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UNCONVENTIONAL MONETARY MEASURES DURING THE COVID-19 PANDEMIC: A CASE STUDY FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES

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Abstract: The COVID-19 pandemic had major negative repercussions on the countries from Central and Eastern Europe (CEE), which experienced almost similar declines in the economy in 2020. Against this background, central banks from CEE initiated unconventional monetary policy measures aimed at mitigating the economic and social effects of the pandemic. The purpose of this article is to analyse the CEE central banks' response to the pandemic crisis, i.e., the response of the Czech Republic, Hungary, Poland, and Romania, and to unveil the particularities of the unconventional monetary policy adopted by these states. To achieve this goal, the article presents a chronology of the main decisions adopted by CEE central banks during the pandemic and the dynamics of these central banks' assets. The main findings suggest that CEE monetary authorities, like major central banks, initiated the first measures to counter the negative effects of the pandemic on the economy in March 2020. All of them cut the key interest rate and injected liquidity through open market operations in order to support lending to the real economy. However, the magnitude of these measures was different depending on the economic and financial systems' peculiarities. Moreover, not all of them initiated purchases of assets or new lending facilities.

JEL classification: E50, E52, E58

Keywords: COVID-19 pandemic, Central and Eastern Europe, central banks, unconventional monetary policy

1. Introduction

The global financial crisis has had a major impact on financial markets, being considered at that time the most severe economic and financial meltdown since the Great Depression. It was followed by the Covid-19 pandemic, *"a crisis like no other"* (IMF, 2020), surpassing by its downturn the global financial crisis. At the centre of these crises, central banks were the main pillar of support, from the perspective of

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measures to temper tensions and mitigate negative effects. They responded in significant and innovative ways. As standard monetary policy instruments were limited to face these “exceptional times, exceptional measures were needed” (Lenza et al., 2010). And these measures were represented by a set of unconventional monetary instruments, which have become the new normal for reducing the negative effects of economic and financial turmoil.

The Covid-19 pandemic worked the other way that the global financial crisis did, i.e., the isolation measures firstly affected the real economy, and subsequently, the financial sector (BIS, 2020). Against this background, central banks acted differently this time, being focused primarily to cushion the contraction of the real economy, and later to stabilize financial markets. Lessons learned by central banks during the 2007-2009 period facilitated rapid market intervention, so as their response was swift and unprecedented.

At the beginning of the pandemic, central banks from developed countries aimed to prevent the transformation of the economic downturn into a financial crisis, intervening by purchasing assets and providing liquidity under favourable conditions to the banking system (Cavallino and De Fiore, 2020). As the incomes of the population and companies began to fall, the objective of the central banks was to cushion the contraction of economic activity, aiming to facilitate the granting of credits to the private sector. Interest rates were cut in less than a month, much faster than during the global financial crisis, by the Federal Reserve (Fed), the Bank of Canada and the Bank of England. While the European Central Bank (ECB) and the Bank of Japan no longer had this monetary policy tool, given that the interest rate was already close to zero, they committed to ensure favourable financing conditions, to provide liquidity and new credit facilities to the financial system (Nițoi et al., 2022). Also, as the need for liquidity in foreign currency increased, the ECB and the Fed concluded currency swap agreements with other central banks, in order to avoid increasing financial instability at the international level.

The response of the monetary authorities from emerging economies to the Covid-19 pandemic also differed from previous crisis. According to Aguilar and Cantú (2020), it was determined by the cyclical position of the emerging economies in the period preceding the pandemic. They were in the downswing of the business cycle, along with positive inflation gaps, unlike the 2007-2009 period, when most of them were in the expansionary phase. While their cyclical position opened space for monetary policy easing, significant improvements in the inflation control during the past two decades improved the anchoring of inflation expectations (Yetman, 2020). This group of countries implemented domestic lending operations and funding facilities to reduce liquidity risks. Moreover, some central banks started unprecedented asset purchase programmes of long-term government securities in the secondary market. Central and Eastern Europe (CEE), like major developed economies, initiated the first measures to counter the negative effects of the pandemic on the economy in March 2020. All of them reduced the key interest rate and injected liquidity through open market operations in order to support lending to the real economy. However, the magnitude of these measures was different depending on their economic and financial systems’ peculiarities. Moreover, not all of them initiated purchases of assets or new lending facilities.

Considering the specific of the Covid-19 pandemic crisis, but also the differences in monetary policy instruments used, this article has two aims. The first objective is to analyse the CEE central banks’ unconventional monetary measures adopted during the pandemic crisis. We chose to analyze the four major central and eastern European countries that are non-euro area EU Member States, i.e., the Czech Republic, Hungary, Poland, and Romania. The second aim is to unveil the main particularities of the unconventional monetary decisions taken by these states.

