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MACROECONOMIC IMPACTS OF THE COVID-19 PANDEMIC IN THE CZECH REPUBLIC IN THE PERIOD OF 2020-2021

ADÉLA ZUBÍKOVÁ, PAVEL SMOLÁK

Abstract:

This article provides a comprehensive summary of selected macroeconomic impacts of the COVID-19 pandemic in the Czech Republic, including an assessment of certain implemented fiscal and monetary policies, using data from 2019 (to compare the development of the economic situation during the COVID-19 pandemic with the period before the onset of the pandemic), 2020 and 2021 on a monthly or quarterly basis. Particular attention is paid to monetary policy effects, which, unlike fiscal policy, the Mundell-Fleming model considers effective in a small open economy with a freely floating exchange rate. The article also investigates the volume of fiscal measures taken to mitigate COVID-19 pandemic effects, the restrictive measures introduced to Czech households and firms as well as labour market developments during the period of 2019-2021, including quantification of the aggregate labour productivity index. The conclusions of the article are that, during the COVID-19 pandemic, macroeconomic indicators in the Czech Republic acted in accordance with the established partial hypotheses of the Mundell-Fleming model and in accordance with the hypothesis of the modified Phillips curve. Possible causes of the significant increase in inflation since September 2021 include 2020 nominal public and private sector salary growth, which showed faster growth than aggregate labour productivity, and the highly expansionary fiscal policy that characterized the 2021 pre-election period.

Keywords:

macroeconomic policy, monetary policy, aggregate labor productivity, labour market data, public expenditure, Phillips Curve, crisis management, Czech Republic, COVID-19 pandemic, Mundell-Fleming model

JEL Classification: E52, J01, H50

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Introduction

The global crisis associated with the spread of the viral disease SARS-CoV-2 causing COVID-19, publicly known as the "coronavirus", has significantly affected the lives of billions of people. The origin, spread, course and mutation of the disease have become a common conversation topic of more than just scientific communities around the world. Scientists from multiple disciplines have begun to refocus their research towards topics related to the COVID-19 pandemic. A significant number of articles that address strategically important topics have begun to emerge, such as the impact of the disease on health systems (Blumenthal et al., 2020), as well as indirectly related topics, such as the impact of the COVID-19 pandemic on gender inequality (Fortier, 2020).

Significantly less attention has been paid to the examination of the Czech Republic in the political and economic context. The articles published so far on this topic are based mainly on data from 2020. The aim of this article is to provide a comprehensive summary of the macroeconomic impact of the COVID-19 pandemic in the Czech Republic, including an evaluation of the political measures that were implemented. The summation of macroeconomic impacts and effects of selected fiscal or monetary policies will be approached by primarily using empirical data from 2019 (to compare the development of the economic situation during the COVID-19 pandemic with the period before the onset of the pandemic), 2020 and 2021 on a monthly or quarterly basis, in accordance with the selected index. A longer period of time must pass before the long-term macroeconomic impacts can be examined and therefore this article aims to highlight only selected short-term impacts of this pandemic on the national economy.

The structure of the article is as follows: Chapter 1 presents the key economic theory on which the research in this article is based and provides an overview of existing research into the impacts of the COVID-19 pandemic in the Czech Republic. Chapter 2 presents the results of the research. Initially, we briefly introduce how the COVID-19 pandemic developed in the Czech Republic and its impact on the Czech economy, then we subsequently focus on the ecopolitical measures taken. The main economic policy examined is monetary policy, which, according to the Mundell-Fleming model, is more effective than fiscal policy in a small open economy. The main monetary policy instrument examined is the changes to the key two-week repo rate announced by the Czech National Bank, with particular focus on 2020 and 2021. Three partial hypotheses are derived from the aforementioned Mundell-Fleming model, and they are described in detail in Section 2.2 of the work. The first of these partial hypotheses is the claim that the initial increase in the two-week repo rate is accompanied by an increased inflow of capital from abroad, while its subsequent decrease is accompanied by an increased outflow of capital abroad. The second of these partial hypotheses is that an increased inflow of capital into the domestic economy is followed by an appreciation of the nominal exchange rate, while an increased outflow of capital abroad is followed by a depreciation of the nominal exchange rate. The last of these partial hypotheses is the claim that the appreciation of the nominal exchange rate is accompanied by a decline in net exports of goods and services, while the depreciation of the nominal exchange rate is accompanied by a corresponding increase.

The fourth partial hypothesis of this research reflects the modified Phillips curve, according to which there is an inverse correlation between the inflation rate and the actual unemployment rate. This article therefore briefly looks at the amount of fiscal impulse adopted by the Government of the Czech Republic to mitigate the negative impacts of the COVID-19 pandemic on Czech entities (households and companies). In the last section, we focus on a more detailed analysis of the impact of the COVID-19 pandemic on the labour market in the Czech Republic

using several indicators (median salaries in the public and private sectors, monthly number of hours worked and unworked, aggregate labour productivity, and real and nominal wages).

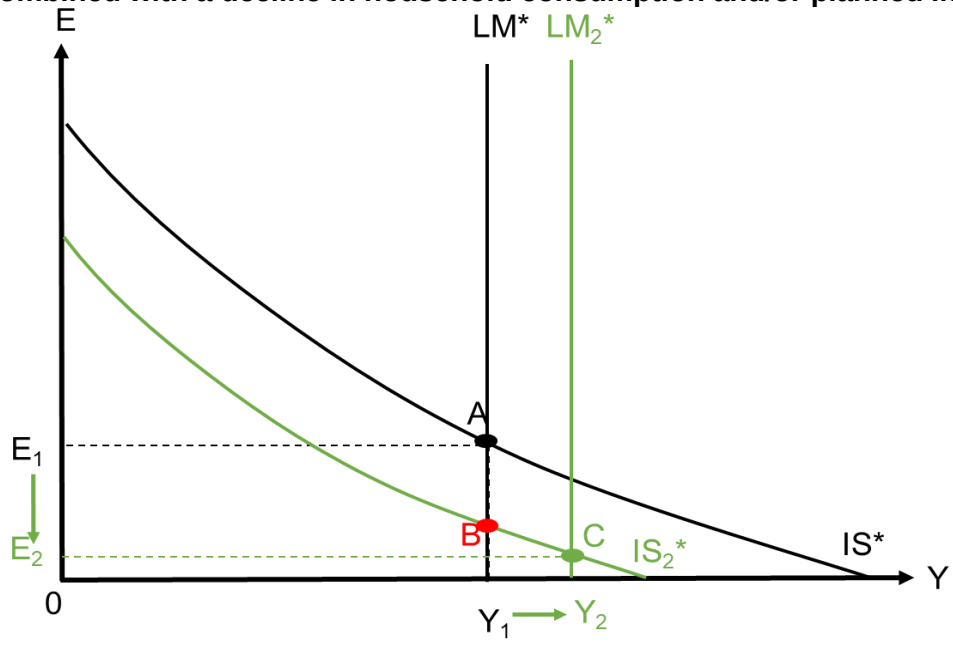
1 Literature review

The main areas of research examined include the introduction of budgetary policies primarily in response to prior restrictive measures aimed at reducing the rate of spread of COVID-19 infection, changes in the main rates of the Czech National Bank as well as salary and labour productivity developments observed throughout the course of the pandemic in the Czech Republic. From a theoretical perspective, all of these areas are described primarily at the macroeconomic level of aggregate demand theory. At present, the most respected mainstream macroeconomic theories describing the short-term development of aggregate demand relating to a small open economy, such as the Czech Republic, include the Mundell-Fleming model and the Phillips curve. We therefore consider it necessary to briefly present these economic theories.

1.1 The Mundell-Fleming model in relation to goods and services market and money market balance in a small open economy

The Mundell-Fleming model is a theoretical model of short-term economic fluctuations independently developed by Robert Mundell (1963) and Marcus Fleming (1962). The model describes the reality in the market of goods and services and in the money market of small open economies in the short term. The theory of the Mundell-Fleming model is of importance to our research, especially as it is used for assessing the impact of changes in the main rates of the Czech National Bank on changes in the development of domestic exports. The partial conclusions of the Mundell-Fleming model related to short term expansionary monetary policy, assuming a decrease in household consumption and/or a decrease in producers' planned investment caused by the introduction of restrictive measures or a pandemic, can be graphically illustrated by the following:

Figure 1 Expansionary monetary policy in the form of interest rate reductions combined with a decline in household consumption and/or planned investment



Source: Mankiw (2006), own construction.

The vertical *E-axis* here denotes the exchange rate (expressed as direct quotation - with the appreciation of the domestic currency occurring upwards along the axis, and depreciation downward), the horizontal *Y* axis denotes the real domestic product, and the decreasing curves *IS** denote all possible combinations of the exchange rate and domestic product, in which the market of goods and services are balanced and the vertical line *LM** denotes all possible combinations of exchange rate and domestic product in which the money market is in equilibrium. All is applicable only for the short term and for small open economies, such as that of the Czech Republic.

If the CNB's main interest rates are lowered, as is further examined in Section 2.2., then the fall of the domestic interest rate below the level of the world interest rate will motivate outflow of investor capital from a small open economy to abroad. Capital outflows abroad will increase the short term supply of domestic currency causing domestic currency supply to exceed demand. This surplus will cause a depreciation of the nominal exchange rate and, consequently, of the real exchange rate. Exchange rate depreciation will lead to a relative reduction in the price of domestic goods and services compared to foreign goods, making these goods and services more competitive. Increasing the competitiveness of domestic goods and services will in turn lead to an increase in net exports of the domestic economy. The new equilibrium in the goods and services market as well as in the money market is graphically expressed by point C. The graph demonstrates that, according to the Mundell-Fleming model, expansionary monetary policy leads to an increase in net exports in the short term. This entire transmission mechanism is only applicable to a small open economy with a freely fluctuating exchange rate regime, such as that used by the CNB. Conversely, a restrictive monetary policy which raises interest rates under the same other conditions will, according to the Mundell-Fleming model, lead to a decline in net exports of goods and services through a similar transmission mechanism.

The first hypothesis arising from this theoretical foundation is the assertion that changes in the CNB's two-week repo rates will affect cross-border capital movements, i.e., that their increase will be accompanied by increased capital inflows into the domestic economy, while their reduction will be accompanied by a decrease. The second hypothesis is that the inflow of capital into the Czech Republic will be followed by an appreciation of the nominal exchange rate, while its outflow will be followed by its depreciation. The third hypothesis is that the appreciation of the nominal exchange rate will be accompanied by a decline in net exports of goods and services abroad, while a depreciation will be followed by an increase.

As the graph shows, in a small open economy with a freely floating exchange rate regime, the monetary policy of the central bank can influence real economic variables such as cross-border capital movements or exports and imports of goods and services. In contrast, fiscal policy in the form of changes in government spending or the level of taxation affecting the movement of the *IS** curve appears to be ineffective from the perspective of influencing real economic variables. Given the complexity of the issue of fiscal policy in a small open economy in the short term, only monetary policy will be examined in the empirical part of this article, in accordance with the theoretical basis of the Mundell-Fleming model.

