Readiness of the Czech Republic to Join the Euro Area

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Abstract

The Czech Republic has been a member of the European Union since 2004. As a Member State, it is obliged to join the euro area upon meeting all the Maastricht criteria. There is still no fixed date for adopting the single European currency. The Czech Republic is failing to meet some criteria. There are ongoing discussions about joining the euro among experts, bank representatives, politicians, entrepreneurs, representatives of the Czech Chamber of Commerce and various associations, economics students and the general public. The aim of this paper is to assess the ongoing fulfilment of the Maastricht convergence criteria in the Czech Republic and to identify the relationship between actual and perceived inflation. The paper reflects new aspects, which were generated by the recent development on financial markets during the last 2 years, including COVID-19 and Russian attack to Ukraine. Due to the fact, that not all statistics reflects recent development, some tables and charts are not reflecting this for hundred percent. The analyses carried out reveal that the only criterion that is currently met is the level of public debt (sustainability will be assessed at the time of application). Smooth adoption of the euro by the public is associated with an increased perception of inflation above actual inflation. This situation should be addressed by economic policy actors in preparation for joining the euro area. The importance of a government communication and explanation campaign was confirmed by countries in a similar position. Since February this year, Europe and the whole world have been facing a new geopolitical situation. There are voices calling for Europe to become stronger, more compact, perhaps move towards a federation, including a strengthening of the common currency's position. Therefore, this is a highly topical issue. The final decision in the Czech Republic to start the process of adopting the euro and to set the date for joining the euro area rests with the Czech Government in cooperation with the Czech National Bank.

Keywords

European Union, euro area, Maastricht criteria, actual inflation, perceived inflation, Czech Republic

JEL Codes

F6, F64, Q5, Q56

DOI

http://dx.doi.org/10.37355/acta-2022/2-03

Introduction

Foreign authors seek answers to questions such as: what is new, what is good and what is relevant for current and future euro area countries in modern monetary theory (Levoie, 2022), whether it is possible to trace the impact of deteriorating fiscal conditions of euro area countries on bank lending margins (Katsampoxakis, 2022), how far the European South and the European North of euro area countries diverge or converge in the process of European integration (Kostis, 2022), how to interpret, understand and parameterise asymmetries in the economies of specific euro area countries (Dellepiane-Avellaneda et al., 2022).

Germany in particular (also for the sake of the monetary union's longevity) insisted that entry into the union should not be automatic. Countries had to demonstrate an environment of price stability (Baldwin, Wyplosz, 2013). Countries seeking to join the union had to meet five convergence criteria. The entry requirements, also known as the Maastricht convergence criteria, aim to assess the degree of economic convergence. They also serve the purpose of eliminating the emergence of any potential threats to the euro area, i.e. ensuring the ability of the candidate country to integrate smoothly into the euro area monetary regime without creating instability for the country itself and for the euro area as a whole (Dědek, 2013).

According to Aytac (2006), in the framework of the Maastricht convergence criteria, the primary condition for fiscal policy is budgetary discipline, which is based on the reduction of public debt and budget deficit. Pitruzzello (1997) examines the attempts of European political parties to restructure their welfare systems to achieve the required deficit and debt reduction criteria. Bektas, Sarac (2021) examine the fiscal rules applied in Germany, Britain, Spain and Greece between 1998 and 2018 by analysing the fulfilment of five criteria, two of which are financial and three economic. They assess whether the objective of improving macroeconomic performance while limiting the policy use of public resources is being met. They discuss whether the criteria guarantee a competitive future for the European Union.

Medium- and long-term debt sustainability through declining budget deficits and established fiscal discipline have become the focus of EU fiscal rules. Furthermore, constraints have been set on inflation, which is considered one of the performance variables for countries, and there are also rules for the long-term interest rate, which link it to the real economy (Kopits, Symansky, 1998).

In order to fulfil the objective of the paper, we should introduce the individual Maastricht convergence criteria and the theories associated with the concepts of actual and perceived inflation. The following part of the theoretical background will be devoted to this issue, prepared by desk-research.

1 Review of the Literature

Economic integration can be seen as an effective instrument for integrating a national economy into the global economic system. However, according to Koné (2012),

the concept of economic integration is not consistent in terms of linguistic interpretation. This confusion is caused by differing perceptions of the concept, which often go beyond purely economic categories. In other literature, one may come across terms such as regionalisation, regionalism, regional economic integration (Redda, 2021), regional economic cooperation (Omar et al., 2020), regional economic areas (Khawaja, Gilgid-Baltistan, 2021), regional economic blocs (Arreyndip, 2021) or regional trade agreements (Stuchlíková et al., 2021). All of these concepts relate to the phenomenon of regional economic integration, and to economic integration in more general terms. One of the other examples of defining economic integration is the division into macro and micro integration. Macro integration refers to the implementation of relations between governments of integrating countries and micro integration is the development of cooperation between corporate entities (Šíbl, 2000).

Nowadays, monetary integration is a rather attractive and debated topic in many different perspectives. Akalpler (2021) published a study that aimed to investigate the effects of wages, unemployment, and the consumer price index on real gross domestic product, which in optimal monetary area theory implies that countries with higher factor mobility can realise significant gains in the monetary area. However, the defined hypothesis was not proven on the model countries of Germany and Poland. The study by Tohmo et al. (2021) focused on assessing the impact of the Economic and Monetary Union on global high-tech (HT) exports. Among other things, the findings suggested that the effect of EMU on HT exports is country specific. Gehringr, König (2021) study the synchronisation process of business cycles in the European Union and the euro area, as well as the factors influencing the steps of monetary integration. Tomat (2021) analyses the policy of an independent central bank in a monetary union. With homogeneous preferences, the advantages and disadvantages of a committed monetary union policy relative to a discretionary policy for each new candidate or existing member country are a function of its relative size and degree of asymmetry. The degree of convergence of Visegrád Group countries at the national and NUTS 2 level is compared by Řežábek et al. (2022).

1.1 Maastricht convergence criteria

The Treaty on the Functioning of the EU, known as the Maastricht Treaty, sets out the conditions for membership of the euro area. Therefore, the preconditions for economic integration and the economic criteria that assess the readiness of a candidate country to join the Economic and Monetary Union are known as the Maastricht criteria. Their purpose is to ensure a degree of economic convergence, i.e. the ability of the candidate country to integrate smoothly into the euro area monetary regime without creating instability for the country itself and for the euro area as a whole. The Maastricht criteria are assessed by the European Commission and the European Central Bank in Convergence Reports. This is performed either regularly at two-year intervals or exceptionally at a candidate's request. In order to join the euro area, all Maastricht criteria must be met simultaneously at the time of the evaluation (Maastricht treaty – http://data.europa.eu/eli/treaty/teu/sign).

