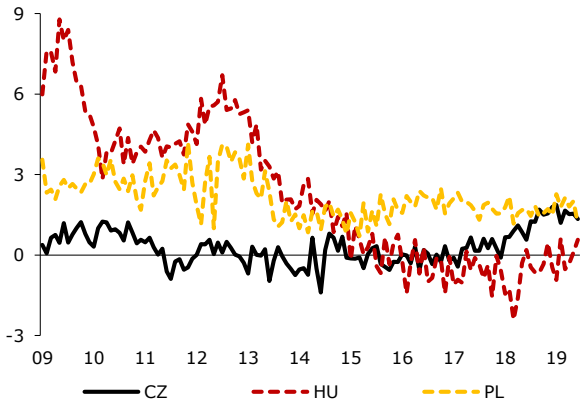
Source: Survey of non-financial corporations conducted by the CNB and the Confederation of Industry of the Czech Republic.

The interest rate differentials on domestic and foreign currency corporate loans in the Czech Republic have risen significantly, providing an incentive for growth in euro-denominated loans recently.

Interest rates on euro-denominated loans of non-financial corporations
(%)



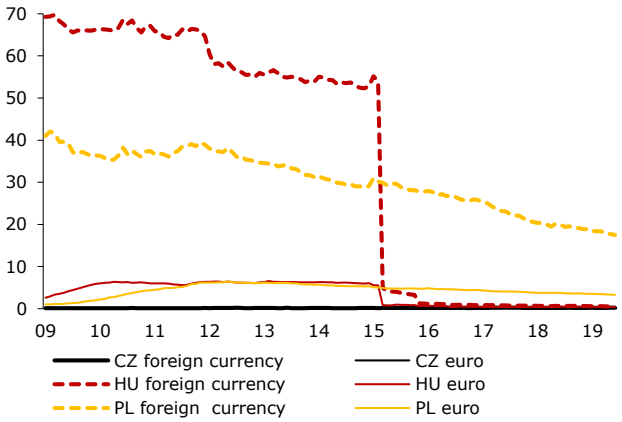
Interest rate differentials on domestic and foreign currency loans of non-financial corporations
(pp)



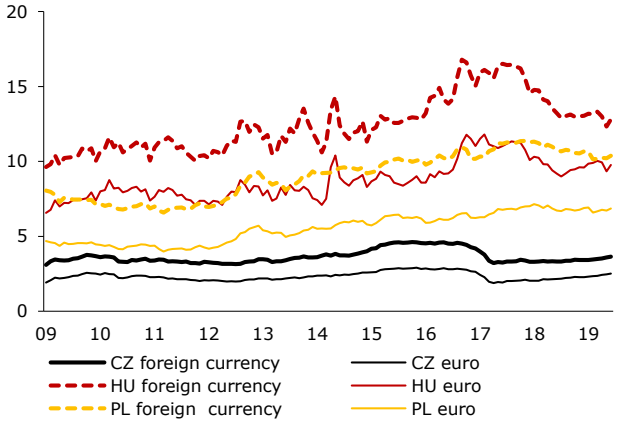
Note: The data refer to large loans of over EUR 1 million with rates fixed for up to one year.
Source: ECB, CNB calculations.

Financial euroisation of households has long been low in the Czech Republic.

Foreign currency loans of households
(shares in total loans to households with domestic banks, %)



Foreign currency overnight deposits of households
(shares in total overnight deposits of households with domestic banks, %)



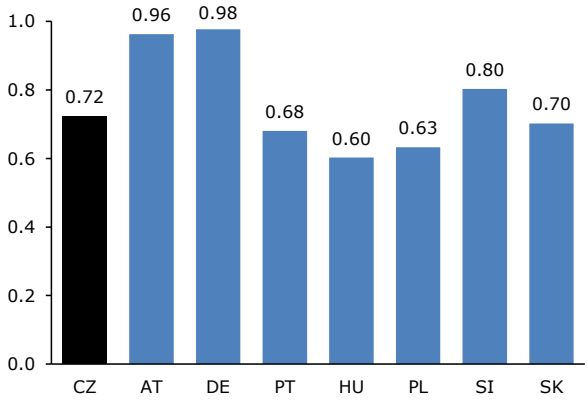
Note: The share of foreign currency loans in Hungary fell to zero in 2015 owing to administrative measures.
Source: ECB, CNB calculations.

Source: ECB, CNB calculations.

INFLATION PERSISTENCE

The Czech Republic is roughly in the middle of the countries under comparison in terms of inflation persistence.

Inflation persistence estimates



Note: Calculation for 2009 Q1–2019 Q2.
The closer the values are to one, the more persistent is inflation.
Source: Eurostat, CNB calculations.

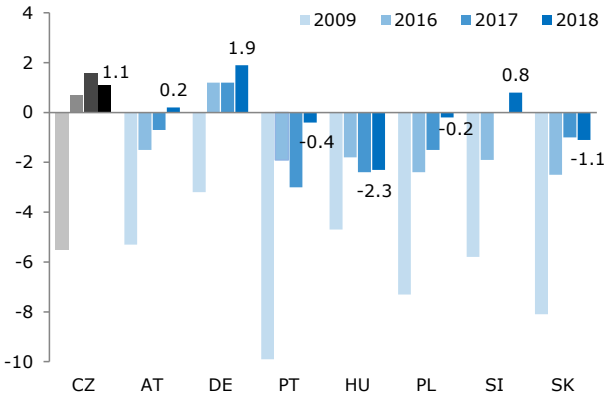
2 ADJUSTMENT MECHANISMS OF THE CZECH ECONOMY

2.1 FISCAL POLICY

- Cyclically adjusted general government balance
- General government debt
- Countercyclical effect of fiscal policy
- Long-term sustainability of public finances

The general government surplus in the Czech Republic decreased last year as a result of expansionary fiscal policy.

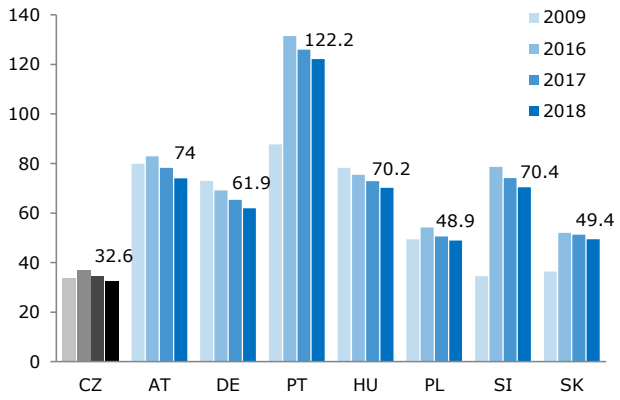
General government balance
(% of GDP)



Source: Eurostat.

Total general government debt is relatively low in the Czech Republic.

General government debt
(% of GDP)



Source: Eurostat.

The Czech Republic ranks among the countries with low sensitivity of the general government balance to economic developments, i.e. with lower automatic stabilisers.

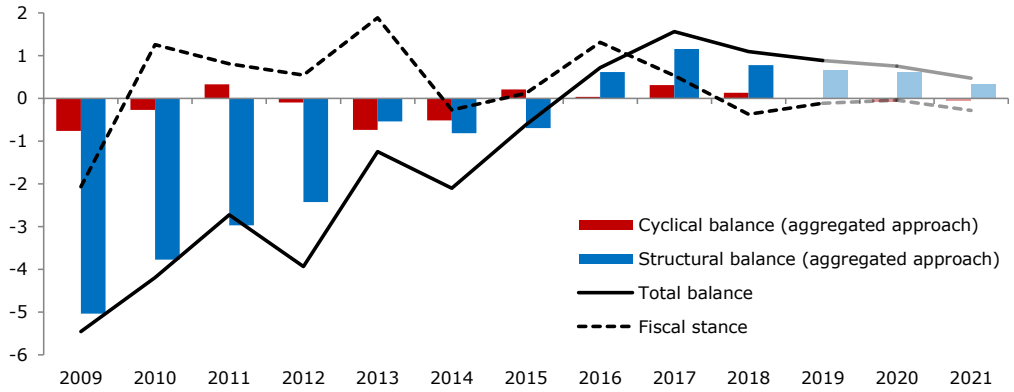
Indicators of the sensitivity of the general government balance to economic developments

	CZ	AT	DE	PT	HU	PL	SI	SK
Total budgetary elasticity	0.45	0.60	0.66	0.54	0.56	0.47	0.45	0.38
Automatic stabilisation of average revenue (in %)	29	45	39	33	34	27	38	31

Note: According to the CNB's internal estimates, total budgetary elasticity in the Czech Republic is even lower, at around 0.34, while the Ministry of Finance estimates it at 0.43. The estimates for the Czech Republic differ due to different estimates of the elasticities of individual tax revenues.
The automatic stabilisation of average revenue indicator expresses the extent (in %) to which a shock to market revenues would be absorbed (or offset) by the tax and social system.
Source: Price et al. (2015), European Commission (2018a).