1.2 Phillips curve

Other macroeconomic indicators examined here include developments in salary growth rate, the inflation rate, and the unemployment rate. One of the most important theoretical and empirical analysis approaches dealing with the relationship between these mentioned macroeconomic variables is the Phillips curve. The relationship between the growth rate of annual nominal wages and annual changes in the unemployment rate was examined by Phillips (1958), after whom the curve is named, using data from Great Britain between 1861–1957.

From this data, Phillips concluded that the annual growth rate of nominal wages is negatively correlated with changes in the unemployment rate. The decreasing *PC* curve (The Phillips curve) illustrates the inversely proportional relationship between the annual rate of nominal wage growth and the unemployment rate.

The Phillips curve was further expanded by Samuelson and Solow (1960). Using data from the United States of America covering the period from the end of World War II to 1960, they related the monthly rate of price growth to the real rate of unemployment instead of the original rate of nominal wage growth. They confirmed the inverse relationship between the two macroeconomic indicators based on this data. However, the authors stressed that their work only demonstrated that a "trade off" in the relationship between the inflation rate and the unemployment rate occurs within a short-term horizon (Samuelson, Solow, 1960).

To confirm or refute the Phillips curve in the observed time and place, we hypothesize that in the period under review, any increase in the real unemployment rate will be accompanied by a decrease in the inflation rate or vice versa.

1.3 Current research on the impacts of the COVID-19 pandemic and implemented economic policies in the Czech Republic

Several studies have been written worldwide on the macroeconomic impact of the COVID-19 pandemic and the impact of individually adopted economic policies. However, very few articles with studies focusing on the Czech Republic in the macroeconomic and economic-political context have been published so far. Those that have only use data from the beginning of the COVID-19 pandemic (e.g. Morda and Sima, 2020; Kapicka, Kejak, Slavik, 2020).

Sevcik, Zubikova and Smolak (2020), provided a comparison of the Czech and Slovak Republics, to examine the significance of the role of their domestic currency in times of crisis, using the COVID-19 pandemic as an example. They confirm that the Czech Republic benefited from having its own currency during the COVID-19 pandemic. The supporting arguments of the author's conclusion mention factors including (among others) the mitigation of the negative impact of the external shock on foreign trade, which benefited from the depreciation of the CZK, and the autonomous monetary policy, which enabled the implementation of monetary impulses in the form of interest rate reductions announced by the Czech National Bank.

Löblova, Rone and Borbath (2021) compared the policies adopted in response to the COVID-19 pandemic in the Czech Republic, Bulgaria, and Hungary. They found similarities in the approach to the COVID-19 pandemic across these countries. At the beginning of the pandemic, these countries all acted responsibly and set an example for the rest of the EU. However, they describe economic and political decision-making over the later course of the COVID-19 pandemic as opaque, random, and too generalized. In the case of the Czech Republic, the questioning of government decisions by the parliamentary opposition, the judicial system and civil society were evaluated positively. However, the government of the Czech Republic rarely provided detailed scientific justification for its policies, which reduced the transparency of the entire decision-making system during the handling of the COVID-19 pandemic. The same conclusion was reached by Klimovsky, Nemec and Bouckaert (2021). Nemec, Maly and Chubarova (2020) also focused on evaluating the measures taken, comparing the Czech Republic, Russia and the Slovak Republic. The selected countries chose measures of similar scope and scale, but the timing of these measures differed. The authors concluded that the time profile of measure implementation was a key determinant of the success of the fight against the COVID-19 pandemic.

Jurajda, Dolezelova and Zapletalova (2021) examined the structure of the use of the Antivirus B program by Czech companies in the second quarter of 2020, i.e., during the first wave of the COVID-19 pandemic. They concluded that coverage of the slump in working time caused by the pandemic was low in selected sectors. They also revealed the disproportionately large use of the Antivirus B program by large companies in the manufacturing industry.

In his article, Guasti (2020) focused on assessing the resilience of democratic systems during the COVID-19 pandemic within Central and Eastern Europe. He concluded that the Czech and Slovak Republics had proved resilient in this sense.

Other articles have already dealt with the impacts on specific parts of the Czech economy, e.g., Novotny and Pellesova (2021) examined the impacts on tourism regulation in the Czech Republic, Novy and Novakova (2022) focused on the impact of the COVID-19 pandemic on construction companies in the Czech Republic, and Spacek, Jahoda and Maly (2021) analyzed the measures taken by the Czech government to compensate families with children affected by the COVID-19 pandemic. Placek, Spacek and Ochrana (2021) focused on an evaluation of decision-making at the municipal level.

Sevcik et al. (2020) presented economic policy recommendations to mitigate the negative economic effects of the pandemic in the Czech Republic. Without appropriate actions, the pandemic could lead to a long-term recession in the domestic economy. In summary of these recommendations, the authors emphasized important role of the supply side, which remained significantly neglected during the period of the outbreak of the COVID-19 pandemic in Czech Republic. The actions on the other hand were solely aimed at stimulating the demand side. The authors considered the possible reduction of income taxes to be the basic tool for stimulating the supply side of the economy. This economic-political recommendation was subsequently (in 2021) applied. (609/2020 Coll. In amount 246).

Lestari et al. (2020) dealt with the development of international trade in the period of COVID-19 pandemic in connection with the (non) functioning of the digital economy. The authors concluded that the strengthening of the digital economy resulting from the COVID-19 pandemic has increased the profits of digital service providers. At the same time, it has brought benefits to the end consumers of these digital products. According to the authors, the digital economy also played a key role in stabilizing international trade during the COVID-19 pandemic.

Manko and Rosinski (2021) aimed their research at the new phenomena of “work from home” and its management during the COVID-19 pandemic. Their study shows an overview of the factors that influence the transition from in-person employment and entrepreneurship to remote work. The authors also evaluate the effects of the transition to a distance way of work on labour productivity, employee morale and management workload. The authors conclude that while in some industries, labour productivity is rising due to the transition to a remote work, in others its declining.

Kaderabkova and Jasova (2021) evaluated the policy measures implemented during the first wave of the COVID-19 pandemic in the Czech Republic. The authors concluded that along with the escalation of the COVID-19 pandemic, there was also a decline in economic performance in the Czech Republic. At the same time, the authors criticized the lack of a timely and more vigorous prevention of the spread of the pandemic.

Hromada (2021) in his research dealt with the development of the real estate market in the Czech Republic in the context of the COVID-19 pandemic. Hromada showed through statistical analysis that during the COVID-19 pandemic, standard economic manifestations in the real estate market were disrupted. This disruption includes, for example, the suspension of real estate agents' services or a significant reduction in activity in the real estate market. Hromada

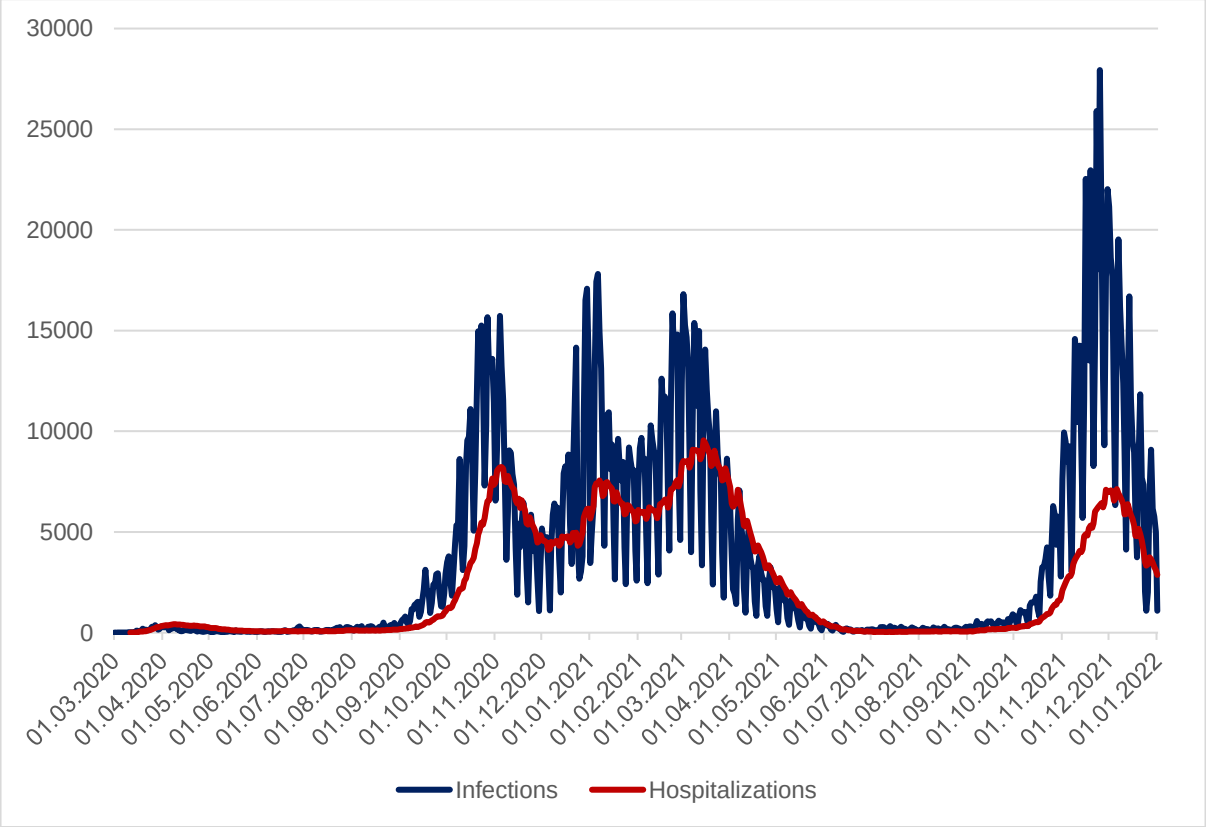
also criticised the articles published in the daily press, which were often based on irrelevant data, which may have led to erroneous strategic decision-making by especially household investors. According to the author, changes in the behavioural patterns of households, investors, and real estate service providers in the period of the COVID-19 pandemic may significantly affect property prices.

The field of the influence of the Czech National Bank's monetary policies on the Czech labor market, which our paper also research marginally, has already been analyzed in the past by the authors Cermakova et al. (2021). In their study focused on the Czech Republic, they mainly researched short-term exchange rate interventions of the Czech National Bank. The authors concluded that the researched expansionary monetary policy led to an increase in the number of vacancies in the Czech Republic. However, according to the authors, this fact subsequently led to a significant excess of the natural unemployment rate over the real unemployment rate and to an accelerating growth of wages in the domestic economy.

2 Results

COVID-19 was first confirmed in the Czech Republic at the beginning of March 2020. The subsequent development of the COVID-19 epidemic in the Czech Republic is shown in the following graph:

Figure 3 Daily overview of the number of infections and hospitalizations in connection with COVID-19



Source: MZCR (2022), own construction.