The euro is being introduced in 11 countries for commercial and financial transactions. Banknotes and coins were introduced at a later date. The first countries to use the euro were Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Denmark, the UK and Sweden decide to stay out for the time being. Now there are 19 countries with euro. Countries had to meet the following criteria:

- **The first criterion concerns inflation.** "To qualify for membership of the monetary union, a country's inflation rate should not exceed by more than 1.5 percentage points the average of the three inflation rates achieved by the best-performing EU member states in terms of price stability" (Baldwin, Wyplosz, 2013). The results of these countries are also used for the following criterion. For example, when the first candidate countries joined, Greece did not meet this criterion and therefore its admission was initially postponed (Štěrbová, 2013),

- **The second criterion is the long-term interest rate**, which "may be no more than 2.5 percent higher than the rate in the three EU countries with the best price stability records" (Holman, online, 2006).

- **The third condition is participation in the ERM2 exchange rate mechanism**. Countries are required to participate in ERM2 for at least two years. It is important to ensure that candidate countries are able to function without distortions once they join the euro area. The criterion is precisely specified in the Treaty on the Functioning of the European Union, specifically in Article 140(1), which describes "the observance of the normal fluctuation margins provided for by the exchange-rate mechanism of the European Monetary System, for at least two years, without devaluing against the euro" (Eurlex, online, 2012). However, compliance with this criterion can only be assessed once the Czech Republic enters the ERM II exchange rate mechanism.

- **The fourth criterion limits the size of the government deficit.** This deficit must not exceed 3% of GDP. The criterion is not considered to be breached if the permissible limit is exceptionally exceeded for justified reasons, or if the budget deficit is being continuously and significantly reduced and approaches the three per cent threshold" (Lacina, 2007). In 2014 The Stability and Growth Pact (SGP) was agreed (GSP 2014). It consists of two main building blocks: the preventive arm and the corrective arm. In Preventive arms SGP allowed ranges in which the country-specific MTOs have to be set differ between the preventive arm of the SGP (EU law) and the „Fiscal Compact" (intergovernmental treaty): While the upper limit („surplus") is unspecified and identical in both frameworks, the lower limit („close to balance") is specified differently: if the debt-to-GDP ratio is higher than 60%, the lower limit is more stringent in the Fiscal Compact (structural deficit of 0.5% of GDP) compared to the preventive arm (structural deficit of 1% of GDP). If the public debt is lower than 60% of GDP, there is again no difference between the lower limits in both frameworks (structural deficit of 1% of GDP). In the corrective arm, progress by Member States is measured on the basis of „fiscal effort" in structural terms. If the improvement is in line with the Council recommendation, the Commission and/or Council conclude that „effective action" has been taken.

- **The fifth and final criterion is the maximum level of gross public debt.** The average debt level when the Maastricht Treaty was negotiated was 60% of GDP (Baldwin, Wyplosz, 2013). Therefore, the ceiling was set at the same level.

Table 1: Overview of euro area members and non-members

Euro area Member States	Non-euro area Member States	A Member State that has opted not to participate
1999 – Belgium, Finland, France, Ireland, Italy, Luxembourg, Germany, Netherlands, Portugal, Austria and Spain. 2001 – Greece 2007 – Slovenia 2008 – Cyprus, Malta 2009 – Slovakia 2011 – Estonia 2014 – Latvia 2015 – Lithuania	Croatia is ready to adopt the euro on 1 January 2023. Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Sweden	Denmark

Source: based on ec.europa.eu. [online]. Who is already a member of the euro area? 2021. [Cit. 2022-02-06]. Available at https://ec.europa.eu/info/business-economy-euro/euro-area/what-euro-area_cs

According to European Commission President Ursula von der Leyen, "Today, Croatia has made a significant step towards adopting the euro, our common currency. Less than a decade after joining the EU, Croatia is now ready to join the euro area on 1 January. This will make Croatia's economy stronger, bringing benefits to its citizens, corporations and society at large. Croatia's adoption of the euro will also make the euro stronger. Twenty years after the introduction of the first banknotes, the euro has become one of the most powerful currencies in the world, improving the livelihoods of millions of citizens across the Union. The euro is a symbol of European strength and unity. Congratulations, Croatia!" The progress made by Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania and Sweden towards joining the euro area is assessed as follows:

- only Croatia and Sweden meet the price stability criterion;
- the public finance criterion is met by all Member States except Romania (which is the only Member State subject to the Excessive Deficit Procedure);
- Bulgaria and Croatia meet the exchange rate criterion;
- Bulgaria, Croatia, the Czech Republic and Sweden fulfil the long-term interest rate criterion. (ec.europa.eu, online, 2022).

1.2 Actual and perceived inflation

When the theory talks about **actual inflation**, it means inflation measured by the statistical office of the country concerned. As such, inflation manifests itself in a long-term increase in the price level of goods and services, or a reduction in the purchasing power of monetary units. It is a process that is induced in the microeconomic and macroeconomic equilibrium, in the monetary sphere, but also in the sphere of the real economy. Market prices change during the reference period, but their movement may not be apparent. From a macroeconomic point of view, the overall price changes are very important. The overall price level of goods and services sold and purchased in the national economy is referred to as the price level. Inflation is an increase in the overall price level, not individual prices. Other concepts related to inflation are disinflation and deflation. Disinflation is a decline in the rate of inflation, or an attempt to end inflation. Deflation if a decline of the price level. Deflation most often expresses the opposite of inflation (Lisý, 2000). Novák, Šlosár (2008) define actual inflation as follows: it is primarily a monetary phenomenon, which means a devaluation of a country's monetary unit and manifests itself mainly in an increase in the overall price level of the economy. However, this negatively affects the whole real economy and its performance.

Price indices are used to measure inflation. A price index is a weighted average of the individual prices of a selected basket of representative goods and services in the two periods being compared, with the weight of the price of each good reflecting the economic importance of that good (Rojíček, 2016). The most important price indices include the consumer price index, the producer price index and the GDP deflator. We also include the cost-of-living index among the frequently monitored indices. It is based on the choice of goods and services that make up the consumer basket. The most widely used price index is the Consumer Price Index. It is used to express the impact of price level changes on households and their cost of living (Jurečka, 2017).

The issue of actual inflation has been studied by many academics from many points of view. Zobl, Ertl (2021) study inflation dynamics in emerging small open economies in Central and Eastern Europe and find new empirical evidence for the existence of a New-Keynesian Phillips Curve (NKPC). Abdul-Asis, Imhotep (2021) estimate bank responses during inflation targeting periods using Taylor rule. They question the logic of the prevailing upper and lower inflation target bounds. Crowley and Hudgins (2021) find that fiscal policy is most aggressive when economic growth is emphasised as a policy objective, while monetary policy is relatively more aggressive when the inflation rate is emphasised. Conflitti, Zizza (2021) examined whether inflation expectations of undertakings were significantly affected by wage growth and information on past, current and future inflation. Price equations that allow predicting future inflation are discussed by Fair (2021). Deryugina, Ponomarenko (2021) argue that there are several key components leading to an anticipation or lag in the relationship between money growth and inflation. Gries, Mitschke (2021) observe and evaluate the lack of investment in the macroeconomy, the effect on subdued inflation, and review current monetary policy challenges.