Czech fiscal policy has often been procyclical.

The Czech Republic's general government balance, its cyclical and structural components, and the fiscal stance
(% of GDP, pp)



Note: The fiscal stance measures the year-on-year change in the structural balance. The structural balance is the general government balance adjusted for the business cycle and one-off measures. The cyclical component is calculated as the product of the output gap and the total budgetary elasticity. It is positive when the output gap is positive.
Source: CZSO (2009–2018), CNB calculations (2019–2021 forecast).

The Czech Republic's overall and cyclically adjusted general government balance is expected to worsen by 2021.

General government balances, European Commission estimates
(% of GDP)

	Total balance						Cyclically-adjusted balance					
	2009	**2017**	**2018**	**2019**	**2020**	**2021**	**2009**	**2017**	**2018**	**2019**	**2020**	**2021**
CZ	-5.5	1.6	1.1	0.2	-0.1	-0.3	-4.6	1.1	0.5	-0.3	-0.4	-0.4
AT	-5.3	-0.7	0.2	0.4	0.2	0.4	-3.8	-0.9	-0.3	0.0	0.0	0.3
DE	-3.2	1.2	1.9	1.2	0.6	0.2	-0.7	0.6	1.3	1.1	0.7	0.5
PT	-9.9	-3.0	-0.4	-0.1	0.0	0.6	-8.7	-3.4	-1.3	-1.0	-0.8	-0.1
HU	-4.7	-2.4	-2.3	-1.8	-1.0	-0.8	-2.2	-3.3	-3.8	-3.5	-2.1	-1.5
PL	-7.3	-1.5	-0.2	-1.0	-0.2	-0.9	-7.8	-1.9	-1.4	-2.2	-1.2	-1.5
SI	-5.8	0.0	0.8	0.5	0.5	0.6	-4.2	-0.7	-0.7	-1.0	-1.0	-0.7
SK	-8.1	-1.0	-1.1	-0.9	-1.2	-1.3	-7.0	-1.1	-1.7	-1.6	-1.8	-1.8
EA	-6.2	-0.9	-0.5	-0.8	-0.9	-1.0	-4.3	-1.1	-0.9	-1.1	-1.1	-1.2
CZ [a)]	*-5.5*	*1.6*	*1.1*	*0.9*	*0.8*	*0.5*	*-4.7*	*1.2*	*1.0*	*0.9*	*0.8*	*0.5*

Note: [a)] Total balance: data according to the CZSO's statistics and notifications (autumn 2019) until 2018, and the CNB's forecast from *Inflation Report IV/2019* for 2019–2021. The cyclically adjusted balance is calculated according to the aggregated approach.
Source: European Commission (2019a, 2019b), CNB.

Together with Slovakia and Poland, the Czech Republic is among the countries with a lower ratio of public expenditures and revenues to GDP compared to the euro area.

Ratios of public revenues and expenditures to GDP in the Czech Republic
(2018, % of GDP)

	CZ	AT	DE	PT	HU	PL	SI	SK	EA
Total revenues	**41.7**	**48.8**	**46.4**	**43.0**	**44.4**	**41.4**	**44.3**	**40.8**	**46.5**
- taxes	20.3	27.3	24.1	25.3	25.1	21.9	21.9	19.2	26.3
- social contributions	15.6	15.2	17.1	11.7	12.3	14.1	15.8	15.0	15.2
Total expenditures	**40.7**	**48.6**	**44.6**	**43.5**	**46.7**	**41.6**	**43.5**	**41.8**	**47.0**
- compensation of employees	9.8	10.4	7.8	10.7	10.5	10.2	11.1	9.3	9.9
- intermediate consumption	6.1	6.2	5.1	5.4	7.5	5.7	6.2	5.5	5.3
- social payments	11.8	17.9	15.6	16.4	11.5	14.9	15.4	13.2	16.6
- gross fixed capital formation	4.2	3.0	2.4	1.9	5.8	4.7	3.6	3.7	2.7
- interest expenditure	0.8	1.6	0.9	3.4	2.4	1.4	2.0	1.3	1.8

Source: Eurostat

A large proportion of state budget expenditures in the Czech Republic are mandatory or quasi-mandatory.

Shares of mandatory and quasi-mandatory expenditures in the state budget
(%)

	2009	2011	2013	2014	2015	2016	2017	2018	2019	2020
Shares of mandatory expenditure in total SB expenditure	53.3	57.2	58.2	57.8	54.2	58.2	57.0	55.0	54.8	54.7
Shares of quasi mandatory expenditure in total SB expenditure	19.6	17.7	17.5	17.3	17.5	18.9	20.2	21.4	21.5	21.8
Shares of mandatory expenditure in total SB revenue	63.8	65.3	62.5	61.7	57.0	55.4	57.3	54.9	56.3	56.1
Shares of quasi mandatory expenditure in total SB revenue	23.5	20.2	18.8	18.5	18.4	18.0	20.3	21.3	22.1	22.3

Note: Actual data for 2009–2018, state budget projections for 2019–2020.
Source: Ministry of Finance of the Czech Republic (2019).

The decrease in general government debt as a percentage of GDP in the Czech Republic is being accompanied by falling debt service costs.

Debt service
(European Commission estimate, % of GDP)

	2009	2013	2014	2015	2016	2017	2018	2019	2020	2021
CZ	1.2	1.3	1.3	1.1	0.9	0.7	0.8	0.7	0.7	0.7
AT	3.1	2.6	2.4	2.3	2.1	1.8	1.6	1.5	1.4	1.2
DE	2.6	1.8	1.6	1.4	1.2	1.1	0.9	0.9	0.8	0.7
PT	3.0	4.8	4.9	4.6	4.1	3.8	3.4	3.1	2.9	2.8
HU	4.5	4.5	4.0	3.5	3.1	2.7	2.4	2.4	2.4	2.4
PL	2.5	2.5	2.0	1.8	1.7	1.6	1.4	1.3	1.2	1.2
SI	1.3	2.5	3.2	3.2	3.0	2.5	2.0	1.6	1.5	1.4
SK	1.5	1.9	1.9	1.8	1.7	1.4	1.3	1.2	1.1	1.1
EA	2.8	2.8	2.6	2.3	2.1	1.9	1.8	1.7	1.5	1.4

Source: European Commission (2019b).

Recent adjustments to the Czech pension system have fostered a further deterioration in the adverse outlook for Czech public finance sustainability.