In the initial period of the outbreak of the disease in the Czech Republic, from the beginning of March until October 2020, the spread of COVID-19 was relatively mild in comparison with most

other European Union countries. Figure 3 shows that there were 4 main "waves" of COVID-19 infection in the Czech Republic. The first wave peaked during October and November 2020, the second during December and January 2021, the third in February 2021 and the fourth, the most intense to date, in November 2021. As one of the most significant risks of the COVID-19 epidemic is exceeding hospital capacity, this graph also captures the development of the total number (not incremental or cumulative) of people hospitalized with the COVID-19 infection at a given date. We can see that over time the trend of the number of people hospitalized follows that of daily increases in number of people infected, usually with a delay of around one to two weeks. During the last wave, in which the number of infected people was significantly higher than the previous three waves, the number of people hospitalized as a proportion of the daily number of infections decreased significantly. Except for the initial outbreak period of March 2020 to September 2020, the pandemic in the Czech Republic ran its mildest course from June 2021 to October 2021. On the other hand, the highest incidences of infection occurred between October 2020 and March 2021 (in this relatively short period of time, 3 waves of the pandemic occurred in the Czech Republic) and in the period from November 2021 until the end of the year.

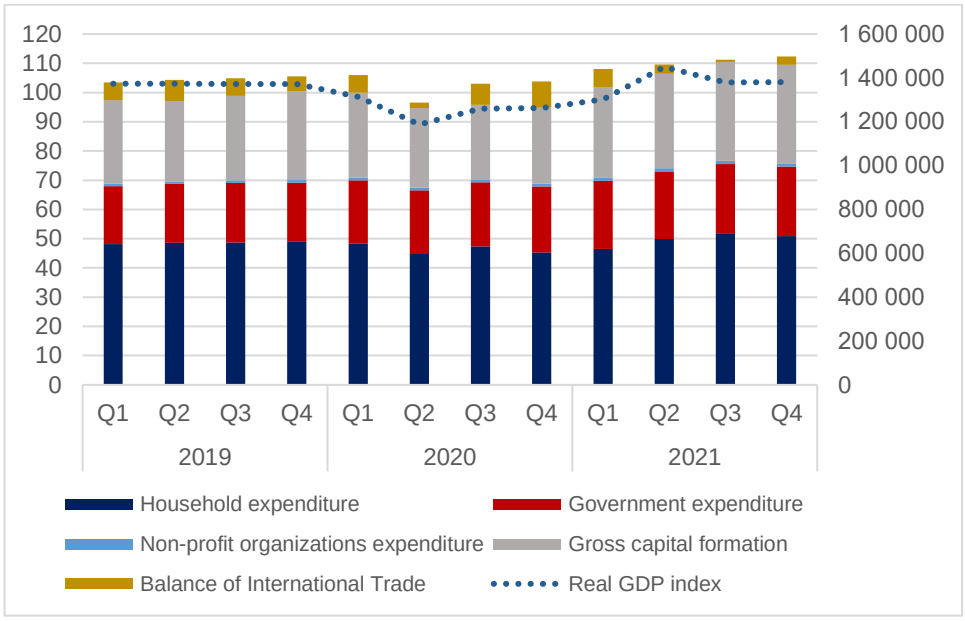
2.1 Impact of the COVID-19 pandemic on the Czech economy

Even though the COVID-19 pandemic in Czech Republic did not begin until March, it already started affecting the Czech economy in the first quarter of 2020 (see Figure 3). In the prior quarter, the Czech economy grew by 2.88% compared to the same quarter of the previous year. In the first quarter of 2020, the Czech economy showed its first contraction after a long period of prosperity, by 1.48% again compared to the same quarter of the previous year. The most dramatic decline in GDP occurred in the second quarter of 2020, when the Czech economy contracted by 10.95% year-on-year. There was a continued year-on-year decrease until the first quarter of 2021. Since the second quarter of 2021, the Czech economy has shown year-on-year growth, but this is due to the comparison with the low baseline of 2020.

The dramatic decline in the Czech economy in 2020 was due to a fall in household consumption and fixed capital formation. Household consumption fell by 7.9% year-on-year in the second quarter of 2020, by 2.7% in the third quarter and again by 7.3% in the fourth quarter. Household consumption partly decreased due to the introduction of lockdowns, where many retail outlets and restaurants were closed (retail stores were closed with some exceptions from 14 March 2020 until 11 May 2020, restaurant operations were suspended from 14 March 2020 until 25 May 2020), as well as partly due to pessimistic consumer expectations. In the case of some households, the reason was also a decrease in income associated with the temporary closure of some businesses, the requirement to stay at home or quarantine due to COVID-19, or the need to take care of a family member affected by COVID-19. An even more pronounced decline was observed in fixed capital formation in the second half of 2020. Fixed capital formation fell by 11.5% year-on-year in the third quarter of 2020 and by 14.8% in the fourth quarter. In 2021, as with household consumption, growth was already returning, but again this was partly due to a comparison with the low baseline of 2020. The decline in GDP was offset by the growth in government spending, which grew by an average of around 8% compared to the corresponding quarters of the previous year.

In the second and third quarters of 2021, the epidemic situation gradually improved, and governmental anti-epidemic measures, which limited activities in the areas of trade and services, were reduced. However, by 2021, (not only) the Czech economy began to be hampered by a shortage of components in industrial sectors, especially components needed for the production of motor vehicles, which greatly affected the Czech automotive industry in the summer months (CZSO, 2021a, 2021b).

Figure 4 Development of real GDP and GDP creation at constant prices (mil. CZK, seasonally adjusted)



Source: CZSO (2022), own construction. Note: the real GDP index is compared with the same period of the previous year (left axis), individual items of GDP creation are on the right axis of the graph.

2.2 Monetary policy measures and their implications

In the Literature Review chapter, we presented the theoretical basis of the Mundell-Fleming model and the transmission mechanism of the influence of monetary policy on the development of net exports that is derived from it. As over half (56.78% (CZSO, 2022b, own calculations)) of foreign trade in the domestic economy during the monitored period of the COVID-19 pandemic consisted of trade with Eurozone countries, this section examines the validity of the selected hypotheses for foreign trade between the Czech Republic and Eurozone countries.

The Czech National Bank (hereinafter referred to as "*CNB*") sets three different monetary policy rates, the two-week repo rate, the discount rate and the Lombard rate. The CNB's key interest rate is the two-week repo rate, which determines the highest possible rate of interest that commercial banks may collect for the CNB's borrowed liquidity in exchange for securities lent. The basic period for which commercial banks hold borrowed liquidity in exchange for borrowed securities is 14 days (hence the "two-week repo rate"). The entire mechanism which affects short-term interest rates happens as part of the withdrawal of excess liquidity from commercial banks, as it is in surplus within the Czech economy (CNB, 2022a).

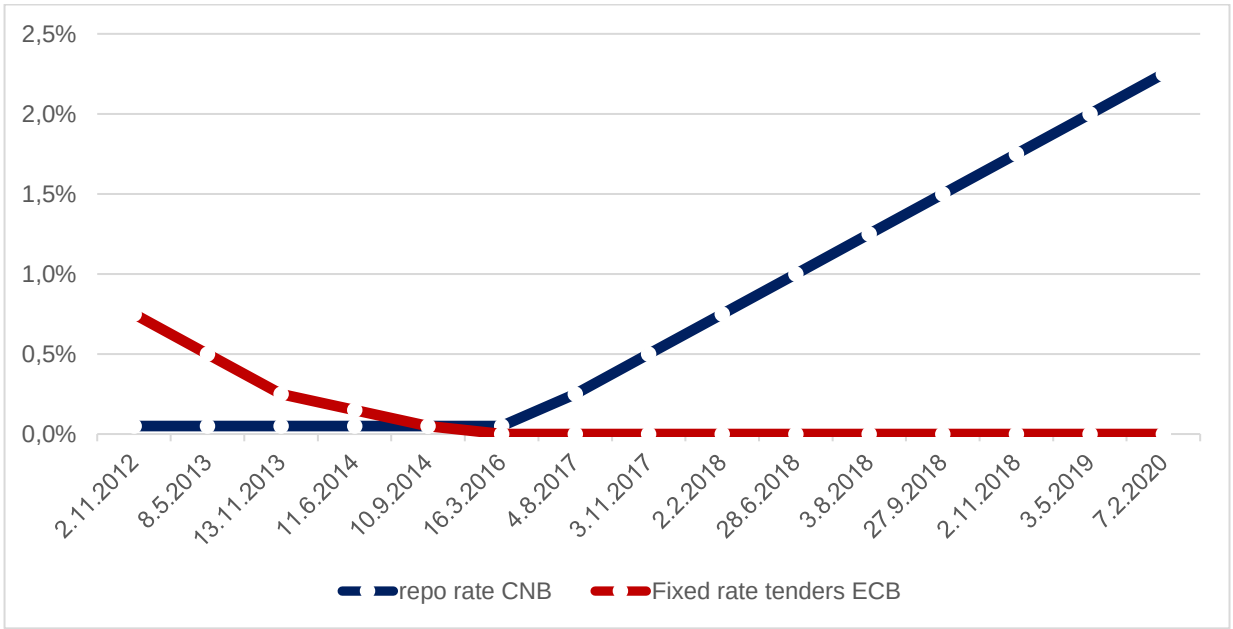
From the European Central Bank (ECB) perspective, the closest equivalent of the CNB's two-week repo rate is "The main refinancing operations (MRO) rate", which European commercial banks pay to the ECB when they borrow liquidity from it for a period of one week in exchange for a guarantee in the form of securities (ECB, 2018)." This interest rate is set by the ECB in advance, and commercial banks offer the amount of money they intend to trade with (Banka Slovenije, 2022).

In the period following the global economic recession that affected the Czech economy until 2012 the CNB maintained a record low level of the two-week repo rate of 0.05% for a considerable length of time. The setting of the two-week repo rate at its current historical low

from 2.11.2012 to 4.8.2017 was justified by the CNB's efforts to prevent impending deflation and by attempts to maintain its inflation target of 2% (+/- 1%), while also contributing to the revival of the economy. From August 2017, the CNB increased the repo rate at a gradual pace, mainly due to the risk of overheating of the economy. The CNB increased the repo rate in small, gradual increments of only a few percentage points, until 7 February 2020, when the repo rate increased to 2.25% (CNB, 2022b).

The ECB also responded to the major recession triggered in 2008 by gradually lowering the MRO, by pushing the rate down to its then minimum (1%) at the end of 2011. As most Eurozone and the European Union countries dealt with the global economic crisis earlier than the domestic economy, the ECB already began to raise its main interest rate for refinancing operations (MRO) again in April 2011, approximately one year and 7 months before the CNB started to raise the level of its repo rate. Unlike the CNB however, the ECB did not raise its key rate for very long time – its last increase occurred in July 2011 (to 1.50%) and from November of the same year the ECB then began to gradually reduce its main interest rate again. In March 2016 the ECB lowered its main interest rate to 0%. The ECB's expansionary monetary policy during this period was conducted in line with emerging trends in unconventional monetary policies, which are linked to extreme monetary policy easing, and to which some of the world's largest central banks resorted to during this period. As can be seen in Figure 5, between 2012 and 2014 the ECB's main interest rate was higher than the CNB's repo rate, while since 2016 the CNB's repo rate has been higher than the ECB's main interest rate (ECB, 2022).