The topic of stabilising the economy through fiscal policy has been widely discussed for many decades. According to Feto et al. (2021), an increase in fiscal policy shock by one percent leads to a one-period rise in output and inflation by 0.104 and 0.03 percent. The effects of inflation targeting on public spending in the euro area are discussed by Coronel (2022). Chen et al. (2022) show that if fiscal behaviour follows its historical norm to eventually stabilise debt, current high debt levels produce only modest inflation; if confidence in those norms erodes, high debt may deliver substantially more inflation. Fiscal policy plays an important role in stimulating economic activity, but it also has a significant impact on ensuring monetary stability in the economy. A study by Asandului et al. (2021) aimed to analyse the asymmetric effects from fiscal policy on inflation and economic activity in twelve post-communist European countries. The results show that in the long run, the fiscal policy instrument negatively influences both inflation and economic activity; in the short run, the effects are not significant.

Economic growth is becoming a critical component of any country's development as it simultaneously raises living standards and eradicates poverty (Atigala et al., 2022). The essence of **perceived inflation** lies in the fact that although actual or measured inflation shows no increase, consumers (the public) subjectively believe that the changeover to the European currency will be associated with an increase in the prices of most goods, and consequently fear high household debt and a decline in the standard of living.

The relationship between perceived and actual inflation has taken on particular importance in the context of the price effects of the introduction of euro banknotes and coins and the associated recalculation of prices. While most experts considered the average price effect of such changeover to be moderate, the media emphasised individual, very sharp price changes and most consumers believed that the changeover would lead mainly to higher prices for goods (Hoffmann et al., 2006). The power of consumer biases in the context of presented, perceived, and expected inflation was examined by Ahn, Tsuchiya (2022). They established that expected inflation was strongly related to perceived inflation without a significant role for rationality in assessing the impact of actual inflation. Perceived inflation also supports the illusory perception of personal wealth, i.e. it implies rising expected expenditures relative to expected income (Connolly, 2022).

Some talk about a paradox of perceived inflation, a phenomenon that defies and seemingly contradicts common sense. The paradox of the discrepancy between perceived and actual inflation can be explained by the fact that food and some selected services (hairdressers, restaurants, etc.), which are among the more common items in the consumer basket, saw some price increases just as the euro was being introduced. Although prices of other goods fell or rose only slightly, this price movement was not perceived as intensely by the public. The perception of higher prices after the introduction of the euro, especially for durable goods, also stemmed from inconsistent comparisons between current euro prices, which are subject to ordinary inflation, and the national currency prices that existed when the national currencies were replaced by the euro. Citizens also tended to attribute all price increases to the euro, even though the causes may have been unrelated to the euro (zavedenieura.cz, online).

The apparent paradox in our perception also has another explanation. We are more sensitive to upward price movements because they strain our budgets. We tend to remember price movements of products and services that we consume regularly. The consumer basket for calculating inflation includes both types of products – those whose prices we remember and those whose value we are less likely to perceive. The share of products and services from both groups in the inflation calculation corresponds to the expenditure structure of the average household. In addition to the aforementioned explanations based on the imperfection of human observation, there is the fact that there is no such thing as an average household. Everyone's consumer basket is individually specific and varies in time, so their perception of inflation is more or less different from official data. One possible solution is to create an index of perceived inflation by removing items from the consumer basket to which consumers are less price sensitive for various reasons. In this thinned index, the remaining items will then be given more weight and will better match the empirical observations of the consumer. The idea of creating an index of perceived inflation is not new. Such an index has been used in Western European countries to explain the surprisingly small rise in official inflation after the adoption of the euro, which triggered a wave of upward price rounding. The rounding mainly happened in small but visible amounts, but the index of perceived inflation did not change dramatically (Sobíšek, 2014).

2 Data and methods

The data were drawn from data from the Czech Statistical Office (CZSO), press releases from ministries, publicly available analyses of the Czech National Bank (CNB), the Ministry of Finance, Eurostat, the European Central Bank, etc.

In general, the authors addressed the issues discussed in this paper and the different approaches to their solution through a descriptive method, which was supported by a technical analysis consisting in analysis and synthesis. Due to the extensive theoretical background, the authors have used the above methods to capture the most important findings, views and sequence of events related to the fulfilment of the Maastricht convergence criteria and the issue of actual and perceived inflation. In the review of literature, the authors relied on printed and electronic sources, monographic literature, contributions in proceedings, articles from Proquest, Web of Science, Ebsco, Scopus and other databases, expert journals, directives and regulations of EU institutions, and Czech legal norms.

Statistical and time series methods were the main methods used to assess the Maastricht convergence criteria. Time series means a chronological arrangement of data (results of observations) according to predetermined criteria, i.e. years, inflation, unemployment, etc. So-called statistical (stochastic) series are burdened with uncertainty, whereas in the case of deterministic series their behaviour can be clearly described by a mathematical formula. If we apply the theory of random processes, we can say that a stochastic time series represents a particular realisation of the corresponding random (stochastic) process (Křivý, online, 2012). Another method was prediction (forecasting development,

year-to-year changes, future environmental developments, etc.). It uses statistical methods, subjective methods (subjective probability estimation, etc.). Furthermore, the paper relies on the balance sheet statistics method, the Brachinger's approach for measuring the rate of perceived inflation based on statistical data, and the Diaz, Duarte, Rua method calculating perceived inflation using balance sheet statistics recalculated from consumer surveys.

3 Results

The aim of the analyses was to assess the fulfilment of the Maastricht convergence criteria in the Czech Republic over time. It also aimed to identify the relationship between actual and perceived inflation and, based on the inferred relationship, discuss measures to eliminate the growth of perceived inflation or actual inflation.

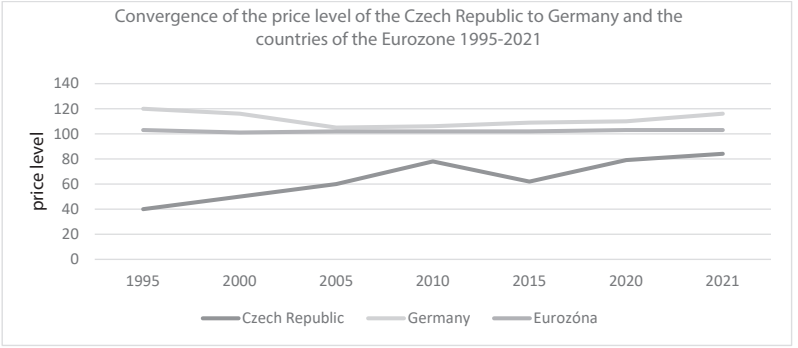
3.1 Analysis of the fulfilment of the Maastricht criteria in the Czech Republic

The current economic development, both within the countries using euro and in the Czech Republic, is significantly affected by the consequences of the coronavirus pandemic, high inflation, price volatility or shortages of raw materials, the energy crisis, the security of supply chains, the geopolitical risks posed by the conflict between Russia and Ukraine and related measures restricting economic activity. In the following part of the paper, the authors focus mainly on analysing the harmonisation of the Czech Republic's and the euro area's economic development, including the ability to absorb possible asymmetric shocks through other mechanisms after the loss of its own monetary policy.