Age-related government expenditures
(% of GDP)

	Pensions		Health care		Long-term care		Total		Change
	2016	2060	2016	2060	2016	2060	2016	2060	60-16
CZ	8.2	11.6	5.4	6.6	1.3	2.8	14.9	21.0	6.1
AT	13.8	14.7	7.0	8.2	1.9	3.6	22.7	26.5	3.8
DE	10.1	12.5	7.4	8.1	1.3	2.0	18.8	22.6	3.8
PT	13.5	12.0	5.9	8.3	0.5	1.4	19.9	21.7	1.8
HU	9.7	11.1	4.9	5.8	0.7	1.1	15.3	18.0	2.7
PL	11.2	11.1	4.3	5.2	0.5	1.2	16.0	17.5	1.5
SI	10.9	15.2	5.6	6.8	0.9	1.8	17.4	23.8	6.4
SK	8.6	9.9	5.6	7.0	0.9	1.5	15.1	18.4	3.3
EA	12.3	12.4	6.8	7.5	1.6	2.7	20.7	22.6	1.9
CZ [a)]	*7.5*	*10.2*	*4.9*	*6.3*	*1.4*	*2.8*	*13.8*	*19.3*	*5.5*

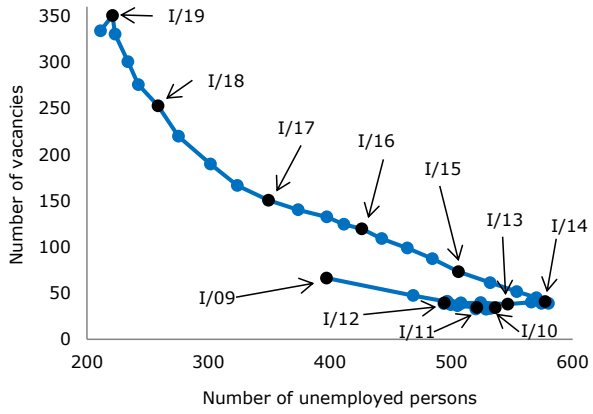
Note: a) CNB calculations, the long-term care projection from the Ministry of Finance of the Czech Republic.
Source: European Commission (2018b).

2.2 THE LABOUR MARKET AND THE PRODUCT MARKET

- Geographical mobility
- Activity rate
- Share of part-time jobs in employment
- Long-term unemployment rate
- Unemployment trap
- Labour market efficiency
- Competitiveness of Czech economy

In recent years, the number of unemployed persons has been falling cyclically and the number of job vacancies has been rising. Their current number is markedly higher than the number of the unemployed.

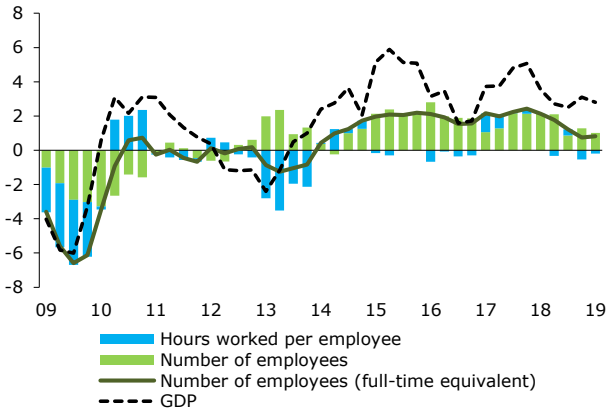
Beveridge curve
(thousands, seasonally adjusted)



Source: Ministry of Labour and Social Affairs.

The number of employees converted into full-time equivalents has been rising steadily since 2014, while average hours worked have been broadly flat.

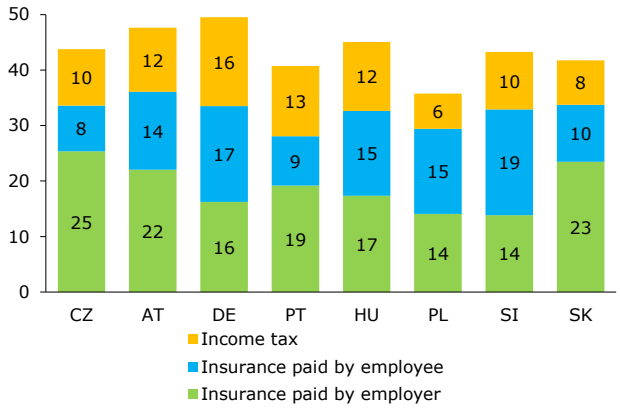
Average hours worked per employee
(annual changes in %, contributions in pp)



Source: CZSO, CNB calculations.

The relatively high labour taxation rate in the Czech Republic is due mainly to high insurance contributions paid by the employer...

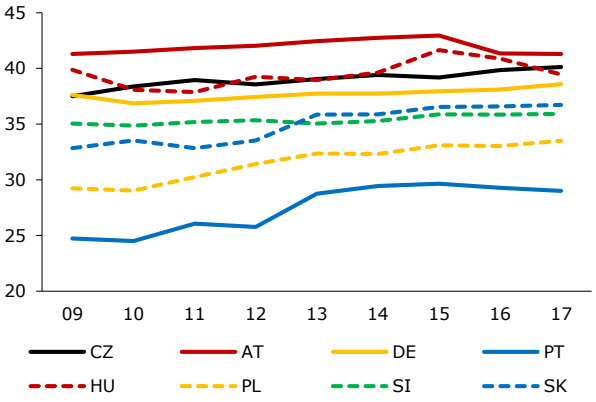
Components of labour taxation
(2018, % of average wage)



Note: Incidental labour costs comprise contributions paid by the employer.
Source: OECD.

...and the overall implicit labour taxation rate in the Czech Republic is one of the highest among the countries under comparison.

Implicit labour taxation rates
(%)



Source: Eurostat.

The long-term unemployment rate in the Czech Republic has fallen steadily in recent years and is the lowest among the countries under review.

Long-term unemployment rate
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	2.0	3.0	2.7	3.0	3.0	2.7	2.4	1.7	1.0	0.7
AT	1.2	1.2	1.2	1.2	1.3	1.5	1.7	1.9	1.8	1.4
DE	3.5	3.3	2.8	2.4	2.3	2.2	2.0	1.7	1.6	1.4
PT	4.2	5.7	6.2	7.7	9.3	8.4	7.2	6.2	4.5	3.1
HU	4.2	5.5	5.2	5.0	4.9	3.7	3.1	2.4	1.7	1.4
PL	2.5	3.0	3.6	4.1	4.4	3.8	3.0	2.2	1.5	1.0
SI	1.8	3.2	3.6	4.3	5.2	5.3	4.7	4.3	3.1	2.2
SK	6.5	9.2	9.2	9.4	10.0	9.3	7.6	5.8	5.1	4.0

Source: Eurostat.

The share of persons working part-time is rising gradually in the Czech Republic, but is still well below the levels in Germany and Austria...

Part-time employees
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	4.7	5.1	4.6	4.9	5.7	5.4	5.2	5.6	6.0	6.2
AT	24.4	24.9	25.0	25.7	26.5	27.4	27.7	28.2	28.2	27.6
DE	25.5	25.7	25.9	25.9	26.7	26.6	26.8	26.8	26.9	26.8
PT	8.4	8.4	10.1	11.0	10.8	9.9	9.6	9.2	8.6	7.8
HU	5.2	5.5	6.4	6.7	6.4	6.0	5.7	4.7	4.3	4.2
PL	7.3	7.3	7.0	6.9	6.9	6.8	6.6	6.2	6.3	6.2
SI	8.6	9.2	8.6	8.5	8.5	9.2	9.3	8.9	9.6	9.1
SK	3.4	3.7	3.9	3.9	4.5	5.0	5.7	5.7	5.7	4.8

Source: Eurostat.

...but a rising supply of part-time jobs is fostering an increase in the rate of economic activity in the Czech Republic.

Rates of economic activity in the 15–64 age category
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	70.1	70.2	70.5	71.6	72.9	73.5	74.0	75.0	75.9	76.6
AT	74.3	74.4	74.6	75.1	75.5	75.4	75.5	76.2	76.4	76.8
DE	76.3	76.7	77.3	77.2	77.6	77.7	77.6	77.9	78.2	78.6
PT	73.4	73.7	73.6	73.4	73.0	73.2	73.4	73.7	74.7	75.1
HU	61.2	61.9	62.4	63.7	64.7	67.0	68.6	70.1	71.2	71.9
PL	64.7	65.3	65.7	66.5	67.0	67.9	68.1	68.8	69.6	70.1
SI	71.8	71.5	70.3	70.4	70.5	70.9	71.8	71.6	74.2	75.0
SK	68.4	68.7	68.7	69.4	69.9	70.3	70.9	71.9	72.1	72.4

Source: Eurostat.