The paper unfolds as follows. The second section provides a brief overview of relevant literature on unconventional monetary measures adopted during the pandemic crisis by different group of economies, the third section outlines the methodology employed to pursue the research, the fourth section provide the results of the study, and the last section presents the main conclusions.

2. Literature review

The global financial crisis highlighted the limitations of standard monetary instruments to contain the financial turmoil and stabilise the economy. According to Fawley and Neely (2013), these limitations come from the decisions taken by individuals, if they choose to hold cash over a bank deposit, reference interest rates cannot fall (much) below zero. Moreover, while policy rates approached the zero bound during the 2008-2009 period in major developed countries (United States, United Kingdom, Japan, and the euro area), their central banks had to be more inventive for stabilizing financial conditions and supporting aggregate demand. They started a series of less conventional instruments, including the purchases of government bonds with long-term maturities in order to reduce the long-term interest rate, broad liquidity provision to financial institutions, and direct and specific interventions on key credit markets (Klyuev et al., 2009). All these instruments, known as quantitative easing (QE) policies, determined the increase of the monetary base and the improvement in credit conditions. Also, forward guidance became one of the main tools to maintain well anchored inflation expectations during the global financial crisis. Although history shows that the use of QE policies preceded the global financial crisis, specifically, the central bank of Japan being among the first central banks to use quantitative monetary policy, the 2008-2009 period established the use on a broad scale of unconventional monetary policies.

Consequently, QE programmes have spurred an important body of research, investigating either the efficacy of unconventional tools and their impact on the financial markets, or the differences between the set of tools used by major central banks.

The most prominent studies analyze the efficacy of QE programs deployed by the Fed during the 2008-2009 period (Gagnon et al., 2011; Neely, 2012; Neely, 2015; Hesse, 2018; Swanson, 2020 etc.), or by the other major central banks, as ECB (Altavilla et al., 2015; Andrade et al., 2016; Bernoth et al., 2016; Bulligan et al., 2018;) or the Bank of England (Joyce et al., 2011). According to Gagnon et al. (2011) and Neely (2012), larges-scale asset purchases have determined a reduction in long-term yields in the US.

Given that the response of major central banks to the exceptional events differed both in the specifics of the measures adopted and, in their rhetoric, substantial research was conducted on the differences and common features of these measures (Klyuev et al., 2009; Trichet, 2009; Lenza et al., 2010; Fawley and Neely, 2013), etc. According to Lenza et al. (2010), the main differences between the unconventional tools used by the ECB, Fed and the Bank of England, during the global financial crisis, came from a different operational framework for implementing monetary policy and a different structure of the financial systems in their countries. For instance, considering the major role of banks in financing the euro area economy, the ECB chose to extend its credit facilities to the banking system during the global financial turmoil rather than to other counterparties as the Fed. Moreover, the extent to which the ECB balance sheet have risen differed from other major banks, i.e., the Fed or the Bank of England.

The peculiarities of the Covid-19 crisis determined central banks to act faster and larger than they did during the global financial crisis, leading to unprecedented increase in central banks' balance sheet. Massive asset purchases aimed at mitigating the most negative feedback loops between financial markets and the real economy. The monetary response of central banks, from both developed and emerging economies, and their effectiveness were largely discussed by Beckmann et al. (2020), Cavallino and De Fiore (2020), Aguilar and Cantú (2020), Arslan, et al. (2020), Occhino (2020), Richard et al (2021) etc. Beckmann et al. (2020) analysed the effects of asset purchases in the euro area and concluded that QE is particularly effective during times of significant financial stress, losing its impact over time. According to Richard et al (2021), the policy response of Fed was decisive, it provided crucial support to the economy during the pandemic, by launching within weeks a series of innovative facilities to support the flow of credit to households and businesses. In emerging economies, asset purchases helped cushion the impact of portfolio outflows on local currency sovereign bond markets (Aguilar and Cantú, 2020). Moreover, they departed from their monetary policy playbook and cut rates even in the condition of currency depreciations and capital outflows. In addition, some central banks started unprecedented asset purchase programmes of long-term government securities in the secondary market, preventing fire sale spirals in emerging markets (Arslan, 2020).

Despite this profusion of research, there has been little attempt to describe and compare unconventional monetary policies across CEE central banks during the Covid-19 crisis. This article fills this gap by describing and comparing non-standard monetary tools in the Czech Republic, Hungary, Poland, and Romania. However, this article does not investigate the effectiveness of these instruments on the financial markets and the real economy.