3.1.1 Price stability criterion

The Czech economy has long been highly correlated with euro area countries, although cyclical alignment has gradually declined in recent years. In 2021, the economic level of the Czech Republic measured as GDP per capita in purchasing power parity will continue to converge towards the euro area average. However, the Czech economy has an above-average share of the industry sector in GDP compared to euro area countries. It can be concluded that the focus on the (automotive) industry is one of the risks in terms of possible asymmetric economic shocks. Closely related to this is the risk of a response from the single monetary policy of the European Union and the ability of central measures to eliminate specific impacts on the Czech economy.

Figure 1: Convergence of the price level of the Czech Republic to Germany and Eurozone countries 2011–2021

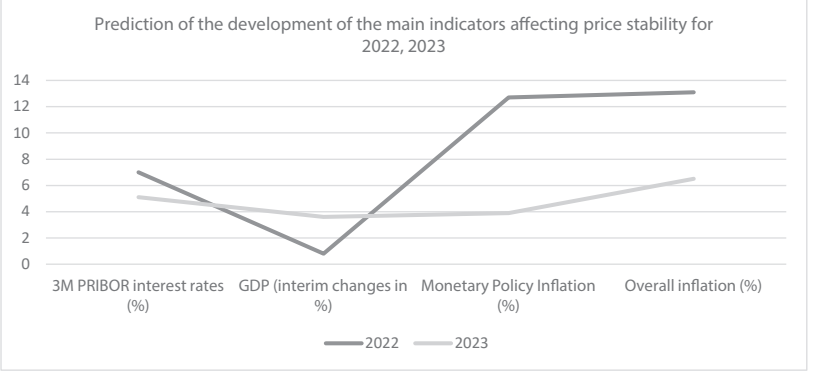


Source: processed by the authors according to the CNB, Continuous Analyzes of the degree of economic alignment of the Czech Republic with the Eurozone 1995–2021

Figure 1 shows that the Czech price level continues to converge towards the euro area with a tendency to slow down. Rising interest rates and inflation suggest that this trend will continue.

Price stability and its trends can be assessed on the basis of, among other things, forecasts of 3M PRIBOR (%), GDP (y/y in %), Monetary Policy Inflation (%), Headline Inflation (%), see Figure 2.

Figure 2: Prediction of the development of the main indicators affecting price stability for 2022, 2023



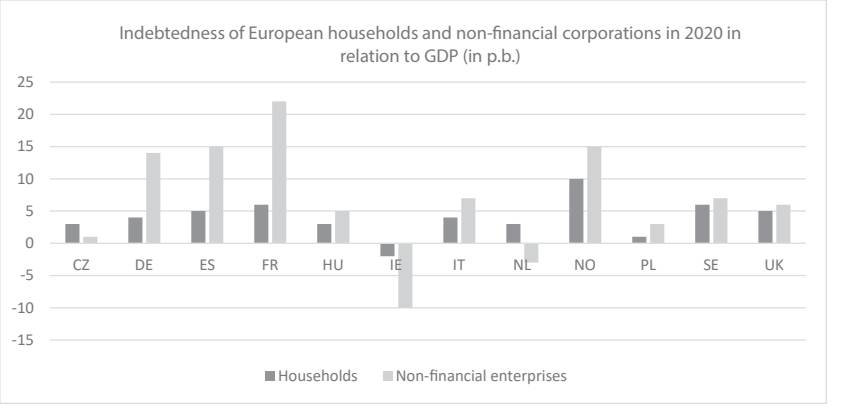
Source: processed by the authors according to the cnb.cz. [online]. Prognóza ČNB – jaro 2022. 5.5.2022. [Cit. 2022-07-06]. Dostupné z https://www.cnb.cz/cs/menova-politika/prognoza/

According to this figure, growth in domestic economic activity is expected to be stifled significantly in 2022 and accelerate significantly the following year. Consistent with the baseline scenario of the spring forecast is a further steep rise in market interest rates until the middle of this year, followed by a gradual decline from this autumn.

In the baseline scenario, the central bank sets interest rates to meet the 2% target at the monetary policy horizon. GDP growth will slow significantly this year and year-on-year economic activity will fall slightly in the second half of the year. The decline in household consumption, fixed investment and exports will contribute significantly to this development. Economic growth will pick up next year. Monetary policy inflation will be below headline inflation over the whole horizon. At the end of the monetary policy horizon, monetary policy inflation will fall close to the inflation target, thanks to the previous tightening of monetary conditions. Inflation will rise further in the second quarter of this year and, with the contribution of all its components, it will reach almost 20%. It will then gradually slow down and fall to single digits at the beginning of next year. During 2023, 2024, it will then further decrease, reaching close to the 2% target.

The level of indebtedness of the private sector (households and non-financial corporations) in the Czech Republic is also an important price stability indicator. This parameter is still well below the euro area average, but this certainly does not mean that the Czech financial sector is to converge more towards this level.

Figure 3: Changes in the indebtedness of European households and non-financial corporations in 2020 in relation to GDP (in p.b.)



Source: processed by the authors according to the FRAIT, Jan a MALINOVÁ [online]. Svět na konci pandemie: pyramida z dluhů. 25.6.2021. [Cit. 2022-02-26 Simona]. Dostupné z https://www.cnb.cz/cs/o_cnb/cnblog/Svet-na-konci-pandemie-pyramida-z-dluhu/

Year-on-year growth in loans to households slowed to 8.7% in Q2 2022, but net new loans continued to rise, except for April. Households' efforts to take out loans before their next expected increase in price probably played a role here. The average client interest rate on new mortgage loans reached 4.3% in June 2022 (up 2.2 p.p. year-on-year). Currently, in September 2022, the rate has reached 5.83%. Growth in loans to non-financial corporations also slowed to 6.7% in Q2. The growth was driven exclusively by foreign currency loans, which can be explained mainly by the high and widening interest rate spread vis-à-vis CZK loans. The average client interest rate on total loans to non-financial corporations increased to 7.0% in June (up 4.4 p.p. year-on-year) (Ministry of Finance of the Czech Republic, online, 2022).

The similarity of the structure of financial liabilities of Czech corporations with those of corporations in euro area countries is relatively high. However, this is not the case for Czech households, where the similarity is still very low (CNB, online, 2021). This is mainly because Czech households prefer to hold cash and deposits in banks, unlike euro area households, which invest more extensively in insurance and pension schemes.

Based on the above analyses and forecasts, a partial conclusion can be made with some certainty: the price stability criterion will not be met in 2022 and will most likely not be met by the end of 2023 either.

3.1.2 Criteria – Public finance, State budget deficit

The general government deficit reached CZK 94.1 billion in Q1 2022, an improvement of CZK 47.7 billion year-on-year. The largest part of the year-on-year decrease was mainly attributable to central government, which ended in a deficit of CZK 102.5 billion, a year-on-year improvement of CZK 53.3 billion. Local government managed a surplus of CZK 5.1 billion and social security funds ended in a surplus of CZK 3.4 billion. In the first quarter of 2022, the general government ended up with a deficit of CZK 94.1 billion, representing 6.1% of GDP. The general government debt ratio fell by 1.1 percentage points year-on-year to 42.8% of GDP. The outturn was significantly affected by an increase on income from taxes on production and imports and a decrease in subsidies paid.