The regional differences in unemployment rates in the Czech Republic are medium-high compared to the other countries under review and are roughly the same as in Germany.

Coefficients of variation of the unemployment rate
(%)

	NUTS II regions										NUTS III regions									
	08	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
CZ	44	34	31	28	33	31	30	33	33	30	46	35	32	29	34	32	30	33	34	32
AT	39	34	37	40	43	39	43	45	46	47	41	36	39	42	45	41	45	47	49	49
DE	45	37	36	41	40	39	39	37	32	32	51	43	42	48	47	46	-	-	-	-
PT	19	18	20	13	14	16	13	14	14	13	-	-	-	-	-	-	-	-	-	-
HU	43	31	23	26	23	21	31	34	41	46	49	36	28	30	27	25	36	37	47	51
PL	18	20	14	14	15	16	18	19	23	28	27	29	26	26	27	26	27	29	33	38
SI	-	-	-	-	-	-	-	-	-	-	-	-	22	28	21	19	22	21	21	17
SK	41	32	27	32	31	29	28	26	29	37	51	38	29	33	33	31	30	31	33	42

Note: The coefficient of variation is the ratio of the standard deviation weighted by region size to the average unemployment rate in per cent.
Source: Eurostat (LFS).

The willingness of the domestic population to migrate within the Czech Republic remains low.

Internal migration
(per 1,000 inhabitants)

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
CZ	22	23	22	22	22	23	23	24	23	-
AT	37	37	38	39	39	40	43	44	42	41
DE	44	44	47	47	48	49	53	54	48	-
HU	21	20	20	19	19	22	22	26	27	29
PL	11	11	11	10	10	11	10	10	11	11
SI	48	52	53	55	55	55	53	54	54	50
SK	15	16	16	15	16	17	17	18	18	18

Note: Migration between municipalities (HU, PL and SI – all changes in permanent residence). Data are not available for Portugal. The calculations do not take into account differences in the sizes of territorial units in the chosen countries.
Source: Statistical yearbooks, Eurostat, CNB calculations.

The geographical mobility of the labour force in the Czech Republic is gradually rising via an increasing share of foreign nationals in the population.

Shares of foreign nationals in the population
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	3.9(1.4)	4.0(1.3)	4.0(1.3)	4.0(1.4)	4.0(1.5)	4.1(1.6)	4.3(1.7)	4.5(1.9)	4.8(2.0)	4.9(2.1)
AT	10.3(3.8)	10.5(4.0)	10.8(4.2)	11.3(4.5)	11.8(4.9)	12.5(6.1)	13.3(6.6)	14.5(7.1)	15.2(7.5)	15.7(7.9)
DE	8.8(3.1)	8.7(3.1)	7.6(2.8)	7.9(3.0)	8.3(3.3)	8.7(3.9)	9.3(4.3)	10.5(4.6)	11.2(4.8)	11.7(5.1)
PT	4.2(0.8)	4.3(0.9)	4.2(1.0)	4.1(1.0)	4.0(1.0)	3.8(1.0)	3.8(1.0)	3.8(1.0)	3.9(1.1)	1.7(0.8)
HU	1.9(1.1)	2.0(1.2)	2.1(1.3)	1.4(0.8)	1.4(0.8)	1.4(0.8)	1.5(0.8)	1.6(0.9)	1.5(0.8)	1.5(0.8)
PL	-	0.2(0.1)	0.2(0.1)	0.2(0.1)	0.2(0.1)	0.3(0.1)	0.3(0.1)	0.3(0.1)	0.5(0.1)	0.6(0.1)
SI	3.5(0.2)	4.0(0.2)	4.0(0.3)	4.2(0.3)	4.4(0.3)	4.7(0.8)	4.9(0.8)	5.2(0.9)	5.5(0.9)	5.9(1.0)
SK	1.1(0.9)	1.2(1.0)	1.3(1.0)	1.3(1.0)	1.3(1.0)	1.1(0.8)	1.1(0.9)	1.2(0.9)	1.3(1.0)	1.3(1.0)

Note: Foreign nationals from EU countries are given in parentheses.
Source: Eurostat, CNB calculations.

The ratio of the minimum wage to the average wage has increased markedly in recent years, but is still the lowest among the countries under review.

Minimum wage
(% of average wage)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	34.3	33.3	32.4	31.6	32.6	32.8	34.4	35.5	37.1	38.5
DE	-	-	-	-	-	-	41.9	41.0	41.7	40.5
PT	42.8	42.4	42.2	42.9	42.7	44.1	43.7	45.4	47.7	48.9
HU	38.3	38.0	38.6	42.5	43.3	43.3	43.2	43.4	44.5	43.7
PL	42.2	42.0	41.7	43.5	44.6	45.3	45.5	46.3	47.1	46.2
SI	44.2	50.5	51.7	52.2	53.2	52.8	52.4	51.7	51.3	51.7
SK	35.7	36.0	36.1	35.6	36.0	35.4	36.9	37.7	38.5	39.7

Note: No minimum wage was defined at the national level in Germany until 2014; a minimum wage was introduced in January 2015. In Austria the minimum wage is only defined for some specific occupations and represents around 30% of the average wage.
Source: Eurostat.

The ratio of the minimum wage to the wage in the first (lowest) decile of the wage distribution is traditionally high in low-skilled occupations and has risen further in recent years.

Ratio of the minimum wage to the gross monthly wage in selected professions
(%)

	Minimum wage / 1st decile									
Main employment class	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Total for Czech Republic (business sector)	64.0	63.5	71.6	71.2	71.7	72.9	77.1	77.8	78.6	80.4
elementary occupations	88.6	89.1	90.5	89.4	90.0	93.0	95.6	95.4	95.5	96.5
services and shop workers	86.1	86.5	89.1	88.8	87.5	88.1	91.0	90.8	90.9	91.7
qualified workers in agriculture, forestry and fishing	68.1	65.2	67.2	67.7	67.2	67.8	76.5	78.3	81.3	82.7

Source: Average Earnings Information System (Ministry of Labour and Social Affairs), CNB calculations.

Overall labour taxation was lower in the Czech Republic than in advanced neighbouring countries (Germany and Austria) in the period under review.

Overall labour taxation
(%)

	100% of average wage					67% of average wage				
	2008	**2015**	**2016**	**2017**	**2018**	**2008**	**2015**	**2016**	**2017**	**2018**
CZ	43.4	42.8	43.0	43.4	43.7	40.1	40.0	40.3	40.8	41.4
AT	49.0	49.6	47.3	47.4	47.6	44.5	45.1	43.0	43.1	43.3
DE	51.3	49.4	49.5	49.6	49.5	46.5	45.3	45.4	45.4	45.4
PT	36.9	42.1	41.6	41.4	40.7	32.2	36.3	36.5	36.6	36.5
HU	54.1	49.0	48.2	46.2	45.0	46.8	49.0	48.2	46.2	45.0
PL	34.7	35.7	35.6	35.7	35.8	33.6	35.0	34.9	35.0	35.1
SI	42.9	42.6	42.7	42.9	43.3	40.3	38.6	38.7	40.0	40.0
SK	38.8	41.4	41.5	41.6	41.7	36.1	38.8	39.0	39.2	39.5

Note: Income tax and contributions paid by employees and employers as a percentage of total labour costs. Data for employees (childless individuals) earning 100% (left-hand part of the table) and 67% (right-hand part of the table) of the average wage.
Source: OECD.

The configuration of the Czech tax and social system leads to a relatively low incentive to return from unemployment to employment.