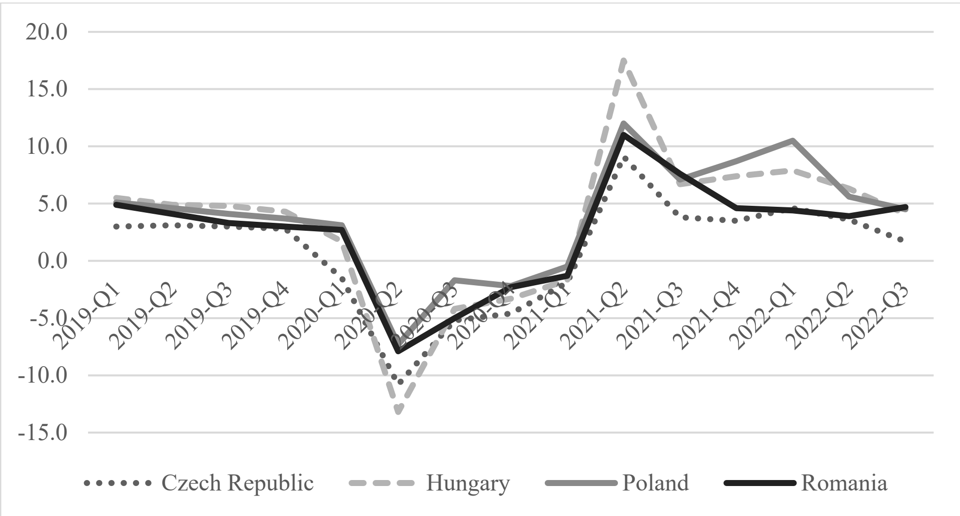
3. Methodology and data

The methodology employed to achieve the aims of the article consists in a chronological analysis of the main non-standard monetary measures in the Czech Republic, Hungary, Poland, and Romania, adopted between March 2020 - May 2021, along with the analysis of two important monetary policy indicators, i.e., the key interest rate and the central banks' assets, during the 2020-2022 period. The information on the unconventional monetary decisions was gathered from the official database of the Bank for International Settlements (BIS). According to the BIS database (2021), between March 2020 - May 2021, the Czech National Bank adopted six monetary policy decisions to counteract the negative effects of the Covid-19 crisis, the National Bank of Hungary adopted 28 monetary policy decisions, while the National Bank of Poland and the National Bank of Romania taken each 9 monetary policy decisions. The data for key interest rate was extracted from the official database of the BIS, while the central banks' assets were retrieved from the official databases of the central banks from the Czech Republic, Hungary, Poland, and Romania.

4. Results and discussion

The major countries from CEE, i.e., the Czech Republic, Hungary, Poland, and Romania, were severely affected by the pandemic and experienced almost similar declines in 2020. All recorded a drop in GDP for four consecutive quarters, except for the Czech Republic, which experienced an economic contraction starting from the first quarter of 2020 (Figure 1). The biggest GDP contractions took place in the second quarter, in all states, with Hungary being the most affected by the pandemic event. The Hungarian economy recorded a decrease of -13.2%, followed by the Czech Republic, Romania and Poland, whose GDP contracted by -10.8%, -7.9% and -7.3%, respectively.

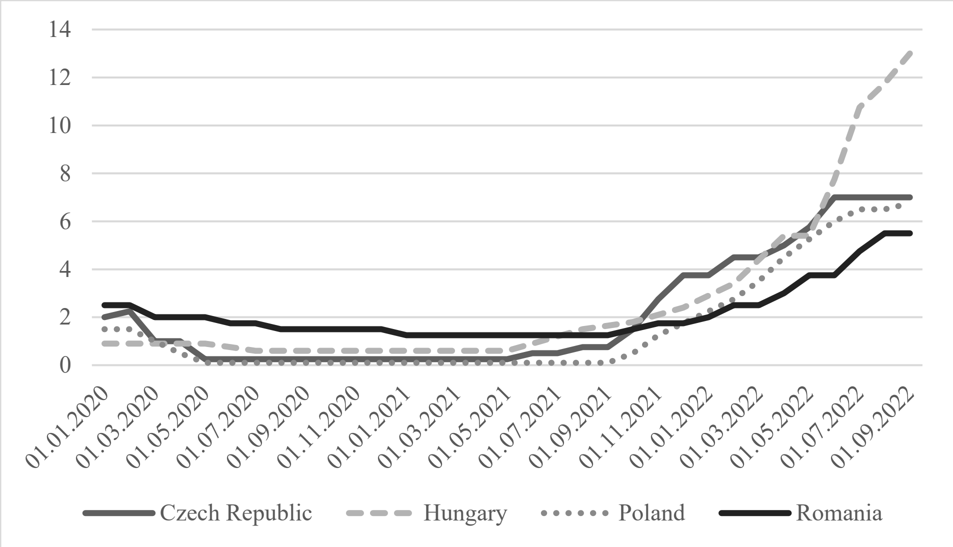
Figure 1: GDP growth rate in the Czech Republic, Hungary, Poland, Romania, during the 2019-2022 period (in %)



Source: author's representation based on Eurostat data (2022).