Table 2: General government balance, Q3 2019 – Q1 2022

Period	3.Q 2019	4.Q 2019	1.Q 2020	2.Q 2020	3.Q 2020	4.Q 2020	1.Q 2021	2.Q 2021	3.Q 2021	4.Q 2021	1.Q 2022	2.Q 2022
CZK billion	16,4	-24,1	-47,7	-95,9	-40,7	-133,8	-144	-59,2	-42,7	-105,2	-94,1	0,5
% of GDP	1,1	-1,6	-3,5	-7,1	-2,8	-8,8	-10,4	-3,9	-2,7	-6,5	-6,1	0,0

Source: processed by the authors according to the ČSÚ. [online]. Deficit a dluh vládních institucí – 1. čtvrtletí 2022. 1.7.2022. [Cit. 2022-10-09]. Dostupné z https://www.kurzy.cz/zpravy/660015-deficit-a-dluh-vladnich-instituci-1-ctvrtleti-2022/

The public finance balance of the Czech Republic puts it among the least indebted countries in the EU. It meets both the Maastricht criterion (60% of GDP) and the debt quota level set by the Act on Budgetary Responsibility Rules (55% of GDP net of the cash reserve created by government debt financing). This created the fiscal space necessary for major negative shocks. In addition, the government managed to take advantage of favourable factors on the financial markets, including the positive rating of the Czech Republic's public finances by credit rating agencies.

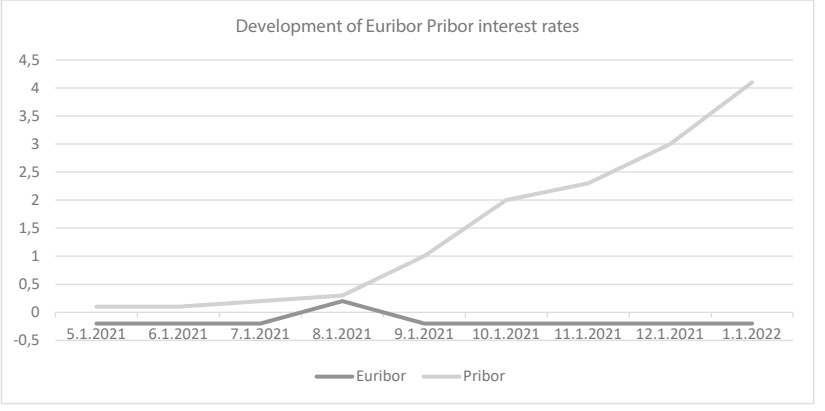
Based on the above analyses and forecasts, a partial conclusion can be drawn: as a result of the pandemic and the expansionary policy of the government in 2021, the government budget deficit as a share of GDP was 5.9%; the 3% criterion is not met. Public debt rose to CZK 2 466 billion in 2021, i.e. 40.8% of GDP. The sustainability of criteria fulfilment is at risk in the future, as the structural deficit shows a significant negative trend. The CNB expects government debt to rise to 46% in 2024; the 60% criterion is being met and, according to forecasts, will likely continue to be met for several years.

3.1.3 Criterion – Long-term interest rates

The criterion is based on an evaluation of government bond prices. From the perspective of the real economy, we also need to look at market rates. The criterion is fulfilled, but the future is uncertain because the rating agencies have set a negative outlook for the Czech Republic (especially with regard to the sustainability of public finances), which will be reflected in the price of government bonds.

Developments on the current financial markets show that the "opening scissors" trend in the interest rate differential between the Czech koruna and major foreign currencies will continue in the first half of 2022. It can be assumed that the financing of corporations in foreign currencies will continue thanks to this trend, especially for those with revenues in euro or other currencies. The following Figure 4 illustrates this statement.

Figure 4: Interest rates CZK vs. Euro



Source: processed by the authors according to the Euribor, ČNB

At the May 2022 monetary policy meeting, the CNB Bank Board raised the two-week repo rate by 0.75 percentage point to 5.75%. At the same time, it decided to increase the discount rate in the same range to 4.75% and the Lombard rate to 6.75%. The Czech economy faces a combination of exceptionally strong and persistent price pressures from abroad and persistent domestic inflationary pressures, which translate into

accelerating and broad-based price growth (CNB, online, 2022). The current significant increase in interest rates according to the CNB's forecasts should change mid-year to a gradual decline in the second half of 2022.

The CNB Bank Board did not raise interest rates at its August meeting. The base rate, the two-week repo rate, currently remains at 7%. According to the new CNB governor, Aleš Michl, the Bank Board will monitor incoming data in the next period and consider whether to raise rates at its following meetings. The board members are generally rather reserved in raising monetary policy rates.

The analysis shows that we currently meet the interest rate convergence criterion, but the outlook is highly uncertain.

3.1.4 Criterion – Exchange rate stability

The Czech Republic has not joined the exchange rate mechanism, so we will base this criterion on real movements in the exchange rate between the Czech koruna and the euro. The convergence of a less developed economy towards the group of original EU countries involves both catching up in terms of economic levels, i.e. real convergence, and convergence in terms of price levels, i.e. nominal convergence.

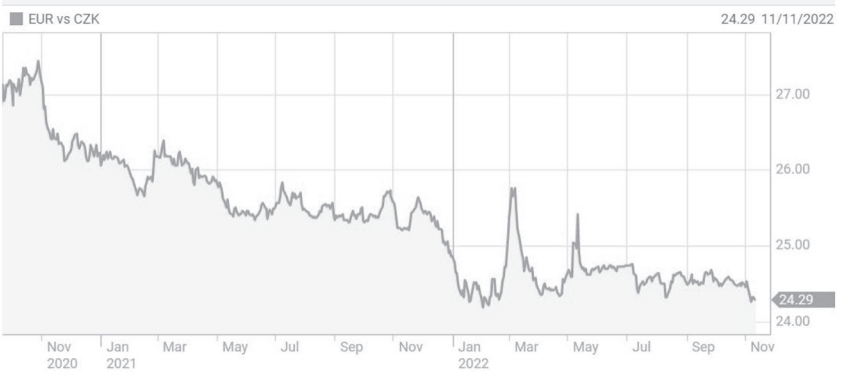
- Real convergence occurs when the converging country's real output per capita approaches the level achieved in the countries it aims to catch up to. From this perspective, real convergence leads to a narrowing of the differences in living standards between the countries being compared and a convergence of the populations' purchasing power.

- Nominal convergence occurs when the price level of the catching economy, expressed in the currency of the target economy, converges faster than that of the target country. This happens in two basic ways – through higher inflation (the inflation differential channel) if the nominal exchange rate of both currencies is stable, or through the appreciation of the nominal exchange rate of the catching country's currency against the target country (the exchange rate channel) in the case of similar inflation in the two countries being compared.