Figure 5 Comparison of the CNB's two-week repo rate and the MRO rate in the period before the outbreak of COVID-19 in the Czech Republic

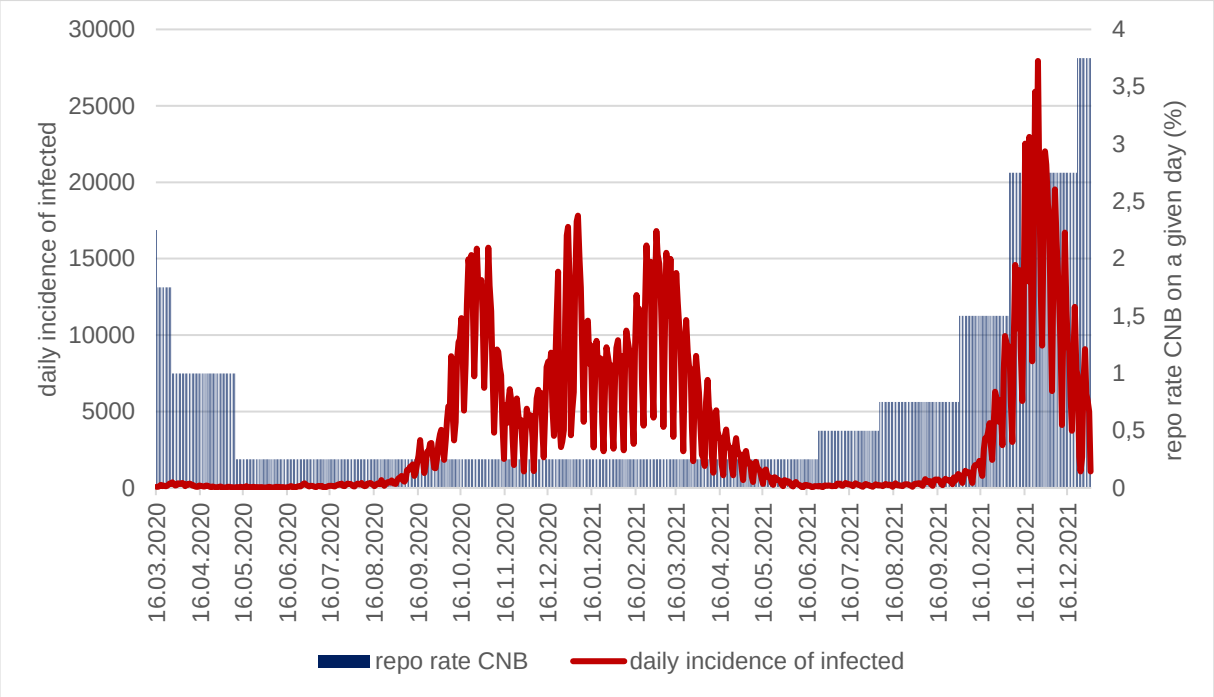


Source: CNB (2022b), ECB (2022), own construction. Note: interest rate levels in percentages per annum.

In March 2020, during the period when the COVID-19 epidemic first reached the Czech Republic, the CNB began to reduce its two-week repo rate again. The CNB gradually lowered this rate to 0.25% (11.5.2020), the level at which the CNB held it throughout the course of the first three main coronavirus waves in the Czech Republic until June 2021. The CNB started to gradually increase the repo rate again after inflation exceeded the tolerance band of the CNB's

inflation target in April 2021 and reached 3.1% (CZSO, 2022c). The ECB did not change its main interest rate during the coronavirus pandemic and kept it at 0% throughout (ECB, 2022).

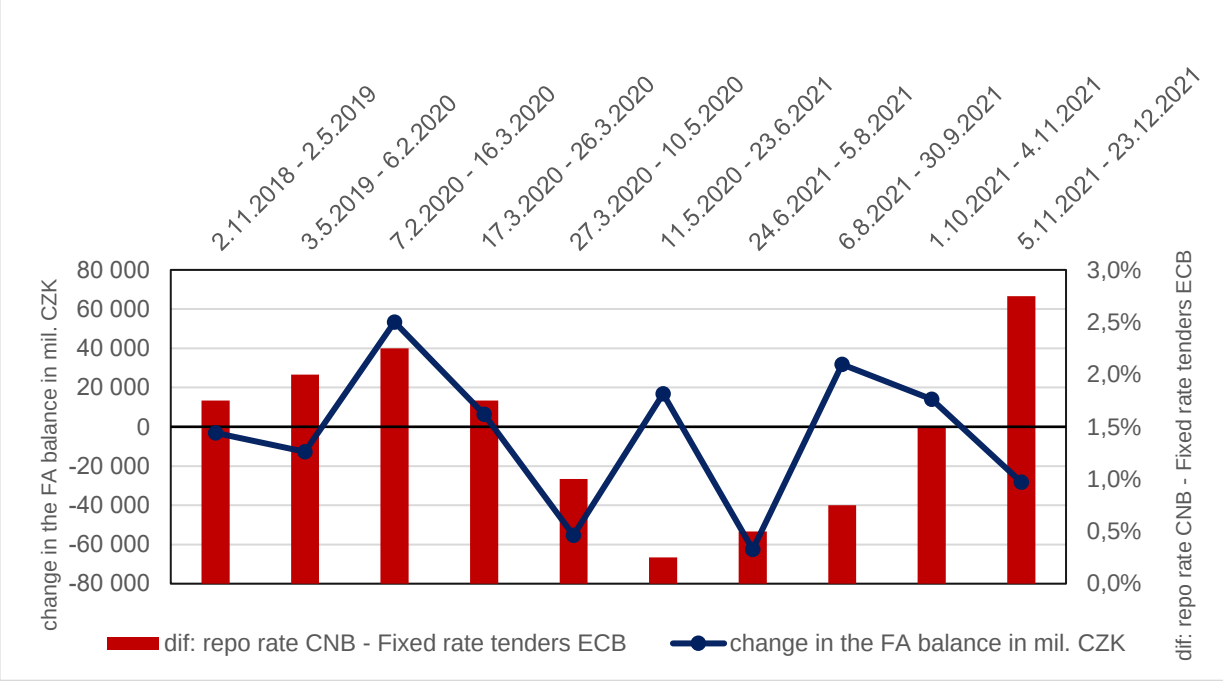
Figure 6 Comparison of the development of the CNB's repo rate against the development of the daily increase in people infected with COVID-19 during the period from 16.3.2020 to the end of 2021



Source: CNB (2022b), Ministry of Health of the Czech Republic (2022), own construction. Note: The daily increases of people infected in the Czech Republic is displayed on the left axis of the graph, the repo rate on a given day is displayed on the right axis of the graph.

Section 1.1. outlines that, according to the theoretical basis of the Mundell-Fleming model, an increase of the world interest rate to a higher level than the domestic interest rate of a small open economy should lead to capital outflows from the small open economy abroad, while an increase of the domestic interest rate of the small open economy to above the world interest rate should lead to capital inflows into the small open economy. As stated at the beginning of this chapter, given the fact that trade with Eurozone countries accounts for more than two-thirds of the total volume of foreign trade of the Czech economy, in our article the world interest rate will be illustrated by the ECB's main interest rate for refinancing operations (MRO). Capital inflows and outflows to/from the territory of the Czech Republic are best captured by the Czech Republic financial account of the balance of payments. Figure 7 therefore compares the difference between the CNB's repo rate and the ECB's main interest rate with changes in the financial account balance of the Czech Republic to the previous period. In order to cover all individual changes to the difference between the CNB's repo rate and the ECB's main interest rate, the periods are based on the dates when the CNB changed its repo rate. The ECB did not change its main interest rate throughout the period under review but kept it at 0%. The financial account of the balance of payments in each specific period is given by the average of the financial account balances for each individual month of that period. The change in financial account balance is determined by the difference between the size of this balance in each given period and the size of this balance in the previous period.

Figure 7 Comparison of the development of the CNB's repo-rate differential with the ECB's main interest rate with changes in financial account balances compared to the previous period during 2.11.2018 to 23.12.2021



Source: CNB (2022b), CNB (2022c), ECB (2022) own calculations, own construction. Note: changes in financial account balances compared to the previous period in millions of CZK are displayed on the left axis of the chart, the differential between the CNB's two-week repo rate and the ECB's main interest rate is displayed on the right axis of the chart.

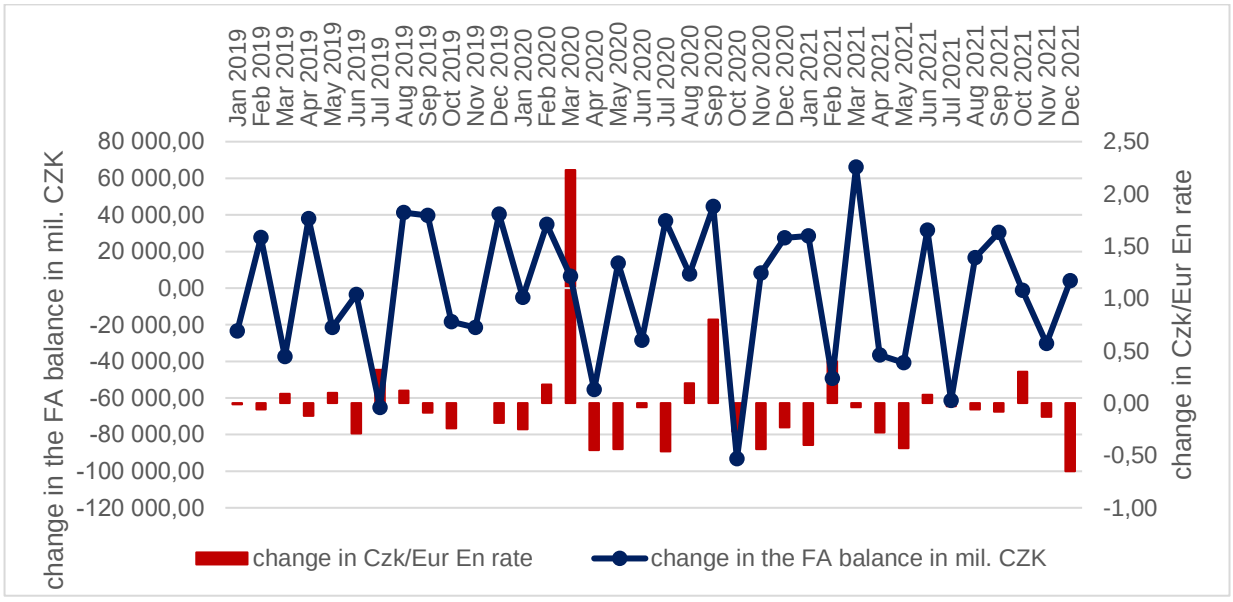
The theoretical basis of the Mundell-Fleming model implies that the increase in the differential between the CNB's repo rate and the ECB's main interest rate should cause a positive change in the financial account balance of payments (i.e., an increase in the financial account balance compared to the previous period, or a reduction of the deficit in the financial account balance compared to the previous period). On the contrary, a decrease in this differential should lead to a negative change in the financial account balance (i.e., a decrease in the financial account balance compared to the previous period, or a reduction of the increase in the financial account balance compared to the previous period). In other words, Figure 7 should show a positive correlation between the two monitored variables. As can be seen from Figure 7, there is some positive correlation between the two variables in the period under review. This positive correlation is not perfect – this can be explained mainly by the fact that the financial account balance of payments is also significantly affected by the differential between the domestic interest rate and the main interest rate of other major economies (especially the USA), as well as by the fact that the nominal main interest rates of central banks may differ from the real market interest rates of national economies, which are key to capital inflows and outflows in individual economies. These factors could therefore become the subject of further research. The first partial-hypothesis related to the Mundell-Fleming model, presented in Section 1.1, which states that there is a directly proportional relationship between the increase in the CNB's repo rate and the increase in capital inflows from abroad, or between the decrease in this rate and the increase in capital outflows abroad, can therefore be verified.