Against this background, central banks from CEE adopted a series of unconventional monetary policy decisions aimed at mitigating the economic and social effects of the pandemic. Thus, in March, the National Bank of the Czech Republic cut the reference rate twice, by 50 basis points and by 75 basis points, respectively (Figure 2). At the same time, the National Bank of Poland cut, for the first time since 2015, the interest rate by 50 basis points, decreased the required reserve ratio for banks by 300 basis points, initiated the injection of liquidity through repo operations and the purchase of government bonds on the secondary market. The National Bank of Romania reduced the interest rate by 50 basis points, lowered the interest on the credit facility, and initiated, for the first time, the purchase of government bonds on the secondary market (Clichici et al., 2020a).

Figure 2: Monetary policy interest rate in the Czech Republic, Hungary, Poland, Romania, during the 2020-2022 period (in %)



Source: author's representation based on BIS data (2022).

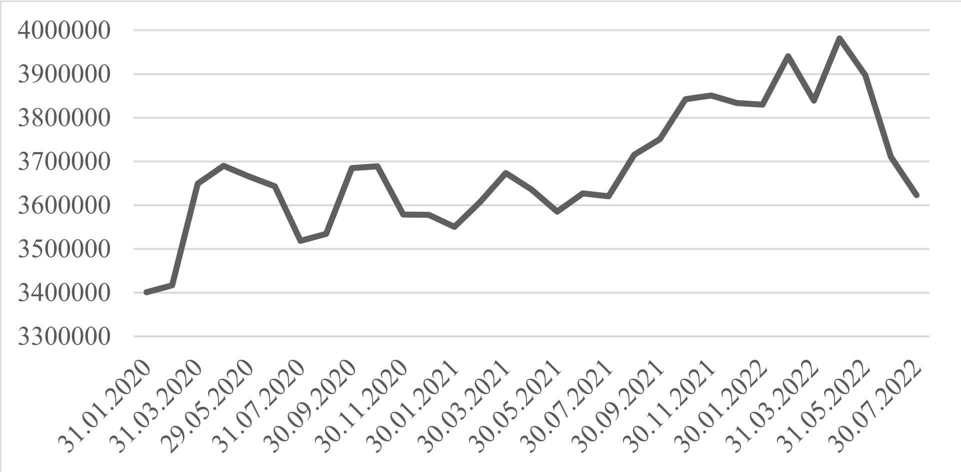
Only the National Bank of Hungary hesitated to cut the interest rate at the beginning of the pandemic, opting for this step only in June. Instead, it introduced a new instrument of unlimited bank lending at a fixed interest rate and postponed the application of the minimum reserve requirements, in order to make available financial resources and facilitate lending to the economy.

At the same time, CEE central banks recorded different growth rates of balance sheets during the pandemic, the highest growth being observed in Hungary and Poland, by 64.3% and 40%, respectively, while Romania and the Czech Republic used asset purchases to a significantly lesser extent. Thus, the assets of the National Bank of Romania increased by only 19% in 2020, while those of the Czech National Bank registered a marginal increase of only 4.9% compared to the previous year (Clichici et al., 2020b).

4.1. The unconventional monetary policy adopted by the Czech National Bank

Starting from March 12, 2020, the government of the Czech Republic declared a state of emergency in the context of the new coronavirus, which was later extended until May 17, 2020. During this period, a series of measures were taken to limit infections. In this context, aiming to mitigate the economic and social effects of the pandemic, in March the Czech National Bank cut interest rates by 125 basis points and initiated liquidity-providing repo operations three times a week. In addition, given the high uncertainty regarding the economic evolution, it advised banks to refrain from paying dividends or any other measures that could endanger the resilience of the banking system, until the consequences of the pandemic disappear. In the same month, the assets of the central bank of the Czech Republic experienced a rate growth of 6.8% compared to the previous month, reaching the value of 3,649 billion Czech crowns (Figure 3).

Figure 3: Total assets of the Czech National Bank, during the 2020-2022 period (in millions of Czech crowns)



Source: author's representation based on the Czech National Bank data (2022).

Considering the economic decline recorded in the second quarter, of -10.8%, the monetary authorities decided in May 2020 to extend the maturity of repo operations to three months and the range of collateral eligible for them, cutting the interest rate with 75 basis points (Table 1).

Table 1: Monetary policy measures adopted by the National Bank of the Czech Republic, between March 2020 - May 2021

Month of adoption of the measure	Monetary policy measures
March 2020	• cut the key interest rate twice in March, by 50 basis points, and by 75 basis points, respectively, on March 16 and March 23; • stated that it is ready to react to any excessive fluctuations in the koruna exchange rate using its instruments on March 16; • initiated liquidity-providing repo operations three times a week at a fixed rate on March 16.
May 2020	• extended the maturity of repo operations to three months, the range of eligible guarantees, including mortgage bonds, and the list of entities that can have access to these operations (insurance companies, pension management companies and management companies licensed by the CNB) on April 7.