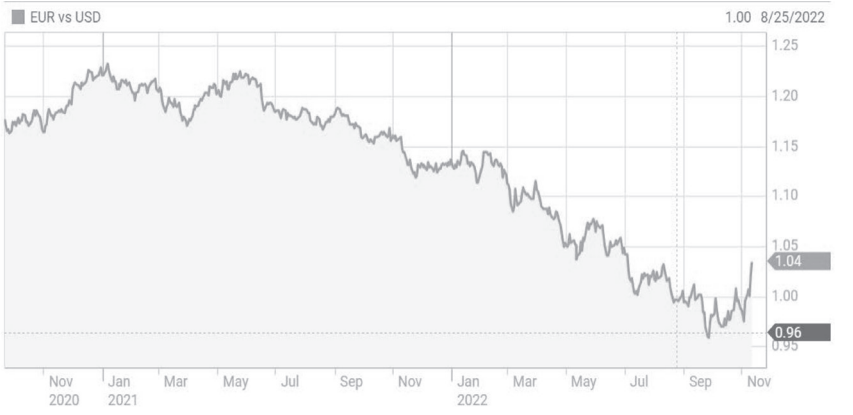
This implies that nominal convergence (an increase in the relative price level) is captured by the appreciation of the real exchange rate.

For the corporate sector, the monitored parameter is the correlation between the Czech koruna and the euro. It is true that there is a very high interdependence, which is confirmed by the development of the exchange rate between the Czech koruna and the euro. As it seen from the following charts, trend correlation between eur and czk is confirmed.

Figure 5: Exchange rates CZK vs. Euro/corelation



Source: Reuters



Source: Reuters

The pandemic year interrupted the appreciation of the real exchange rate of the Czech koruna observed since the exchange rate commitment period.

Table 3: Real exchange rate against the euro on a HICP basis (2010=100; an increase in the index implies an appreciation of the real exchange rate)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	1Q 2022
CZ	102,3	101,0	97,8	92,3	93,2	94,4	97,8	100,6	101,9	100,7	100,8	101,2
DE	101,8	102,9	100,9	101,0	101,0	100,9	102,2	103,0	104,6	103,3	103,5	103,7
PT	101,4	102,0	101,8	101,6	100,8	101,2	103,4	104,2	105,2	104,9	104,7	104,3
HU	99,8	99,3	97,1	93,0	92,5	92,3	93,7	91,9	92,1	86,9	88,2	89,1
PL	98,0	97,7	96,9	96,8	96,0	91,6	94,0	93,4	93,4	92,3	92,6	92,5
SK	99,8	99,4	99,7	100,0	100,5	100,6	100,8	101,0	101,1	100,1	100,5	100,7

Source: processed by the authors according to the Eurostat

According to the CNB's data, the exchange rate of the Czech koruna is expected to strengthen against the euro in response to the steep rise in interest rates and settle around CZK 24 to EUR at the turn of Q1 and Q2 2022. The exchange rate is currently at CZK 24.50 to the euro and the central bank is intervening on the foreign exchange market. Given the above-mentioned opinion of the rating agencies and the fiscal developments, it is difficult to predict whether the koruna will continue to appreciate in the longer term.

From the above, it can be concluded that, in the short term, we would probably meet this criterion if we joined the exchange rate mechanism. In the longer term, it would depend on fiscal reforms and the development of the economy, which has been significantly affected by the energy crisis. At the same time, it is apparent that the motivation of the corporate sector for the Czech Republic to join the euro area is high and will continue to grow in the context of rising interest rates of the Czech koruna.

3.1.5 Evaluation of the analyses of Maastricht criteria fulfilment in the Czech Republic

The ongoing coronavirus pandemic was reflected in fiscal policy, which, thanks to its countercyclical role, helped stabilise the Czech economy. Apart from the positives in terms of stabilising the economic, or more precisely, the business environment, this has led to an increase in the State budget deficit. The 3% Maastricht convergence criterion for the general government deficit has been exceeded. The medium-term budgetary objective for the structural balance of -0.75% of GDP was not met as well. On the positive side, the Maastricht debt criterion has not been exceeded, nor has the debt brake criterion, which states that government debt requires the approval of balanced budgets of all government institutions if it rises above 55% of GDP. This shows that the **Czech Republic fulfilled the State debt-to-GDP ratio criterion and the interest rate criterion as of January 2022**.

The state of the Czech labour market is an important parameter in terms of progress towards meeting the Maastricht criteria. Despite the effects of the pandemic, unemployment is one of the lowest in the European Union, with more vacancies than unemployed persons. Another element monitored is mobility of the workforce, which is also gradually improving, mainly due to the increased proportion of foreign nationals in the population. On the contrary, low motivation to work due to the social policy and the minimum wage remains problematic. The labour market is important in terms of inflationary pressures in each EU Member State; therefore, a high degree of consistency in labour market developments is important in each Member State.

As mentioned above, neither the government finances nor the price stability criteria are met. The last criterion, participation in an exchange rate mechanism, cannot be formally met because the Czech Republic does not participate in the exchange rate mechanism. However, according to the CNB's data and its past simulations, the Czech Republic would meet this criterion. The following table summarises the evaluation of the Maastricht criteria fulfilment.

Table 4: Evaluation of the Maastricht criteria fulfilment

Criterion	Requirement	Situation as of	Findings
Price stability	average annual inflation must not exceed by more than 1.5 percentage points the average annual inflation of the three best performing Member States	July 2022 The average of the 3 EU countries with the lowest inflation (harmonised index) was 6.9 Czech Republic – 16.6, i.e. exceeded by 8.5 p.p.	Not met
Public finances	the share of government debt in GDP must not exceed 60%	Government debt rose to CZK 2 466 billion in 2021, i.e. **40.8%** of GDP. The CNB expects government debt to rise to 46% in 2024.	Met until 2021; CNB forecast predicts it will continue to be met
Government budget deficit	the government deficit share in GDP must be less than 3%	As a result of the pandemic and the government's expansionary policy, the government budget deficit to GDP was 5.9% in 2021.	Not met
Interest rate convergence	the long-term nominal interest rate must not exceed by more than 2 p.p. the average of the three best performing countries in terms of price stability	In the first half of 2022, the scissors between interest rates in the euro area and the Czech Republic are opening.	Met until the end of 2021
Exchange rate stability	the candidate country should join ERM II at least two years before joining the monetary union	We are not participating in the mechanism.	Not evaluated.

Source: processed by the authors according to the Eurostat, ČNB

The June 2022 ECB Convergence Report assesses progress made by seven non-euro area EU Member States as follows:

- As regards **the price stability criterion**, only Croatia and Sweden reported inflation rates below or well below the 4.9% reference value. This benchmark is based on average inflation reported by the top three countries over the last 12 months – Finland, France and Greece (excluding outliers for Malta and Portugal). In the remaining five countries under review – Bulgaria, the Czech Republic, Hungary, Poland and Romania – inflation rates have been well above the reference value over the past 12 months, similar to those in the 2020 Convergence Report.