The deviation from a positive correlation between the two monitored variables is especially evident in the periods between 11.5.2020 to 23.6.2021 and 5.11.2021 to 23.12.2021. The deviation from the positive correlation in the period from 11.5.2020 to 23.6.2021 can be partially

explained by the fact that the three strongest waves of the coronavirus pandemic were during this period and harsh government restrictive measures were implemented that significantly affected the national economy and significantly increased risk in relation to the future of the domestic economy. At that moment, investors not only had to monitor the differential between the domestic and world interest rates, but also factor in the domestic economy risks related to restrictive measures, such as a significant limitation of tourism, hospitality, and also the closure of businesses, stores, or production factories.

Section 1.1 outlines that changes in capital inflows or outflows affect the nominal exchange rate *En* of the domestic currency through the excess of demand for a domestic currency over its supply, or the excess of supply of the domestic currency over its demand. Capital inflows should thus lead to an appreciation of the nominal exchange rate due to the excess of demand for the domestic currency over its supply, while capital outflows should lead to a depreciation of the nominal exchange rate due to the excess of the supply of the domestic currency over its demand. These theoretical starting points are valid for the Czech economy, within which the CNB applies a free-floating exchange rate mechanism and therefore does not have to maintain its position within a predetermined range tied to foreign currencies (usually large economies). If these conclusions relate to the defined conditions of this chapter focused mainly on foreign trade between the Czech Republic and the Euro area countries, the financial account balance should influence the nominal exchange rate between CZK and EUR. Figure 8 therefore relates month-on-month changes in the size of the financial account balance with the month-on-month changes in the nominal exchange rate. For this comparison, a monthly period was chosen because the Mundell-Fleming model is a theoretical model in which all changes manifest themselves in a very short period of time.

Figure 8 Comparison of month-on-month financial account balances of the balance of payments with the month-on-month changes in the CZK/EUR nominal exchange rate between January 2019 to December 2021



Source: CNB (2022c), Best (2022,) own calculations, own construction. Note: Monthly figures of CZK/EUR En rate are as of the end of that particular month. Changes in the balance of the financial account of the balance of payments compared to the previous month in million CZK are shown on the left axis of the chart, changes to the nominal exchange rate compared to the previous month are shown on the right axis of the chart.

From the the domestic economy perspective, the changes in the nominal exchange rate, as displayed on the right axis of the chart, are shown in indirect quotation (i.e., the amount of CZK per EUR). For example, if the nominal exchange rate rises from CZK 24 per EUR to CZK 25 per EUR, this increase will be represented on the right axis in Figure 8 by a value of 1. Thus, an increase in the nominal exchange rate (everything above 0 on the right axis of the chart) indicates a depreciation of the domestic nominal exchange rate relative to the euro, while values less than zero indicate its appreciation.

According to the theoretical basis of the Mundell-Fleming model, a positive change in the financial account balance should lead to an appreciation of the nominal exchange rate (or a lessening of its depreciation) through an excess of demand for the domestic currency over its supply, while a negative exchange of the financial account balance should lead to a depreciation of the nominal exchange rate (or to a reduction in its appreciation). In other words, there should be a negative correlation between the two monitored variables in the graph expressed as indirect quotation. Figure 8 however, does not confirm this negative correlation. Thus, the Mundell-Fleming model's partial hypothesis, which states that capital inflows from abroad will lead to an appreciation of the nominal exchange rate, while capital outflows abroad will lead to its depreciation, cannot be confirmed using the actual data presented. The discrepancy between the empirical values presented here with the theoretical basis of the Mundell-Fleming model can however, be partly justified by the fact that Figure 8 displays the evolution of the nominal exchange rate only with respect to the EUR, while capital inflows or outflows can also affect nominal exchange rates with other foreign currencies, e.g. USD, etc.

As can also be seen from Figure 8, a significant reversal in the development of the nominal exchange rate between CZK and EUR occurred in March 2020. During this period, a significant weakening of the nominal exchange rate was recorded. This can be explained by the fact that at that point a major outbreak of COVID-19 occurred for the first time in the Czech Republic, which, given the prior experiences with the disease experienced by other countries, caused considerable panic within the domestic economy due to the associated concerns about the future development of the COVID-19 pandemic within the territory of the Czech Republic and about its effects on the development of the economic situation. As a result, economic agent's confidence in the domestic currency decreased, as holding assets was seen as an increased risk. One way that economic agents could reduce this risk was to reduce their CZK holdings in lieu of the purchase of the larger economy currencies, which are usually less risky than those of small economies during such times.

The last examined phase of the Mundell-Fleming model transmission mechanism, as follows from Section 1.1., is the effect of changes in the nominal exchange rate on changes in net exports. This relationship should be achieved through a change in the real exchange rate, as displayed in Equation 1:

Equation 1: Real exchange rate

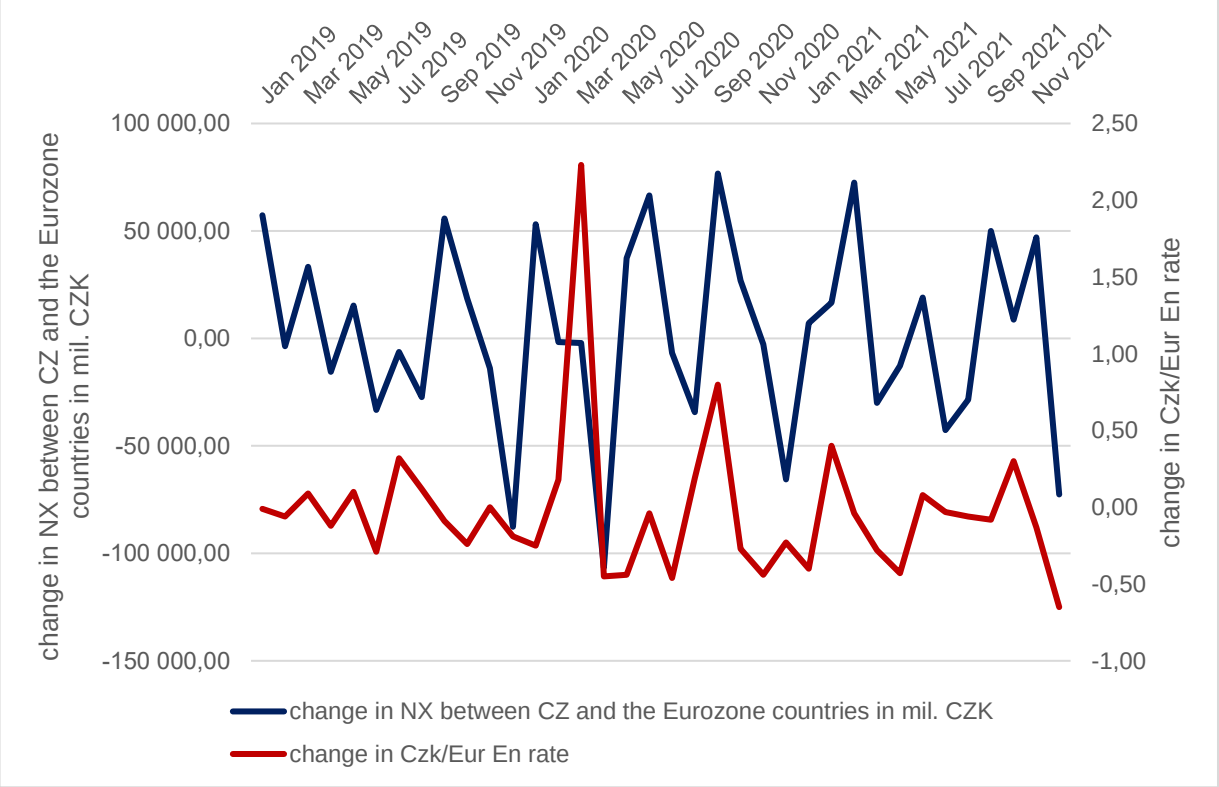
$$Er = En \times \frac{Pf}{Pd} \tag{1}$$

where *Er* is the real exchange rate, *En* is the nominal exchange rate, *Pf* is the foreign price level expressed in foreign currency and Pd is the domestic price level expressed in the domestic currency. Equation 1 implies that an increase (depreciation) of the nominal exchange rate will lead to an increase (depreciation) of the real exchange rate. Conversely, a decline (appreciation) in the nominal exchange rate will lead, ceteris paribus, to a decline (appreciation) in the real exchange rate.

This equation is applicable to small open economies with a freely floating exchange rate regime, as is utilized by the Czech National Bank. In such a monetary policy regime the nominal

exchange rate is not fixed to a basket of foreign currencies and therefore the central bank does not have to intervene in any way against its potential depreciation or appreciation. Assuming constant price levels in the domestic economy and abroad, Equation 1 implies that the depreciation of the nominal exchange rate *En* (in the case of Equation 1, i.e. the nominal exchange rate is expressed as indirect quotation, so the depreciation of the nominal exchange rate is indicated by its increase) leads to the depreciation of the real exchange rate *Er* (i.e. to its increase in Equation 1). With the depreciation of the real exchange rate *Er*, domestic goods and services would become less expensive relative to foreign goods and services and therefore more price competitive, which in turn should cause an increase in net exports of goods and services, i.e., to the foreign trade balance. On the contrary, an appreciation of the nominal exchange rate *En* should cause an appreciation of the real exchange rate *Er*, which would subsequently lead to an increase in the price of domestic goods and services when compared to foreign goods and services, and thus consequently to a decrease in the balance of foreign trade. Figure 9 therefore correlates changes in the development of the nominal CZK / EUR exchange rate with changes in the development of the foreign balance between the Czech Republic and Eurozone countries:

Figure 9 Comparison of the development of month-on-month changes in the nominal CZK/EUR exchange rate with changes in the Czech Republic's foreign trade balance with the Eurozone countries in the period of January 2019 to December 2021



Source: CZSO (2022d), Best (2022,) own calculations, own construction. Note: Monthly figures of CZK/EUR En rate are as of the end of each given month. Month-on-month changes in foreign trade balance of the Czech Republic with the Eurozone countries are displayed on the left axis of the chart in mil. CZK; month-on-month nominal exchange rate changes are displayed on the right axis of the chart.