Month of adoption of the measure	Monetary policy measures
	• cut the key interest rate by 75 basis points on May 7.
May 2021	• decided to end the provision of liquidity through repo operations at three months, on May 6.

Source: author's representation based on the BIS data base (2021).

In order to maintain the stability of the financial sector, an amendment was made to the Law on the National Bank of the Czech Republic (CNB, 2020). It allowed the central bank to conduct open market operations without limits on the instruments used, maturities and market participants. A similar amendment was adopted in March 2021 (CNB, 2021), which expanded the range of open market operations carried out by the central bank, providing the possibility to execute operations with other financial market instruments and with all financial market participants. In the context in which credit institutions were no longer facing a liquidity deficit, in May 2021 the decision was taken to end repo operations at three months.

As the negative effects of the pandemic eased and the Czech Republic posted a spectacular second-quarter GDP growth of 9.1%, measures to withdraw monetary stimulus were initiated. Monetary conditions have been tightened since June 2021, when the benchmark interest rate was first raised by 25 basis points.

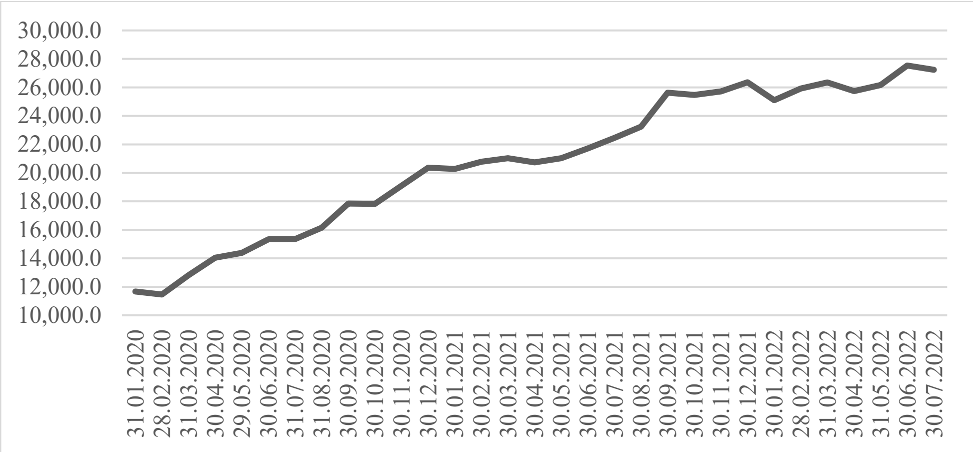
In conclusion, the Czech National Bank used a narrow range of monetary instruments to cushion the economic downturn, mostly limiting itself to reducing the reference interest rate and injecting liquidity through open market operations. Its balance sheet experienced the lowest growth rate among the states in central and eastern Europe during the pandemic, at only 4.9%, given the fact that the Czech National Bank did not initiate any asset purchase program.

4.2. The unconventional monetary policy adopted by the National Bank of Hungary

The Hungarian government declared a state of emergency on 11 March 2020 and adopted the implementation of various containment measures. Consequently, in March and April 2020, the National Bank of Hungary took a series of decisions aimed at facilitating lending to the real economy by providing consistent liquidity to the banking system. It launched a new unlimited long-term credit facility and exempted banks from complying with reserve requirements. It also launched a new lending program aimed at stimulating the financing of SMEs, worth 2.5 trillion forints. In addition, it initiated daily one-week forint currency swap auctions to maintain adequate liquidity in the banking sector. As a result, in March, the total stock of central bank swap operations increased to 2.2 trillion forints (BIS, 2021).

Moreover, the central bank relaunched in April 2020 two bond purchase schemes previously adopted in 2018 and 2019, i.e., the *Mortgage Bond Purchase Programme*, to improve the provision of long-term funding to the banking sector, and the *Bond Funding for Growth Scheme*, to boost the development of Hungary's corporate bond market. These decisions led to the growth of the assets of the National Bank of Hungary in March and April by 11.8% and 9.6%, respectively (Figure 4).

Figure 4: Total assets of the National Bank of Hungary, during the 2020-2022 period (in billions of Hungarian forints)



Source: author's representation based on National Bank of Hungary data (2022).

In addition, the monetary authority launched the *Government Security Purchase Program* on the secondary market, meant to maintain the liquidity of the government securities market. The most important monetary policy measures adopted by the National Bank of Hungary to overcome the pandemic crisis are presented in Table 2.