- As regards **the fiscal criteria**, at the time of publication of this report, only Romania is subject to an excessive deficit procedure (opened in April 2020). Although three other countries under review – Bulgaria, the Czech Republic and Hungary – exceeded the 3% of GDP deficit reference value in 2021, no new EDP procedures have been launched.

- Following a sharp increase in 2020 due to the COVID-19 crisis, **budget deficits** remained elevated in 2021 in all countries except Sweden. Compared to 2020, budget balances improved in 2021 in all countries under review except Bulgaria and the Czech

Republic. According to the European Commission's Spring 2022 Economic Forecast, deficit-to-GDP ratios are expected to decline in most of these countries in 2022 and 2023. However, this indicator is projected to exceed the reference value in the Czech Republic, Hungary, Poland and Romania in 2023.

- **The general government debt-to-GDP ratio was between 20% and 40% in Bulgaria and Sweden and between 40% and 60% in the** Czech Republic, Poland and Romania in 2021, while the debt ratio was above the 60% reference value in Croatia and Hungary. Government debt ratios in four of these countries are expected to decline in 2022 and 2023 owing to both the improvement in economic activity and the winding-up of fiscal measures adopted in response to the COVID-19 pandemic, while budget balances should be burdened by the new measures taken in response to high energy prices and Russia's war with Ukraine.

- As regards the **exchange rate criterion**, the Bulgarian lev and the Croatian kuna were part of ERM II for most of the two-year reference period from 26 May 2020 to 25 May 2022 at mid-parities of 1.95583 lev to euro and 7.53450 kuna to euro. The Croatian kuna's exchange rate showed a low degree of volatility and the currency traded close to its mid-parity. The Bulgarian lev did not deviate from its middle parity. With the exception of the Romanian leu, exchange rates for non-ERM II currencies exhibited a relatively high degree of volatility.

- Looking at **the convergence** of long-term interest rates, the lowest 12-month averages of long-term interest rates were reported in Bulgaria, Croatia and Sweden. The Czech Republic was also below the 2.6% reference value at 2.5%. Two of the countries under review – Hungary and Poland – recorded 12-month averages of long-term interest rates above the reference value, while in Romania the 12-month average of long-term interest rates was well above the reference value.

3.2 Relationships and correlations between actual and perceived inflation after the introduction of the euro

The **perceived inflation** variable falls into the category of psychological variables that have their own specific measurement procedures. There are three basic ways of measuring perceived inflation: Balance sheet statistics, Perceived inflation rate calculated from statistical data and Combined method according to Diaz, Duarte and Rua.

The rate of perceived inflation calculated from statistical data – is the Brachinger's approach, which measures the rate of perceived inflation directly from statistical data, not from consumer survey data. He selected some items from the standard consumer basket and assigned a value of 100% to these items. Subsequent recalculation of the selected items yielded statistical data that were used to calculate perceived inflation. The authors apply this approach in Table 5.

Table 5: Perceived inflation rate calculated on the basis of statistical data for 2019

	Official weight	Recalculated weight to measure of perceived inflation
Food, soft drinks	15,0%	32,5%
Electricity, heat, gas, other energies	9,9%	21,5%
Household maintenance goods and services	1,1%	2,4%
Health	2,3%	5,0%
Operation of means of transport	4,8%	10,5%
Transport services	2,0%	4,4,%
Catering services	4,1%	8,8,%

Source: processed by the authors according to the ČSÚ

Combined – a method according to Diaz, Duarte and Rua, who say that the inflation gap arises when we use balance sheet statistics recalculated from the European Central Bank's consumer surveys to calculate perceived inflation. Using this method, it can be concluded that there was no break in the relationship between actual and perceived inflation after the introduction of the euro. It can be deduced that the conclusions obtained may depend on the method chosen to measure and calculate perceived inflation.

Table 6 below, which is based on balance sheet statistics, presents different data relating to actual and perceived inflation in the euro area, allowing an understanding of how both types of inflation move before and after the introduction of the euro. It is also important to note that the biggest wave of euro adoption into cash circulation occurred in 2002. However, some other EU countries have adopted the euro in subsequent years, such as Slovakia in 2009. Data for the euro area are compared with those for the Czech Republic, Slovakia and Austria for the same period.

Table 6: Relationship between actual and perceived inflation in 1999–2017

Year	Real inflation				Perceived inflation			
	Eurozone	Czech Republic	Austria	Slovakia	Eurozone	Czech Republic	Austria	Slovakia
1999	1,2	1,8	0,5	10,4	14,94	X	11,45	68,23
2000	2,2	3,9	2,0	12,2	29,25	X	14,25	50,05
2001	2,4	4,5	2,3	7,2	27,44	15,50	12,25	35,08
2002	2,3	1,4	1,7	3,5	57,19	3,80	42,55	29,84
2003	2,1	-0,1	1,3	8,4	48,26	16,63	36,00	37,59
2004	2,2	2,6	2,0	7,5	38,62	13,07	35,30	27,36
2005	2,2	1,6	2,1	2,8	36,86	15,11	36,60	21,17
2006	2,2	2,1	1,7	4,3	37,05	17,90	36,80	6,98
2007	2,2	2,9	2,2	1,9	60,44	8,73	65,25	32,41
2008	3,3	6,3	3,2	3,9	44,43	2,68	43,10	24,54
2009	0,3	0,6	0,4	0,9	0,55	34,40	7,35	9,58
2010	1,6	1,2	1,7	0,7	20,04	15,78	28,20	10,79
2011	2,7	2,2	3,6	4,1	36,72	3,52	55,30	37,76
2012	2,5	3,5	2,6	3,7	35,88	11,71	44,45	37,15
2013	1,3	1,4	2,1	1,5	28,74	4,53	34,60	17,02
2014	0,4	0,4	1,5	-0,1	6,43	7,21	20,30	7,76
2015	0,0	0,3	0,8	-0,3	1,60	13,49	14,55	9,71
2016	0,2	0,6	1,0	-0,5	4,62	13,84	18,10	7,38
2017	1,5	2,4	2,2	1,4	13,75	20,01	36,00	24,17

Source: processed by the authors according to the Eurostat (2018)

Table 6 above shows that **perceived inflation is always higher than actual inflation**. This can be demonstrated in the case of the euro area. In this case, even after other countries became part of EMU in the first or next wave of adoption, the levels of actual inflation did not increase at an exorbitant rate. Before the euro went into cash circulation in 2002, inflation was around 2%. After 2002 and until 2007, it remained around 2%. Therefore, the adoption of the euro had no effect on actual inflation in euro area countries, but changes were noticeable in the case of perceived inflation. It was found that consumers perceived inflation to have increased from 27% to 57% in 2002. Thereafter, perceived inflation began to fall again. The year 2002 was a truly exceptional one for perceived inflation in the euro area. This is due to the fact that a large number of countries joined the euro area in 2002, which affected a large number of consumers.

- The relationship between actual and perceived inflation is well illustrated by the example of Austria. Although actual inflation in this country is around 2–3% over the whole reference period, perceived inflation is many times higher, up to 65%.