As follows from the previous paragraph, according to the theoretical basis of the Mundell-Fleming model, Figure 9 should capture a positive correlation between the depreciation (or reduction in appreciation) of the nominal CZK/EUR exchange rate with an increase in net exports compared to the previous month (left axis of the chart) and vice versa. Figure 9 shows

that a positive correlation does occur here. The third partial hypothesis founded in this theory and mentioned in Section 1.1., namely that an appreciation of the nominal exchange rate will be accompanied by a decrease in net exports, while its depreciation will be accompanied by an increase in net exports, can therefore be verified.

A significant deviation from this correlation was recorded in March 2020, when there was a significant depreciation of the nominal exchange rate in comparison to February 2020. This depreciation can again be explained by investors reducing their risk exposure to the Czech Republic during the covid-19 outbreak as is discussed in more detail in the paragraph under Figure 8.

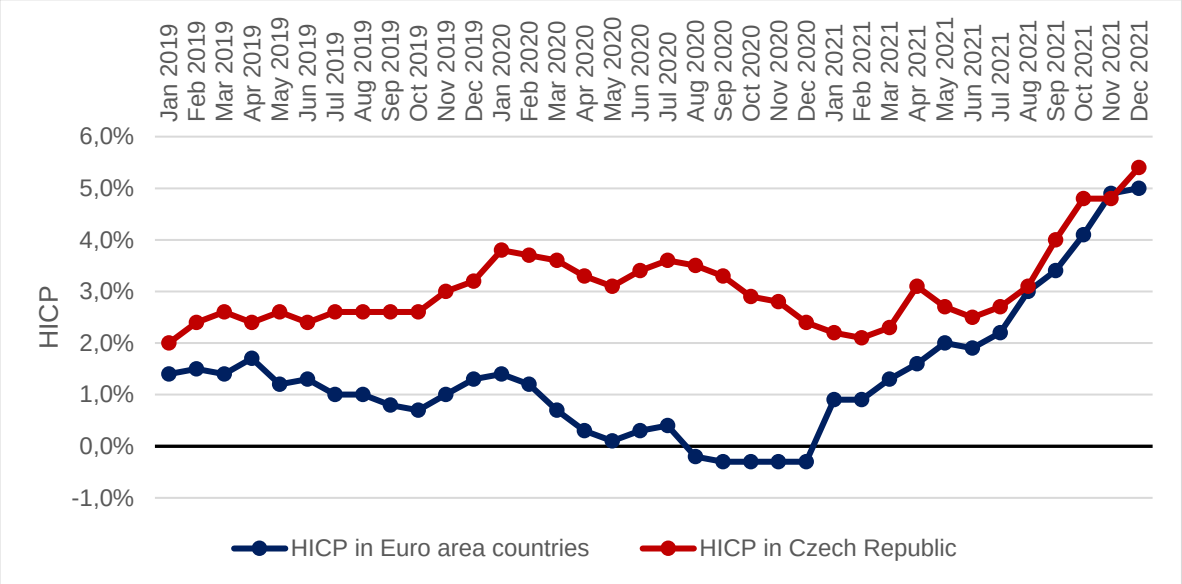
Section 1.1 suggests that, according to the theoretical basis of the Mundell-Fleming model, in a small open economy with a freely floating exchange rate, an increase in the interest rate differential between the CNB's repo rate and the ECB's main interest rate should lead to a decrease (or a reduction of the increase) of the Czech Republic's net exports to the Eurozone countries, while a decrease in this differential should lead to its increase (or reduction in the decrease). As Figure 8 illustrates, the greatest discrepancy between this theoretical foundation and the empirical data occurred at the stage of influence of cross-border capital movements on the nominal exchange rate, where the depreciation of the nominal monetary rate due to increased capital outflows abroad has not been confirmed, nor has the appreciation of the nominal exchange rate due to increased capital inflows from abroad.

2.3 Inflation and unemployment developments

Equation 1 in Section 2.2 implies that the real exchange rate *Er* and consequently the development of the foreign trade balance is influenced not only by development of the nominal exchange rate, but also by developments related the domestic and foreign price levels. Therefore, the progression of inflation in both observed territories will be examined in this section. Using the hypothesis derived from the Phillips curve in Section 1.2., we will compare the development of the inflation rate for the Czech Republic with the development of the actual unemployment rate.

Figure 10 shows a comparison of inflation developments through the Harmonised Index of Consumer Prices (HICP) in the Czech Republic and in the Eurozone countries, which we are again using as a comparison, due to its large share in the Czech Republic’s volume of foreign trade, as well as other economic indicators related to the foundational theory under investigation. The Czech Republic price level trend is represented is Equation 1 by the value *Pd* while value *Pf* represents the price level trend of Eurozone countries, delineated by the HICP since this index is comparable for both entities. (Eurostat, 2022a).

Figure 10 Comparison of price level trends in the Eurozone and the Czech Republic countries through year-on-year changes in the HICP over the period of 2019–2021



Source: Eurostat (2022b), own construction.

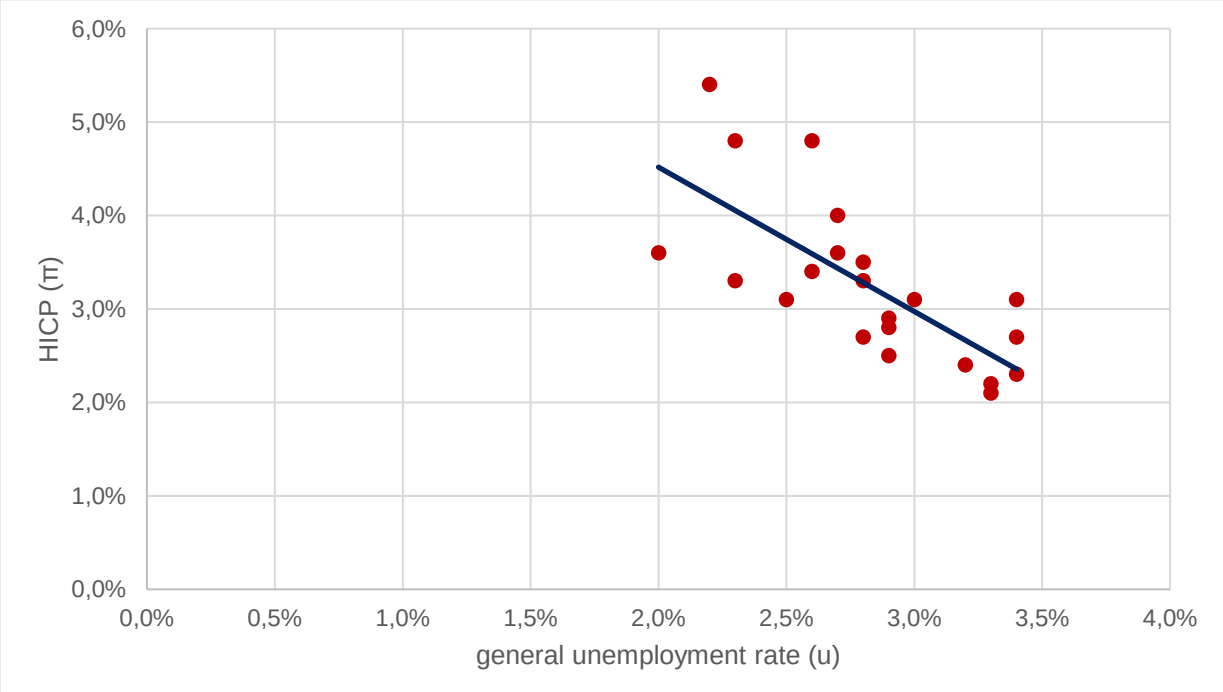
Figure 10 is based on monthly data of year-on-year changes in the HICP in order to adjust for seasonal fluctuations in inflation rates. Figure 10 shows that over almost the entire period under review, the domestic price level *Pd* grew at a faster rate than the price level in the Euro area countries *Pf*. The faster growth of domestic price level *Pd* when compared to the growth of foreign price level *Pf* reduces the value of the fraction $\frac{Pf}{Pd}$ in Equation 1. Equation 1 further shows that a decrease in the value of this fraction also reduces the value of the real exchange rate *Er*, which indicates its appreciation. The appreciation of the real exchange rate should ultimately lead to a decrease in the balance of the Czech Republic's foreign trade with the Eurozone countries via the transmission mechanism described in Section 2.2. According to the abovementioned theory, during the months in the period under review when the nominal exchange rate *En* appreciated (see. Figure 9 in Section 2.2), the effect of a faster increase of the Czech Republic price level *Pd* in comparison to the increase in the Eurozone country price level *Pf* should therefore act in congruence with the effect of nominal exchange rate *En* appreciation. Both the faster growth of the domestic price level *Pd,* when compared to the foreign price level *Pf,* and the appreciation of the nominal exchange rate *En* should lead to an appreciation of the real exchange rate *Er* during those specific months. Contrarily, in the months in which the nominal exchange rate *En* depreciated (see. Figure 9 in Section 2.2.), the effect of a faster increase in the domestic price level *Pd,* when compared to the price level in the Eurozone countries *Pf*, should act in an adverse direction, when compared to the development of the nominal exchange rate *En*. Despite the different development of the nominal exchange rate *En* in individual months (see. Figure 9 in chapter 2.2.), the higher inflation rate in the Czech Republic when compared with the Eurozone countries during the entire period should reduce the Czech Republic's net exports to the Eurozone countries, i.e., should create a decrease in the foreign trade balance.

For the period under review, Figure 10 shows that the largest differences to inflation developments between the Czech Republic and the Eurozone countries occurred mainly during 2020, when the year-on-year HICP for the Czech Republic ranged from 2.4% (December 2020) to 3.7% (January 2020). In contrast, the year-on-year HICP, calculated as the Eurozone average, was at deflationary levels throughout the course of 2020, with the index even showing negative values between -0.2% (August 2020) and -0.3% (September, October, November and

December 2020) during the second half of 2020. Over the course of 2021, a relatively sharp increase in inflation was recorded in both territories. The year-on-year HICP in the Czech Republic during February 2021 was at 2.1%, however, by December of that year the index had reached 5.4%. The index for the Eurozone country average reached 5% in December 2021, despite deflation being recorded as recently as December the year before. In both regions, this sharp increase in inflation was mainly driven by rising transport prices, where prices in the Czech Republic rose even faster (up to 15% in December 2021) than the average of the Eurozone countries (up to 12.2% in November 2021). Compared to the average of the Eurozone countries, higher price inflation categories in the Czech Republic were: clothing and footwear prices (up to 14.9% in December 2021), furniture, household equipment and maintenance prices (up to 6.8% in December 2021) and alcoholic beverage and tobacco product prices (up to 10.7% in February 2021). In contrast, the eurozone average reached a higher level of HICP in terms of rental, water, electricity, gas and other fuel prices (up to 9.7% in December 2021). However, no significant increase in prices of this consumer basket was recorded in the Czech Republic, mainly due to the relatively high baseline and prior price increase in 2020 (Eurostat, 2022b).