Table 2: Monetary policy measures adopted by the National Bank of Hungary, between March 2020 - May 2021

Month of adoption of the measure	Monetary policy measures
March 2020	• expanded the range of eligible guarantees for corporate loans; • exempted banks from complying with reserve requirements by suspending the sanctions on reserve deficiency; • initiated currency swap operations, to provide liquidity in forints; • launched the *Long-term Lending Facility*, with maturities of three, six and twelve months and three and five years, at a fixed interest rate.
April 2020	• launched the *One-week Deposit Facility*; • increased the interest rate on the credit facility by 95 basis points, and left the interest rate on the deposit facility to fluctuate depending on the liquidity situation on the market; • initiated the purchase of government bonds on the secondary market through the *Government Security Purchase Program*, in order to maintain a stable level of liquidity on the government securities market;

Month of adoption of the measure	Monetary policy measures
	• relaunched the *Mortgage Bond Purchase Program*; • launched the lending program aimed at stimulating SME financing, *Funding for Growth Scheme Go!*, worth 2.5 trillion forints; • relaunched the corporate bond purchases through the *Bond Funding for Growth Scheme*, increasing the ceiling to 450 billion forints and the maturity limit of bonds issued under the scheme from 10 years to 20 years; • gave the access of public mutual funds to the *Long-term Lending Facility* and the *Bond Funding for Growth Scheme*.
June 2020	• cut the key interest rate by 15 basis points.
July 2020	• relaxed the requirements for loans granted under the *Funding for Growth Scheme Go!* program, allowing the use of loans for investments abroad; • cut the key interest rate by 15 basis points; • the ECB and the National Bank of Hungary signed a repo line arrangement to provide 4 billion of euro liquidity to Hungarian financial institutions.
August 2020	• increased the value of weekly purchases of government bonds, from 15 billion forints to 40 billion forints, in order to expand the maturity structure of the public debt.
September 2020	• ended tenders with maturities of three, six and twelve months under the *Long-term Lending Facility* and ended public mutual funds' access to this facility; • restored the penalties related to the formation of the minimum required reserves; • reduced the remuneration of on the portion above the reserve requirement on reserve accounts, setting the interest rate related to this surplus at the overnight deposit rate; • initiated the currency swap facility, to provide foreign currency liquidity; • raised the value of the *Bond Funding for Growth Scheme* program to 750 billion forints;
October 2020	• the list of assets available under the *Government Security Purchase Program* was expanded.
November 2020	• increased the value of the *Funding for Growth Scheme Go!* by 1,000 billion forints.
December 2020	• announced the organization of currency swap auctions, to provide liquidity in euros.
January 2021	• increased the value of the *Bond Funding for Growth Scheme*, from 750 billion forints to 1,150 billion forints; • expanded the purchases of government securities, by including those with maturities of less than 10 years, thus ensuring continuous liquidity on the government securities market on the middle segment of the yield curve.
March 2021	• announced the organization of currency swap auctions, to provide liquidity in euros; • announced that it is ready to make purchases under the *Government Security Purchase Program* flexibly, without limits on individual series of securities.

Source: author's representation based on BIS data (2021).

Starting from the second quarter of 2021, Hungary's economy recovered strongly, reaching a growth rate of 17.5% compared to the previous quarter. Against this background, the central bank took steps towards the normalization of monetary policy. In June 2021, the monetary policy rate increased by 30 basis points, with further increases in the following months.

In conclusion, the National Bank of Hungary succeeded in supporting lending to the real economy, ensuring an adequate level of banking sector liquidity, and maintaining a stable level of liquidity on the government securities market. Moreover, foreign exchange swap lines were widely used to cover the liquidity requirement in forints, euros, and other currencies. Unlike the Czech Republic, due to extensive asset purchase programs, Hungary's central bank's balance sheet grew significantly in 2020, by 64%.

4.3. The unconventional monetary policy adopted by the National Bank of Poland

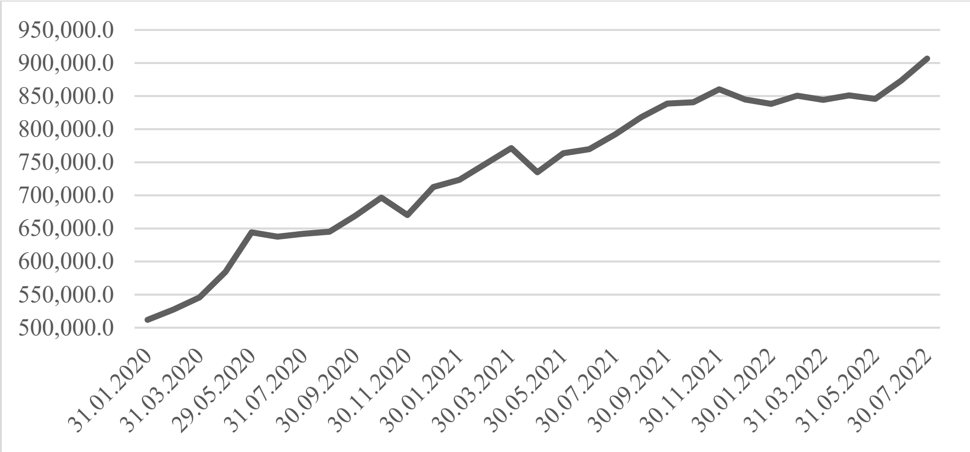
On 20 March 2020, the Minister of Health of Poland announced a state of epidemic threat in Poland, with containment measures imposed, including the closure of schools, universities, restaurants, and all non-essential retail outlets, as well as border controls and travel restrictions. Consequently, Poland recorded a substantial economic decline in the first quarter of 2020, of -7.3%.