Unemployment trap
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	79.5	80.0	80.2	80.1	80.1	80.2	80.3	80.4	80.6	80.7
AT	79.9	80.4	74.8	74.8	74.6	74.3	73.9	72.0	72.1	71.6
DE	75.2	73.5	73.3	73.3	73.0	73.1	73.1	73.3	73.3	73.2
PT	80.7	137.4	138.1	101.0	101.0	101.0	80.3	80.4	80.4	80.3
HU	80.6	79.9	79.6	79.5	78.8	78.6	78.4	78.1	78.5	78.5
PL	75.6	81.0	80.1	80.3	80.4	78.9	78.0	77.1	75.9	75.1
SI	83.4	83.2	89.7	89.5	89.8	89.7	89.6	87.2	88.3	78.3
SK	54.7	55.5	57.6	57.8	58.0	58.7	48.5	49.4	50.6	51.9

Note: The unemployment trap measures the proportion of gross income that is taken away when an unemployed person enters employment due to higher taxes and social security contributions and the loss of unemployment benefit and other social benefits. The figures are based on a model example of an unmarried, childless individual with a wage of 67% of the average wage. More recent data are unavailable.
Source: European Commission (Tax and benefits).

The low wage trap indicates a relatively low incentive to seek better-paid work, as after a wage increase from 67% to 100% of the average, roughly half of the increase in gross income is taken away due to the configuration of the tax and social system.

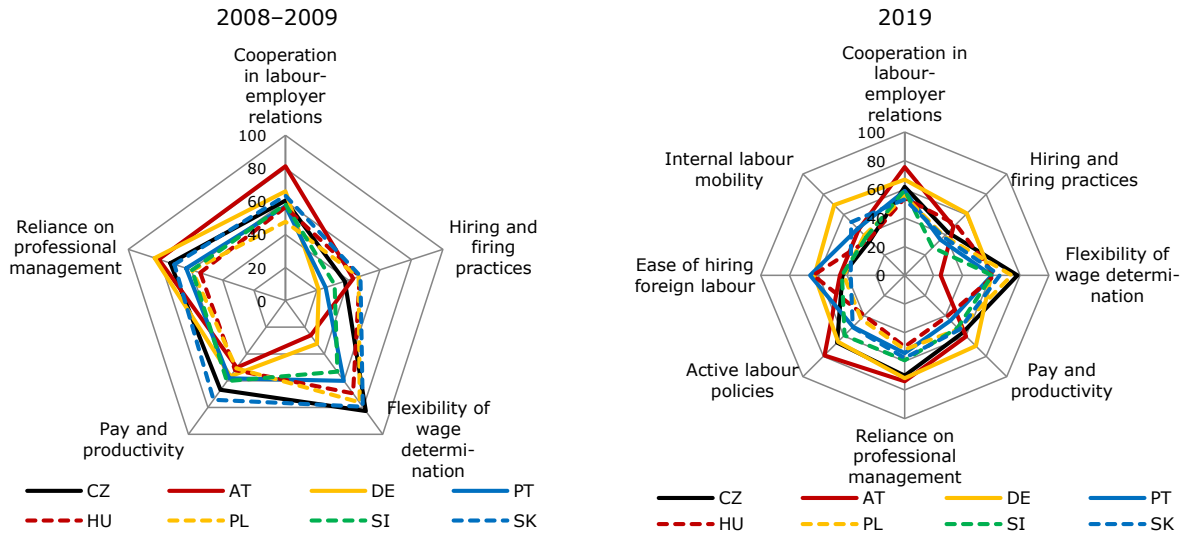
Low wage trap
(%)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CZ	21.3	35.5	35.8	35.5	35.4	36.4	37.5	38.8	40.9	47.3
AT	49.7	50.7	49.2	47.7	46.2	46.4	46.7	43.3	43.3	43.7
DE	57.6	53.6	50.0	47.8	46.9	45.6	44.4	52.6	51.4	49.0
PT	19.4	21.0	24.3	22.8	26.6	25.5	25.5	25.4	25.9	26.5
HU	67.7	50.2	43.3	38.9	36.5	36.4	34.5	33.5	33.5	33.5
PL	42.1	45.8	45.0	44.5	46.7	47.4	53.4	54.6	90.5	87.2
SI	62.3	61.7	61.3	30.6	30.2	30.6	30.9	31.2	32.0	33.2
SK	13.4	13.5	20.5	20.5	20.2	21.2	22.2	23.4	24.9	26.9

Note: The low wage trap measures the proportion of gross income that is taken away due to the combined impact of income taxes, social security contributions and the loss of benefits when gross income increases from 67% to 100% of the average income of an employee in the business sector. This indicator is compiled for persons living as a couple, only one of whom earns an income, with two children. More recent data are unavailable.
Source: European Commission (Tax and benefits).

In an international GCI comparison, the Czech Republic continues to rank among the leaders in market competitiveness.

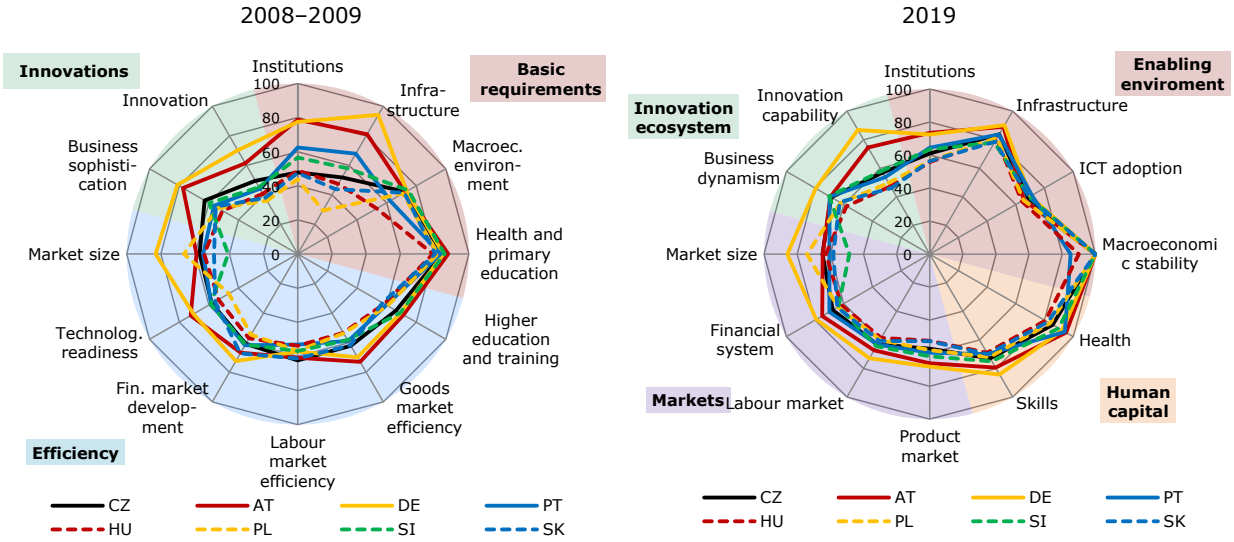
Global Competitiveness Index 4.0 – labour market scores



Note: As from 2018, the GCI for the labour market is broken down into new categories. For each category, it now takes values ranging from 0 to 100, where a higher index value means higher competitiveness in the relevant area. To aid comparison, the 2008/2009 levels are normalised according to the new index methodology.
Source: World Economic Forum (2009, 2019).

The competitiveness of the Czech economy has increased across most of the monitored areas over the last ten years.

Global Competitiveness Index – overall scores



Note: As from 2018, the GCI is broken down into new categories. For each category, it now takes values ranging from 0 to 100, where a higher index value means higher competitiveness in the relevant area. To aid comparison, the 2008/2009 levels are normalised according to the new index methodology.
Source: World Economic Forum (2009, 2019).

Selected scores for the institutional conditions for doing business remain at a similar level to those in Austria.