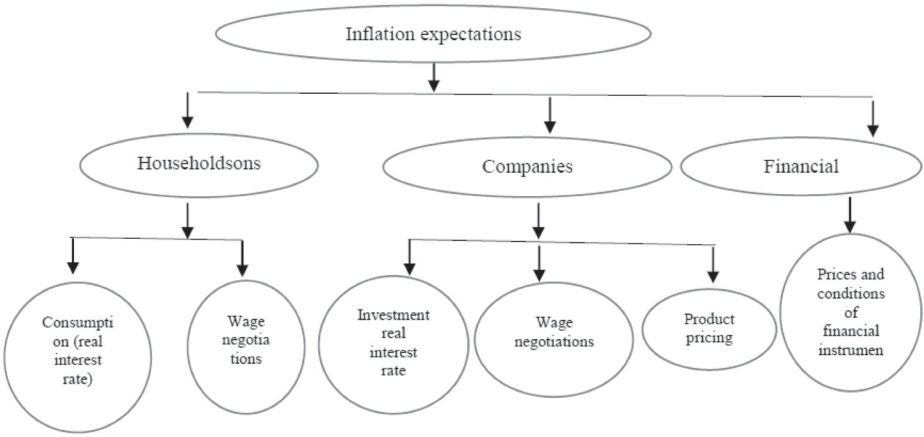
- In the case of Slovakia, perceived inflation stood at -9.58% at the time it joined the euro area. Thus, consumers thought that inflation would fall by almost 10% after the adoption of the euro. By contrast, in Austria, perceived inflation was close to 43% in 2002 after the adoption of the euro. Therefore, Slovakia can be seen as a positive example in this respect, thanks to its communication campaign before the adoption of the euro. This measure can be recommended for the Czech Republic if it decides to join the euro area.

Discussion

Given the current turbulent situation on the financial and economic markets caused by the conflict in Ukraine, the unpredictability of Russia's behaviour and the related effects, especially on the energy and food markets, it rather very difficult to predict when the Czech Republic could meet the Maastricht criteria again due to the large number of variables. As the previous summary shows, the differences between the Czech Republic and other euro area countries are visible despite the shared background and it will depend on the Czech Republic's monetary and fiscal policy whether it will be able to start converging again under these conditions. According to the CNB's forecasts for the inflation rate, interest rates and total debt, a change in the negative trend can be expected after 2024 at the earliest.

Expectations about inflation have a subsequent impact on the difference between actual and perceived inflation. It expresses the expectation of households, business managers and money and capital market participants about the annual percentage change in consumer prices by which the prices of goods and services will change over 12 and 36 months. It has a significant impact on the behaviour and decision-making of households and firms and thus on overall economic development and the resulting real inflation rate. It represents one of the major factors influencing the future development of the price level (Molnár, 2022). How people expect prices to develop in the future affects how they spend, invest or borrow money today. Corporations also take these expectations into account when setting prices for their goods and services (ECB, online, 2021). Based on the topics discussed above, a schematic overview model of the impact of inflation expectations can be proposed.

Figure 6: A schematic overview model of the impact of inflation expectations



Source: processed by the authors

Let us return to the issue of the Czech Republic's entry into the euro area, in which inflation expectations can be anticipated to affect the decision-making of households and corporations. Most of the attention is focused on one-off effects, which are orders of magnitude less important and even marginal in the whole process of adopting the common currency. Paradoxically, however, these have received the most public attention so far, while the more important long-term effects are rather neglected. One-off effects mean estimates of the reactions of traders who will use the introduction of the single currency to round prices upwards only and raise them more than would correspond to a simple arithmetic conversion of CZK prices into euro prices according to a fixed conversion coefficient.

There is truly no need to worry about the extent of these effects. According to the National Plan for the introduction of the euro, there will be a relatively long period of the mandatory dual price marking (everyone will have to mark all prices in both CZK and EUR five months before E-Day and one year after it). Therefore, it will be possible to keep track of how prices in both currencies are evolving. The author sees this measure as a tool to accustom the public to a different numerical expression of prices rather than as a tool to control "dishonest" traders.

It can be assumed that higher perceived inflation will be one of the non-economic costs of joining the euro area. An interesting experience from abroad is that higher perceived euro-related inflation was systematically measured in countries where the public had the least warm attitude towards the euro (Greece) and the most warm (Austria, Finland). Higher perceived inflation was also measured in countries where people switched from large denominations of domestic currency banknotes and coins to smaller euro denominations. They suddenly felt poorer, while prices did not seem that much lower (Italy). Very simply put, the greater the enthusiasm for the euro and the stronger the exchange rate of the domestic currency against the euro before joining the euro area, the smaller the cost in terms of a rise in perceived inflation and the faster its dissipation (Mentlík, 2022).

Conclusion and Recommendations

It remains the case that the Czech Republic has committed itself by the Act of Accession of the Czech Republic to the European Union to take steps to be ready to join the euro area as soon as possible. In April 2007, the Government of the Czech Republic approved the National Plan for the introduction of the euro. Information on the introduction of the euro in the Czech Republic can be found on the portal of the Ministry of Finance of the Czech Republic at https://www.zavedenieura.cz. However, the latest report "Government accepts MoF and CNB recommendation not to set a target date for euro adoption yet" is dated 7 December 2020. The Ministry of Finance continuously prepares the Macroeconomic Forecast of the Czech Republic; the latest data were published in August 2022. On 6 January 2022, the Government of Petr Fiala approved the final version of the Policy Statement of the Government of the Czech Republic. In this statement, the government, among other things, committed itself to meeting the Maastricht criteria, in the context of the general proclamation to stabilise public finances. However, a commitment that the Czech Republic will move towards adopting the euro is still missing (Just, online, 2022).

According to the Convergence Programme of the Czech Republic of April 2022, the government aims to take a more ambitious approach to reducing public finance deficits than as set by the statutory limits. The strengthening of the Czech economy dynamics should also be facilitated by funds from the European Union, such as from the ending 2014–2020 financial period, the new financial period or the NextGenerationEU instrument. However, the current geopolitical situation brings with it changes in economic policy priorities and settings, the financial side of which will be reflected in the structure of the economy. Taking into account the current legal framework, public finances can be expected to again meet the Stability and Growth Pact criterion for the general government deficit in 2024 (Ministry of Finance, 2022). However, the draft budget for 2023 and the medium-term budgetary outlook do not support this intention.

The Eurogroup has discussed the fiscal policy guidelines for 2023. It concluded that supporting aggregate demand through fiscal policies in 2023 is not justified and that the focus should instead be on protecting the most vulnerable groups, while continuing to react quickly and adapt as appropriate. Fiscal policies in all countries should aim to maintain debt sustainability and raise growth potential in a sustainable way to support the recovery. Although the current global context presents significant challenges, the Eurogroup has full confidence in the resilience of the euro area economies and remains fully committed to ensuring the conditions for high sustainable growth in the EU countries (consillium.europa.eu, online, 2022).

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