In order to counteract the negative effects of the epidemiological situation on the economy, the National Bank of Poland took a series of decisions. Most of them were taken in the March meeting, it reduced the reference rate by 50 basis points and the minimum reserve requirement ratio for banks by 300 basis points, injected liquidity through repo operations and launched the government bonds purchases program on the secondary market. Through the large-scale purchase of government bonds as part of structural open market operations, the central bank aimed to change the long-term structure of liquidity in the banking sector, maintain liquidity in the secondary market for these securities and increase the impact of interest rate cuts on the economy real. Purchases of government bonds on the secondary market determined the growth of the central bank's assets in April and May 2020, by 7.1% and 10.3%, respectively. Under these conditions, the central bank's balance sheet grew by 40% in 2020 (Figure 5).

Also, to ensure accommodative financial conditions, the National Bank of Poland made three cuts in the monetary policy rate in 2020, namely in the March, April, and May meetings. The most important monetary policy decisions are presented in Table 3.

Unlike the central banks of the Czech Republic and Hungary, the National Bank of Poland adopted a relatively low number of decisions in the pandemic, focusing on purchases of government securities, reduction of the reference rate and repo operations, to supply liquidity of banks.

Figure 5: Total assets of the National Bank of Poland, during the 2020-2022 period (in millions of Polish zlotys)



Source: author's representation based on National Bank of Poland data (2022).

Table 3: Monetary policy measures adopted by the National Bank of Poland, between March 2020 - May 2021

Month of adoption of the measure	Monetary policy measures
March 2020	• initiated repo operations to supply banks with liquidity; • initiated the large-scale purchase of treasury bonds on the secondary market as part of structural open market operations; • cut the key interest rate by 50 basis points; • cut the minimum reserve requirement ratio of credit institutions by 300 basis points; • increased the remuneration of the required reserves from 0.5% to the level of the reference rate.
April 2020	• decided that it will purchase government securities and government-guaranteed debt securities on the secondary market, as part of structural operations; • cut the key interest rate by 50 basis points; • decided that it will offer discount loans, aimed at refinancing loans granted to businesses by banks.
May 2020	• cut the key interest rate by 40 basis points.

Source: author's representation based on BIS data base (2021).

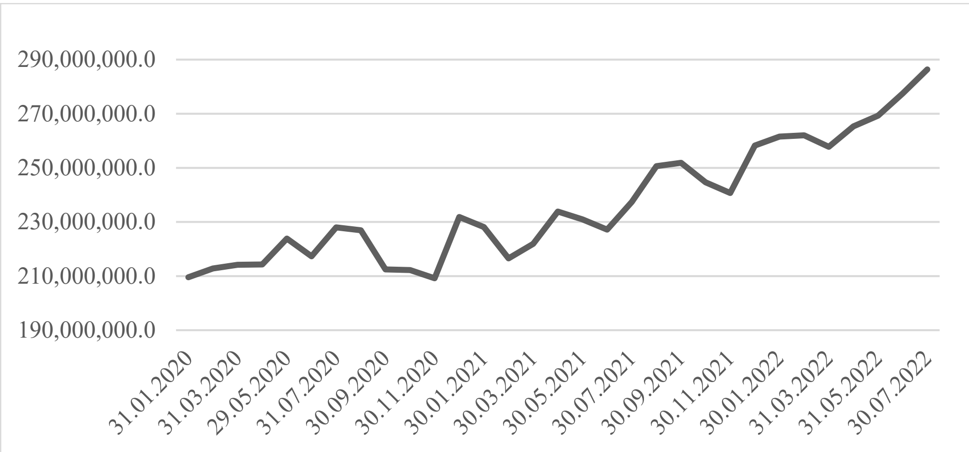
4.4. The unconventional monetary policy adopted by the National Bank of Romania

On March 16, 2020, the President of Romania signed the decree regarding the establishment of a state of emergency on the territory of Romania, with social distancing measures in place, including the closure of schools and entertainment activities, as well as travel and movement restrictions within the country. These restrictions have caused the economy to contract for four consecutive quarters, with the most severe drop recorded in March, by 7.9%.