Conditions for starting and closing a business
(scores in given category; country rankings in given year in parentheses)

	Starting a business							Closing a business						
	13	**14**	**15**	**16**	**17**	**18**	**19**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
CZ	79.5 (110.)	81.3 (90.)	81.3 (88.)	83.0 (81.)	83.5 (81.)	82.1 (115.)	82.1 (134.)	78.8 (20.)	79.1 (20.)	79.3 (22.)	79.6 (26.)	79.8 (25.)	80.0 (15.)	80.1 (16.)
AT	80.0 (113.)	82.8 (101.)	82.8 (106.)	83.1 (111.)	83.1 (118.)	83.2 (118.)	83.2 (127.)	78.7 (16.)	78.8 (16.)	78.9 (18.)	78.9 (20.)	77.4 (23.)	77.5 (21.)	77.4 (22.)
DE	81,73 (103.)	81,36 (110.)	82.7 (107.)	83.4 (114.)	83.5 (113.)	83.6 (114.)	83.7 (125.)	91.7 (3.)	91.8 (3.)	91.9 (3.)	92.3 (3.)	90.3 (4.)	90.1 (4.)	89.8 (4.)
PT	92,44 (10.)	90,98 (10.)	91.0 (31.)	91.0 (32.)	90.9 (48.)	90.9 (57.)	90.9 (63.)	83.9 (11.)	79.8 (9.)	80.6 (8.)	81.2 (7.)	79.7 (15.)	80.0 (16.)	80.2 (15.)
HU	89.3 (24.)	86.6 (56.)	87.1 (55.)	87.3 (75.)	87.6 (79.)	87.9 (82.)	88.2 (87.)	51.9 (64.)	52.9 (64.)	53.7 (63.)	54.4 (63.)	54.8 (62.)	55.0 (65.)	55.0 (66.)
PL	82.5 (80.)	82.6 (80.)	82.7 (102.)	82.8 (107.)	82.8 (120.)	82.8 (121.)	82.9 (128.)	68.6 (30.)	69.7 (31.)	70.4 (33.)	76.4 (27.)	77.7 (22.)	76.5 (25.)	76.5 (25.)
SI	94.4 (14.)	94.4 (14.)	94.5 (45.)	94.6 (49.)	94.7 (46.)	92.9 (38.)	93.0 (41.)	62.9 (39.)	62.9 (41.)	83.4 (12.)	84.0 (12.)	83.7 (10.)	83.7 (9.)	84.4 (8.)
SK	78.5 (83.)	80.3 (71.)	81.8 (64.)	81.9 (68.)	82.0 (83.)	82.0 (127.)	84.8 (118.)	69.7 (28.)	69.9 (30.)	70.0 (34.)	70.5 (35.)	66.1 (42.)	66.9 (42.)	65.5 (46.)
No. of countries	189	189	189	190	190	190	190	189	189	189	190	190	190	190

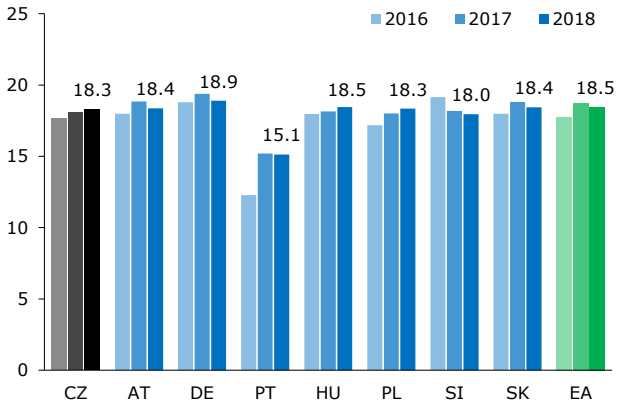
Note: Scores for conditions for starting and closing a business take values ranging from 0 to 100, where a higher value means better conditions. Starting a business: number of procedures, time (days), cost and minimum capital requirements in % of income per capita. Closing a business: time (years), cost in % of total assets and recovery rate in cents on the dollar. The country rankings include subsequent data revisions (more information can be found at http://www.doingbusiness.org/).
Source: World Bank (2019).

2.3 THE BANKING SECTOR AND ITS SHOCK-ABSORBING CAPACITY

- Capital position
- Profitability
- Liquidity position
- Credit risk

The capital ratio indicates high resilience of the banking sector.

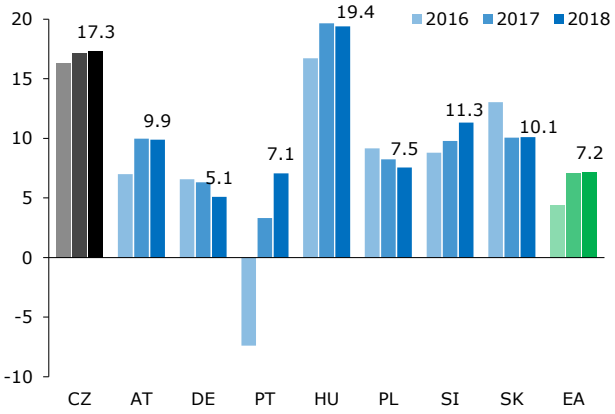
Capital ratios
(%)



Note: The capital ratio is the ratio of a bank's capital to its risk-weighted assets. EA represents the GDP-weighted average of the euro area member countries.
Source: IMF.

Return on equity remains high.

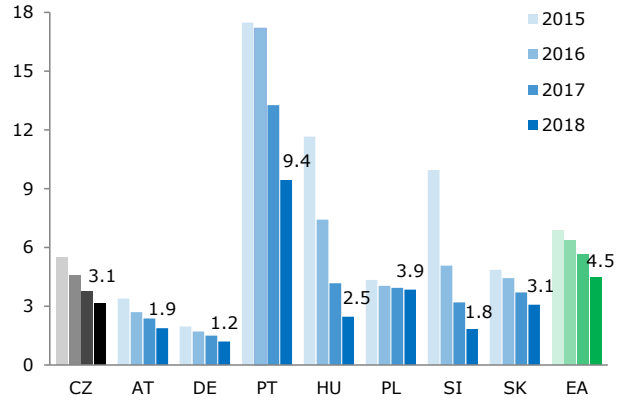
Return on equity (RoE)
(%)



Note: EA represents the GDP-weighted average of the euro area member countries.
Source: IMF, Deutsche Bundesbank.

Non-performing loans continue to fall.

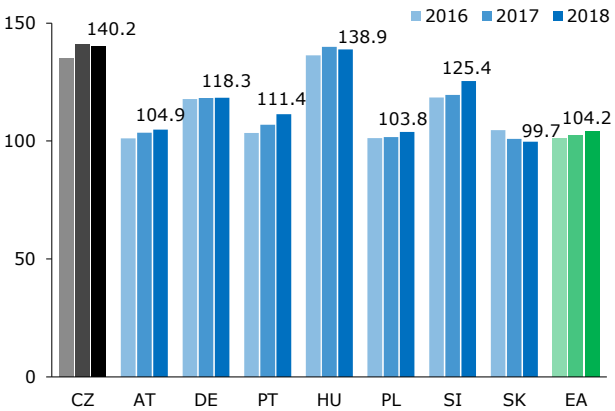
Non-performing loans
(% of total bank loans)



Note: EA represents the GDP-weighted average of the euro area member countries.
Source: IMF, CNB, Deutsche Bundesbank.

The ratio of deposits to loans remains high in the Czech Republic.

Deposit-to-loan ratios
(%)



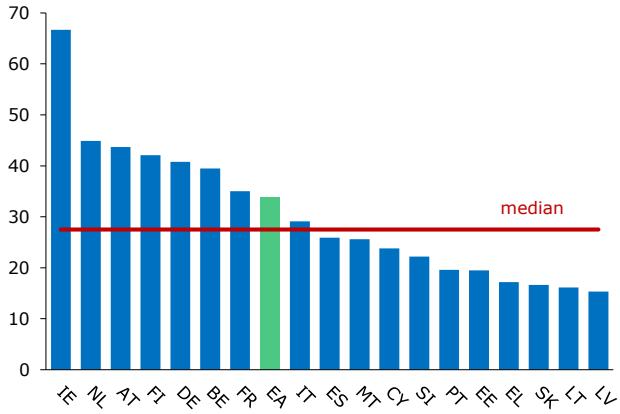
Source: ECB, national central banks.