In connection with inflation developments, Section 1.2 briefly presented the recognized economic phenomenon of the Phillips curve, the modified version of which interrelates the actual unemployment rate with the development of the inflation rate. This chapter therefore illustrated this relationship using empirical data from the Czech Republic from March 2020 (the month in which COVID-19 was first confirmed in the Czech Republic) until the end of 2021. The actual unemployment and inflation rates in the examined period in the Czech Republic are shown in Figure 11:

Figure 11: Modified version of the Phillips curve based on the relationship between the general unemployment rate and the year-on-year Harmonised Index of Consumer Prices for the Czech Republic from March 2021 to December 2021



Source: Eurostat (2022b), CZSO (2022e), own construction. Note: The general unemployment rate "u" (the share of unemployed persons in the total workforce aged 15 to 64 according to international definitions) is shown on the horizontal axis of the graph, the year-on-year HICP is shown on the vertical axis of the graph.

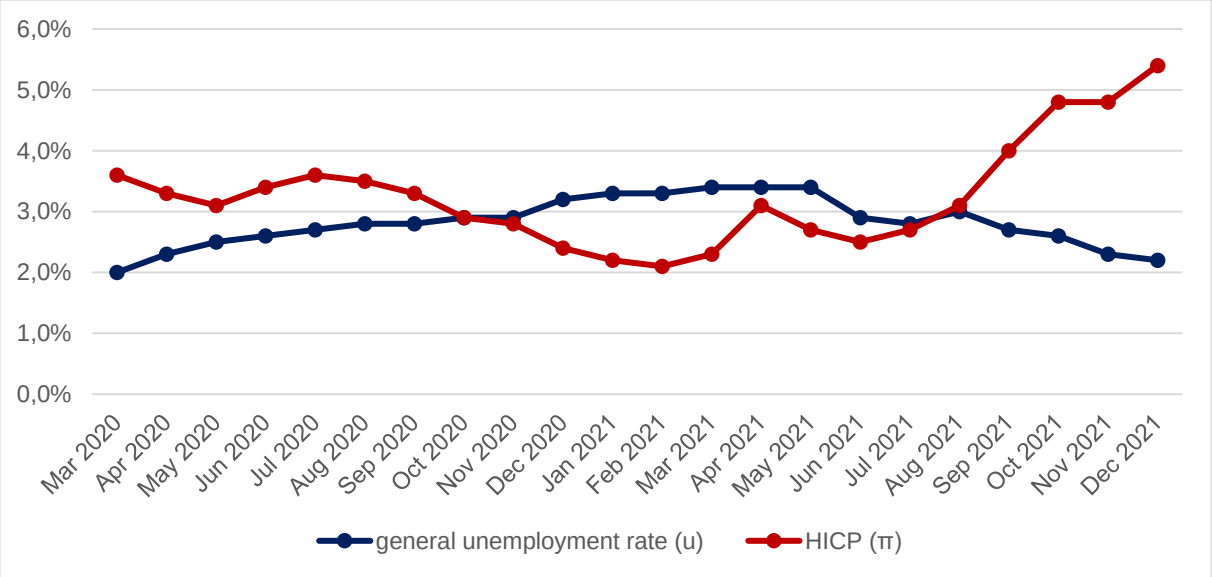
As Figure 11 demonstrates, there is an inversely proportional relationship between the general unemployment rate and the Harmonised Index of Consumer Prices in the Czech Republic for the period between March 2020 and December 2021. During this period, the higher the inflation rate π is in the Czech Republic, the lower the actual unemployment rate is. Conversely, with a decreasing inflation rate π, the actual unemployment rate usually rises. The relationship between the development of the inflation rate π and the development of the actual unemployment rate u (red curve) is given in Figure 11 by the linear trendline (blue line).

The inversely proportional relationship between the actual unemployment rate and the inflation rate π illustrated by Figure 11 is also confirmed by this linear trendline.[1] The hypothesis presented in Section 1.2, stating that there is a negative correlation between the inflation rate and the actual unemployment rate, can therefore be confirmed based on the data for the Czech Republic, for the period during the coronavirus pandemic of between March 2020 to December 2021. This fact could be considered for future CNB Board monetary policy decision-making.

A comparison of the evolution of the actual unemployment rate and the Harmonized Index of Consumer Prices π during this period is shown in Figure 12. This illustration confirms the inversely proportional development of the monitored indicators.

In regard to developments in unemployment, it can be stated that the Czech Republic was not significantly affected by the COVID-19 pandemic in terms of labour markets developments. The Czech Republic entered this period of crisis with the lowest unemployment rate in EU countries (2.0% in March 2020). In response to the outbreak of the COVID-19 pandemic, the unemployment rate in the Czech Republic began to rise slightly to peak at its highest level in May 2021 (3.4%). However, by the end of 2021, the unemployment rate had almost returned to its pre-pandemic level (CZSO, 2022e).

Figure 12: Comparison of HICP developments and the actual unemployment rate in the Czech Republic in the period from March 2020 to December 2021



Source: Eurostat (2022b), CZSO (2022e), own construction.

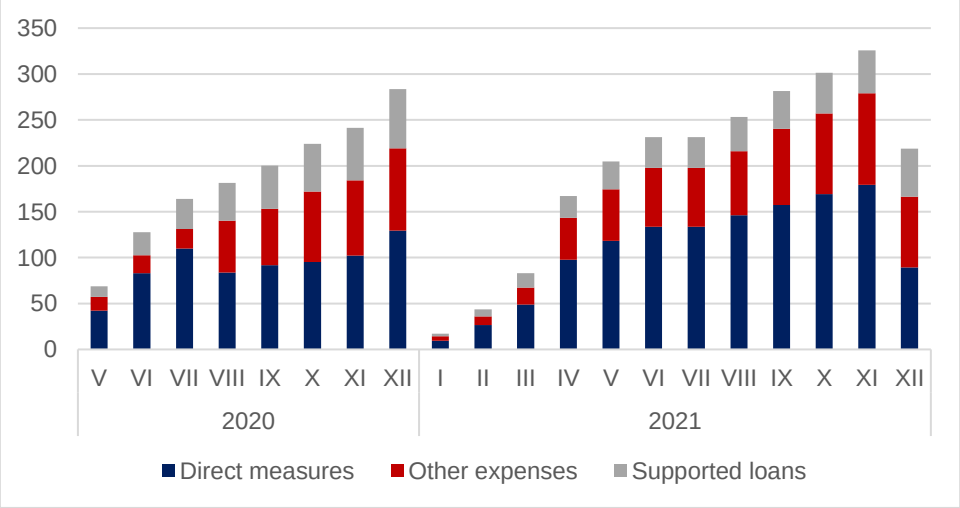
[1] The investigated data were also analysed using econometric software E-views. According to the correlation matrix, the correlation coefficient between the harmonized index of consumer prices *HICP* and the real unemployment rate u is -0.72. According to the t-test, the null hypothesis states that there is no correlation at the 5% level of significance can be rejected (p-value is 0.0001). The negative correlation between the two variables can thus be described as statistically significant.

2.4 Fiscal impulse during the COVID-19 pandemic

The Czech government introduced several parallel measures with the aim of mitigating the impact of the pandemic situation on the Czech economy, despite the Mundell-Fleming model suggesting that fiscal policy is not effective in small open economy cases. Supportive measures came in several forms and included, for example, compensatory bonuses for the self-employed, electronic sales record deferrals, tax relief (VAT) on medical devices used to diagnose of COVID-19, a crisis care allowance for parents of school age children, and the Covid - Uncovered Costs program (Government of the CR, 2021). One of the most significant, and also the most controversial, measures was the Antivirus program (operating in three modes A, A+ and B), whose main objectives, according to the government, were to protect both jobs and the health of the economy. The largest amount of funding from this programme was directed into the trade, hospitality and accommodation, and manufacturing sectors (Ministry of Labour and Social Affairs, 2021).

In 2020, a total of CZK 283 billion (see Figure 13) was released from public budgets to support citizens and companies affected by the COVID-19 pandemic (as well as on individual government measures taken to slow down the pace of SARS-CoV-2 spread). In 2021, almost CZK 330 billion had been spent as of November 2021. However, in December 2021, the new government eliminated certain items that had previously been reported as "covid support". These include, for example, real estate acquisition tax abolition, super-gross wage abolition, taxpayer rebate abolition, tax loss carryback introduction, etc. According to the current government, growth of expenditure had been hidden by the previous government by including certain items in "covid support". Actually, the increase in public spending is more easily explained by the existence of the so-called political cycle, as it was in the phase where governments tend to increase their spending pre-election period. When looking only at state (not public) expenditure, according to previous government methodology approximately 14% of government expenditure went towards “covid support” in the period up until November 2021. However, according to new government methodology, this “support” subsequently amounted to less than 9% of expenditure in December 2021. According to new government methodology, a third of the total expenditure associated with measures introduced in the fight against the COVID-19 pandemic was directed to the health sector (CZK 77.2 billion for 2021).

Figure 13 Measures taken to support citizens and businesses, including health and social services expenditure, incurred in relation with COVID-19 (billion CZK)

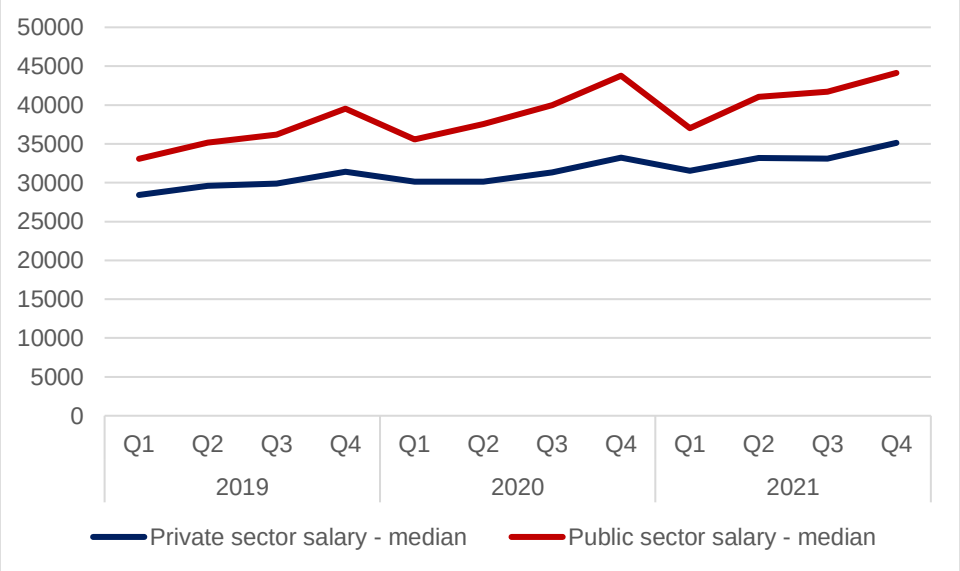


Source: Ministry of Finance of the Czech Republic (2022), own construction. Note: data shown cumulatively, from the beginning of each calendar year. Since August 2020, the structure of the published statements has changed, therefore the reported volume of individual items in the Direct measures and Other expenses sections has also changed.