3 ECONOMIC ALIGNMENT OF EURO AREA COUNTRIES

- Convergence of euro area countries' wealth levels
- Public finance sustainability
- Business cycle alignment
- Monetary policy transmission (interest rate channel)
- Financial cycle alignment as captured by credit growth
- Inflation alignment

Economic performance remains very heterogeneous across euro area countries...

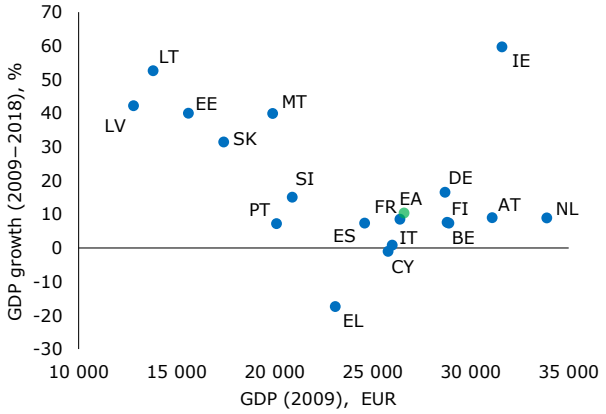
GDP per capita in euro area countries
(2018, GDP at current prices in EUR thousands)



Note: Luxembourg is not included in either of the charts due to the many specificities of its economy, which result in exceptionally high GDP per capita.
Source: Eurostat.

...with real convergence taking place in new member countries only...

Beta-convergence of real GDP in euro area countries

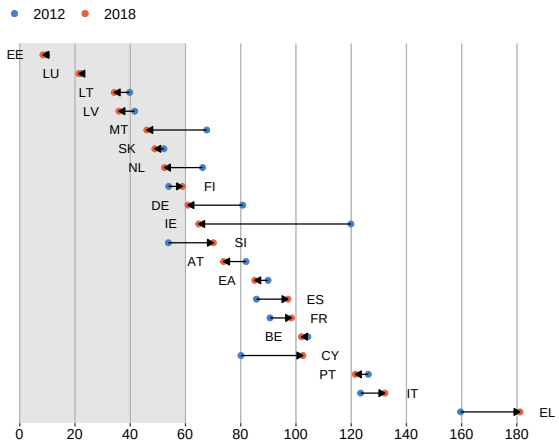


Note: The chart depicts the relation between GDP growth per capita in each country and its initial level (beta-convergence).
Source: Eurostat.

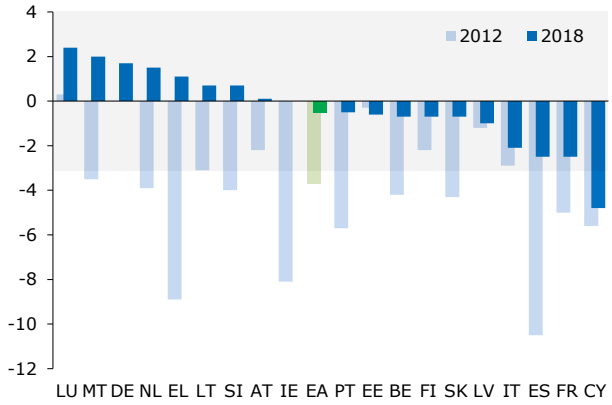
...while the countries of the southern periphery have recorded a decline or stagnation in performance, partly due to public finance consolidation; however, their general government debt-to-GDP ratios have not fallen.

Fiscal positions of euro area countries

General government debt (% of GDP)



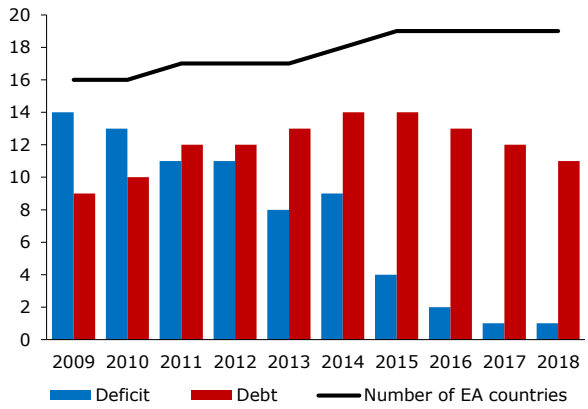
General government balance (% of GDP)



Note: Countries in the grey area are compliant with the Stability and Growth Pact (SGP) criterion. The SGP sets limits on government deficits (3% of GDP) and debt (60% of GDP). The starting year (2012) was chosen to capture the negative fiscal effects of the financial crisis (such as rescue programmes in banking sectors financed from state budgets).
Source: Eurostat.

Fiscal indiscipline is a long-standing problem in the euro area...

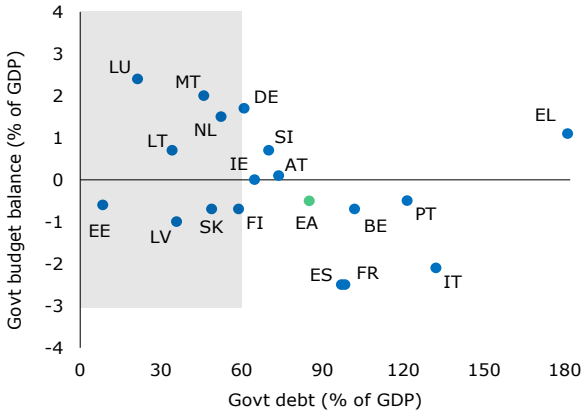
Non-compliance with the fiscal criteria
(number of countries non-compliant with the Stability and Growth Pact)



Note: Number of countries non-compliant with the deficit and debt criteria.
Source: Eurostat, European Commission, CNB calculations.

...and only eight countries are currently compliant with both the debt and deficit criteria.

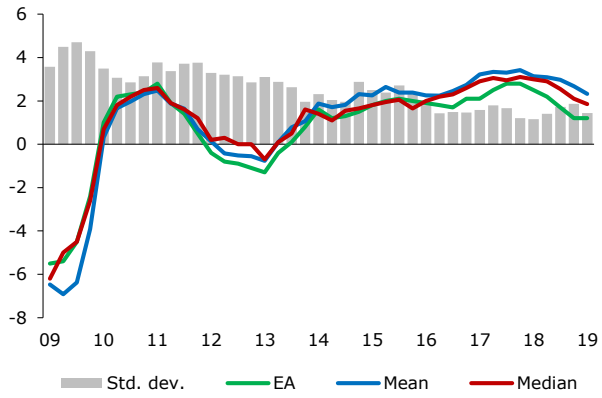
Fiscal positions of euro area countries
(2018)



Note: Countries compliant with the Stability and Growth Pact lie in the grey area.
Source: Eurostat.

The public finance situation is being aided by economic growth, which, however, has been slowing since the middle of last year...

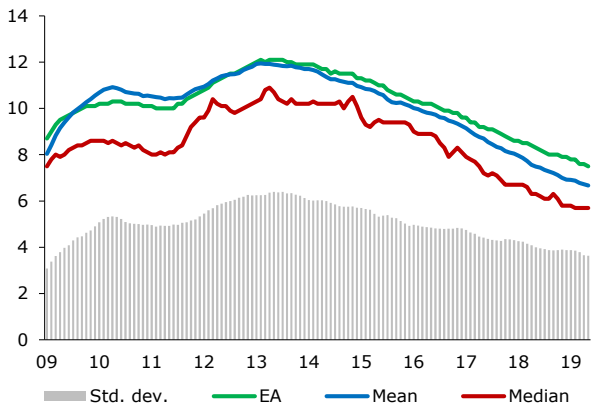
Real GDP growth in euro area countries
(%)



Note: The mean series depicts the unweighted arithmetic mean of GDP growth in the given quarter across euro area countries. Data for Ireland were not included due to exceptionally high growth in 2015, which exceeded 20% owing to the relocation of the headquarters of several international corporations to Ireland. The source series are seasonally adjusted.
Source: Eurostat, CNB calculations.

...but the labour market situation continues to improve.

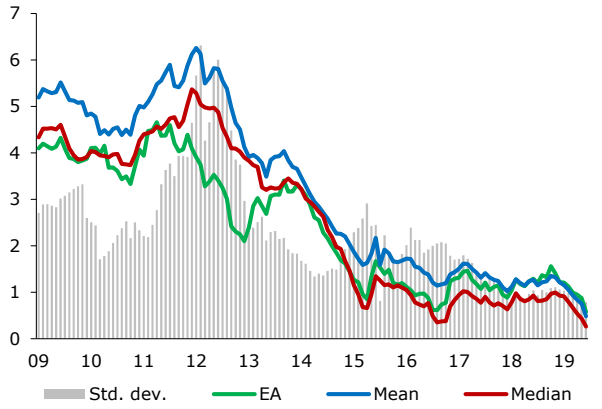
Unemployment in euro area countries
(%)



Note: The mean series depicts the unweighted arithmetic mean of unemployment in the given month across euro area countries. The source series are seasonally adjusted.
Source: Eurostat, CNB calculations.

Although the ECB ended its asset purchase programme at the end of this year, government bond yields have kept falling...

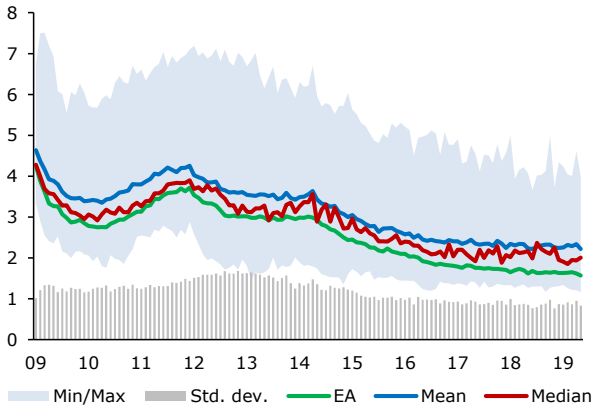
Long-term government bond yields in euro area countries
(%)



Note: Bond yields for the convergence criteria The bond maturity is about ten years. Estonia is not included because the time series is not available. The EA series is a weighted average of ten-year euro area government bonds.
Source: ECB (including the EA series), CNB calculations.

...and interest rates on client loans are also hovering around historical lows.

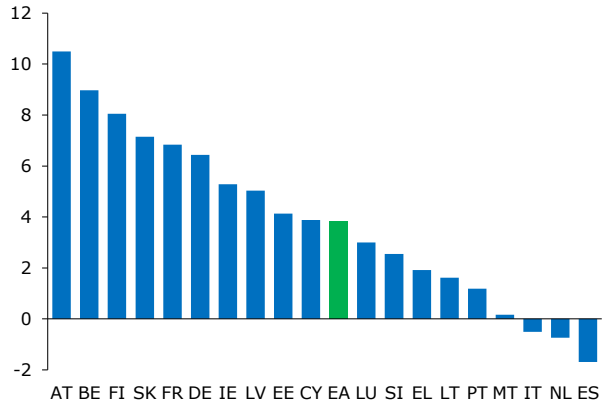
Funding costs of non-financial corporations
(%)



Note: The composite indicator comprises a weighted average of short-term and long-term loans to non-financial corporations.
Source: ECB (MIR database), CNB calculations.

Bank loans to domestic non-financial corporations are still declining in some countries despite significantly easier monetary policy…

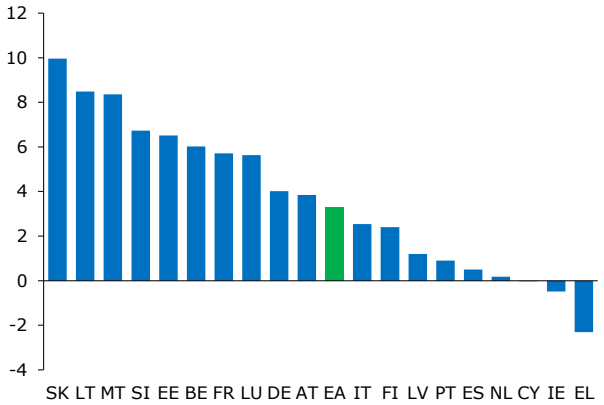
Growth in bank loans to domestic non-financial corporations
(y-o-y, in %)



Note: Annual growth in loans provided by monetary financial institutions; average growth rates in the first six months of 2019.
Source: ECB (BSI database).

…but the volume of loans to households is rising in almost all countries, its high growth rates in some countries reflecting an expansion of mortgage lending.

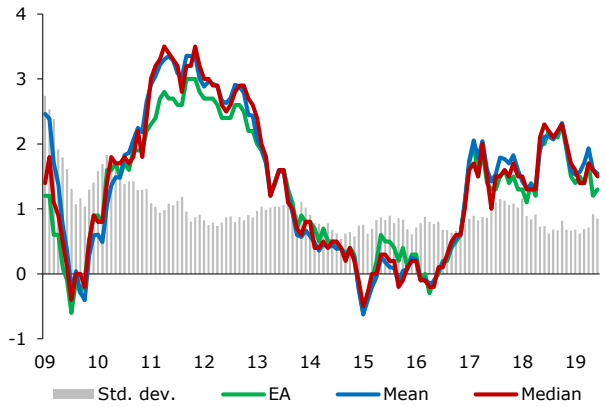
Growth in bank loans to households
(y-o-y, in %)



Note: Annual growth in loans provided by monetary financial institutions; average growth rates in the first six months of 2019.
Source: Eurostat, CNB calculations.

Headline inflation has fluctuated in the past year, reflecting movements in energy prices…

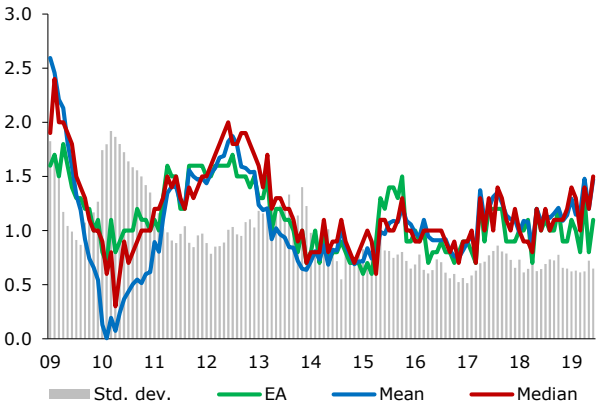
Headline inflation in euro area countries
(y-o-y, %)



Note: The mean series depicts the unweighted arithmetic mean of inflation in the given year across euro area countries.
Source: Eurostat, CNB calculations.

…while core inflation is still around 1%…

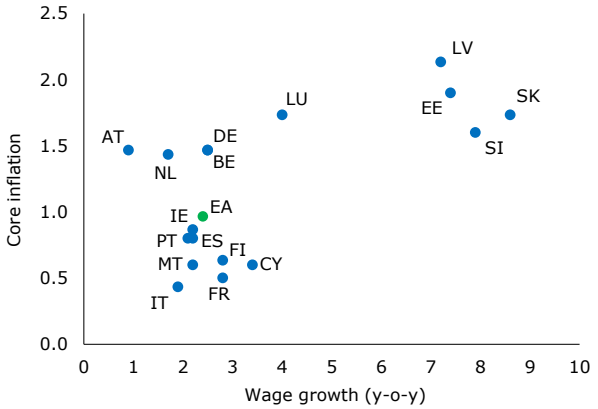
Inflation excluding energy, food, alcohol and tobacco prices
(y-o-y, %)



Note: The mean series depicts the unweighted arithmetic mean of inflation in the given year across euro area countries.
Source: Eurostat, CNB calculations.

...and its dispersion across euro area countries reflects differences in wage growth, among other factors.

Growth in wage costs, core inflation
(2019 Q1, y-o-y, %)



Note: The wage growth series are seasonally adjusted; data for Greece are not available. Data for Lithuania are not shown in light of an exceptionally large increase in wage costs in 2019 Q1.
Source: Eurostat.

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