2.5 Impact of the COVID-19 pandemic on other labour market indicators in the Czech Republic

As shown in Section 2.3, the COVID-19 pandemic has not significantly affected the unemployment rate in the Czech Republic, but this indicator is not the only key labour market characteristic. In this section, we therefore also focus on the analysis of the development of other labour market indicators. Figure 14 shows the evolution of median public and private sector salaries over the period of 2019-2021. During the COVID-19 pandemic, the public and private sector salary gap has gradually started to widen, putting pressure on private sector salary growth. If we look at the breakdown of economic activities according to CZ-NACE, then the highest public sector salaries are received by employees in health and social care, as the median gross monthly salary reached CZK 46,802 in the third quarter of 2021. In contrast, the lowest public sector salaries are among those whose work focuses on cultural, entertainment and recreational activities (median CZK 33,239). In the private sector, the salary differentiation is more pronounced. The highest gross monthly private sector income is recorded in the information and communication activities sector (median CZK 52,285), while employees of the accommodation, catering and hospitality sector receive the lowest salaries (median CZK 20,836). However, a significant part of their income often comes from remuneration that is not officially reported as monthly earnings. After taking this into account, the private sector with the lowest salaries is the administrative and support activities sector (median CZK 24,226).

Figure 14 Development of median public and private sector salaries (CZK)

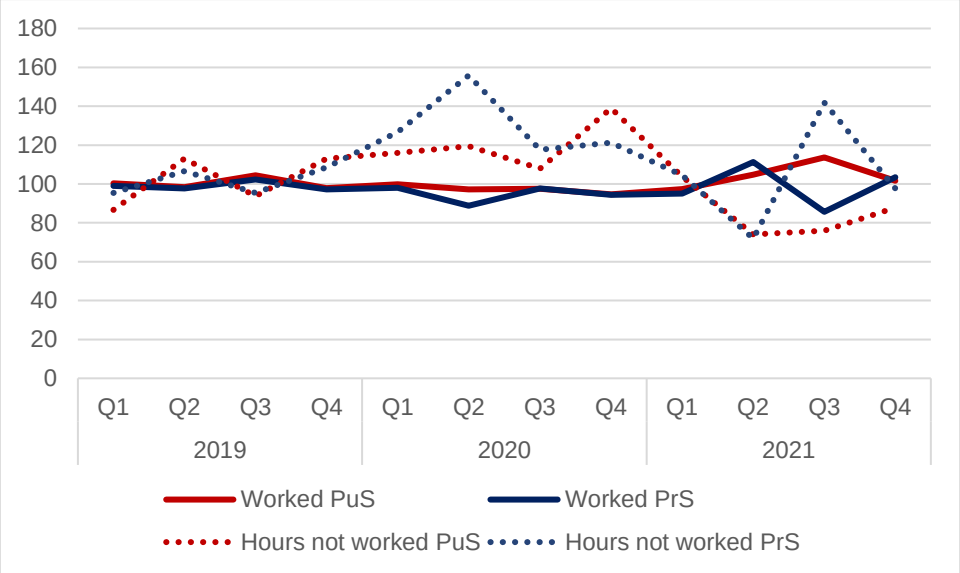


Source: ISPV (2022), own construction

One of the probable reasons behind the widening of the gap between public and private sector salaries is the overall higher workload of the public sector during the COVID-19 pandemic, as well as the restrictions imposed on some activities in the private sector. Figure 15 shows the number of average monthly hours worked in the public and private sectors on a full-time basis. The largest gap between hours worked in the public and private sectors was recorded in the second quarter of 2020, when the number of hours worked fell by 11% year-on-year in the private sector, but only by 3% in the public sector. A further significant decrease in hours worked in the private sector occurred year-on-year in the third quarter of 2021. The reason may be the aforementioned restricted economy phenomenon, when certain types of production faced an input shortage. Figure 15 also shows the number of hours that were unworked in full-time jobs.

Again, the impact of the COVID-19 pandemic on the private sector is more noticeable than on the public sector. The decrease in the second quarter of 2021 is again due to a comparison with a high baseline set in the second quarter of 2020, a period of significant restrictions of Czech economy operation. A high number of hours not worked undermines a country's economic performance as measured by aggregate labour productivity.

Figure 15 Index of worked and unworked hours in the public and private sectors (year-on-year comparison)



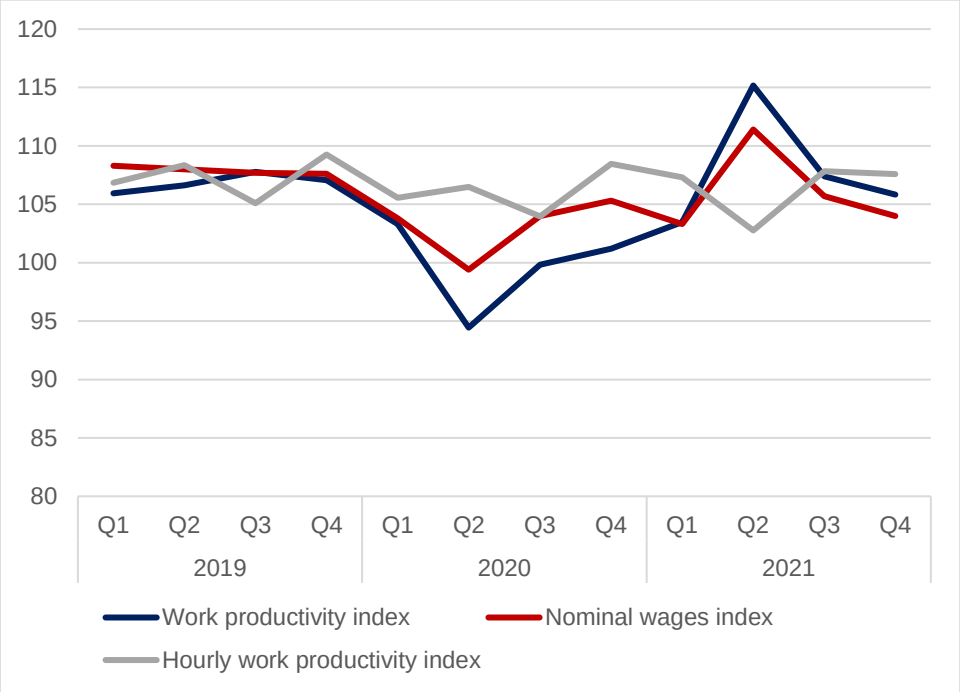
Source: ISPV (2022), own calculations, own construction. Note: PuS = Public Sector, PrS = Private Sector

The general increase in gross monthly incomes illustrated above can be a macroeconomic destabilizing factor if public and private sector salary growth are not a reflection of labour productivity growth. Higher growth in labour costs compared to labour productivity leads to inflationary pressures. Figure 16 shows our calculations of the aggregate labour productivity index[2]. The data demonstrates that this phenomenon may be one of the factors that contributed to fueling inflation in 2021. Until the offset of the COVID-19 pandemic, labour costs and labour productivity had developed similarly. Since the beginning of the COVID-19 pandemic, nominal wage index increased more rapidly than work productivity index.

The issue for the Czech economy was not the decline in hourly labour productivity, which is often mentioned in analyses of workforce productivity. The key issues were work outages caused by the closure of retail and other parts of the Czech economy, periods of quarantine, periods of COVID-19 illness, and the need to devote time to caring for relatives with COVID-19. Our calculations show that hourly labour productivity did not fall during the COVID-19 pandemic, even when adjusting for the increase in the price level. On the contrary, when compared to the same period of the previous year, labour productivity increased during hours worked, especially in the last quarter of 2020 and the first quarter of 2021.

[2] Calculated as the ratio of aggregate labour productivity in a given year to aggregate labour productivity in the same quarter of the preceding year, with aggregate labour productivity calculated as a proportion of nominal GDP and the number of persons employed in that period.

Figure 16 Aggregate labour productivity indices and nominal salary index (same period of the previous year = 100)



Source: ISPV (2022), CZSO (2022), own calculations.

Conclusion

The COVID-19 pandemic and the restrictive measures introduced were (and still are) a significant external shock not only for the Czech economy. Due to its dynamic and difficult to predict developments, examining its economic and societal impacts in detail is of high importance. A similar health crisis may potentially occur again in the future, therefore retrospective evaluation of the effectiveness of implemented economic policy measures is necessary to make this knowledge available to future public policy makers should they ever face a similar negative shock. Contemporary economic literature has not yet provided a comprehensive analysis of this kind that focuses only on the Czech Republic. We have therefore tried to fill this gap in this article.

The following key conclusions emerge from the above analysis:

- The slump in the Czech economy during the COVID-19 pandemic was mainly due to declines in fixed capital formation and household consumption. It was offset by an increase in government spending. It was a combination of both demand shock (caused by pessimistic expectations, sudden income drops, etc.) and supply shock (caused by lockdowns and other restrictions).
- Only two out of the three proposed partial hypotheses resulting from the theoretical basis of the Mundell-Fleming model have been confirmed by our research. A positive correlation was confirmed between the changes in the repo rate differential announced by the CNB and changes in the financial account balance. The expected correlation between changes in the financial account balance and changes in the nominal exchange rate was not confirmed. The correlation between changes in the nominal exchange rate and changes in the Czech Republic's net exports was confirmed.

- During the COVID-19 pandemic, the relationship described by the so-called modified Phillips curve manifested in the Czech Republic. Monthly data of the general unemployment rate and monthly data of the year-on-year inflation rate, show that an indirect relationship between these indicators existed.
- To reduce the impact of anti-epidemic measures on Czech entities, the Government of the Czech Republic introduced an expansionary fiscal policy, i.e., an increase in government spending. In 2020, a total of CZK 283.4 billion was spent in support of citizens and companies, and in 2021, according to the methodology of the previous government, CZK 325.4 billion was spent. However, the new government (elected in October 2020, taking office from 8 November 2021) pointed out that the increase in spending that was not related to supporting those affected by the COVID-19 pandemic, but was actual a politically motivated decision in reaction to the upcoming elections. Overall, loosened fiscal policy (applied both in response to the crisis period and in relation to the pre-election period of the political cycle) most likely contributed to the increase in the price level in the Czech Republic.
- The increased burden on the public sector and the outages in private sector activity have led (among other things) to a widening of the gap between salaries in the public sector and those in the private sector. Salary increases have not been accompanied by corresponding increases in labour productivity. Our calculations have shown that nominal wage growth exceeded the growth of aggregate labour productivity in the Czech economy. This was another causal factor of the subsequent rise in price level. Hourly labour productivity did not decrease during the COVID-19 pandemic, on the contrary, it grew in nominal and in real terms.

In the current period (Spring 2022), the Czech economy is facing four key challenges. Two of which emerged from the COVID-19 pandemic. The first destabilizing factor, widely discussed in this article, is the high growth of the price level. The second problem is the deepening of the scarcity economy, which has arisen from the disruption of purchaser-supplier relations because of lockdowns and other restrictions imposed by governments around the world. The third problem is the ongoing energy crisis, which was caused by the sudden reawakening of the economy after the COVID-19 pandemic, reduced investment in fossil fuels coupled with delays in switching to renewable energy sources and the reduction of natural gas reserves after the freezing winter of 2020/2021. A major threat associated with the increase in energy or fuel prices that the Czech Republic is currently facing is the war in Ukraine. In conclusion, although the COVID-19 pandemic is currently in decline and the Czech economy is showing recovery, maintaining macroeconomic stability in the Czech Republic will continue to be an extremely difficult task for domestic policy makers.

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