In order to cushion the collapse of the economy, the first measures taken during the March meeting by the National Bank of Romania (NBR) aimed at reducing the reference rate by 50 basis points, initiating repo operations to supply banks with liquidity and initiating for the first-time purchases of state securities denominated in Romanian lei on the secondary market. This was followed by two further increases in the key interest rate in May and August by 25 basis points, but also in the minimum reserve requirements ratio for credit institutions' foreign currency liabilities by 100 basis points in November 2020. Also, to stabilize the foreign exchange market and to be able to have access to liquidity in euros, the NBR concluded a currency swap agreement with the ECB, in June 2020, in the amount of 4.5 billion euros.

The NBR's balance sheet grew the most in May, July, September, and December. December 2020 was the most productive in terms of purchases of government securities, increasing the NBR's assets by 10.8% compared to the previous month. The total value of the balance sheet in 2020 reached the level of 231 billion Romanian lei, increasing by 19% compared to the previous year (Figure 6).

Figure 6: Total assets of the National Bank of Romania, during the 2020-2022 period (in thousands of Romanian lei)



Source: author's representation based on National Bank of Romania data (2022).

Starting from March, the NBR injected monthly liquidity into the banking system, with the highest daily average value of the stock of repo operations reaching the level of 13,620.3 million lei, in April 2020, while the lowest average value was observed in September, by 839.3 million lei (NBR, 2020). Through the adopted measures, the central bank of Romania sought to strengthen the structural liquidity in the banking system, ensure the proper functioning of the money market and contribute to better financing of the real economy and the public sector. Table 4 presents the most important measures adopted by the NBR during the pandemic, i.e., nine official decisions.

Table 4: Monetary policy measures adopted by the National Bank of Romania, between March 2020 - May 2021

Month of adoption of the measure	Monetary policy measures
March 2020	• cut the key interest rate by 50 basis points; • decided to provide liquidity to credit institutions through repo transactions, in order to ensure the smooth functioning of the money market; • initiated, for the first time, the purchases of government securities denominated in Romanian lei on the secondary market, in order to consolidate structural liquidity in the banking system.
May 2020	• cut the key interest rate by 25 basis points and the interest rate on the deposit facility and the lending facility by 25 basis points.
June 2020	• concluded a currency swap agreement with the ECB, through which it will benefit from liquidity in euros in the amount of 4.5 billion until the end of the year.
August 2020	• cut the key interest rate by 25 basis points, the deposit facility rate by 25 basis points and the lending facility rate by 25 basis points; • the ECB and the National Bank of Romania agreed to extend the agreement to provide liquidity in euros, through a repo line, until June 2021.
November 2020	• cut the minimum reserve requirement ratio on foreign currency-denominated liabilities of credit institutions by 100 basis points.
January 2021	• cut the key interest rate by 25 basis points.

Source: author's representation based on BIS data base (2021).

In conclusion, in the fight against the negative effects of the pandemic, the NBR mainly relied on repo operations, to supply banks with liquidity, and on the reduction of the reference interest rate, to ensure favourable financial conditions. Also, the NBR initiated purchases of government securities denominated in Romanian lei on the secondary market for the first time. The decisions taken promptly by the central bank contributed to the recovery of the Romanian economy, starting from the second quarter of 2021, with an 11% increase compared to the previous quarter.

5. Conclusions

The article pursued two objectives, firstly, to analyse the CEE central banks' non-conventional monetary measures adopted during the Covid-19 crisis, i.e., from the Czech Republic, Hungary, Poland, and Romania, and, secondly, to unveil the specifics of monetary instruments used by these countries during this period. The main conclusions that emerge from this analysis are presented below.

The Czech National Bank has used a quite narrow range of monetary instruments to cushion the economic downturn, mostly limiting itself to reducing the monetary policy rate and injecting liquidity through open market operations. Its balance sheet experienced the lowest growth rate among the states in CEE during the pandemic, at only 4.9%, given the fact that the monetary authority did not initiate any asset purchase program.

Hungary used a wider set of measures than the Czech Republic, specifically, launched a series of new lending facilities, a government bonds purchase programme on the secondary market and relaunched corporate bonds purchase programmes. Moreover, it widely used foreign exchange swap lines to cover the liquidity demand in forints, euros, and other currencies. Thanks to extensive asset purchase programs, Hungary saw the largest increase in its central bank balance sheet among CEE states, at 64%.

Poland adopted a relatively low number of monetary decisions during the pandemic, focusing on the purchase of government securities, the reduction of the reference rate and on repo operations to supply banks with liquidity. Under these conditions, the central bank's balance sheet grew by 40% in 2020.

Romania mainly opted for repo operations, supplying banks with liquidity, and reducing the reference interest rate, in order to ensure favourable financial conditions. It also initiated purchases of government securities denominated in Romanian lei on the secondary market for the first time. Consequently, the NBR's assets increased by 19% in 2020.

This article definitely has limitations, it focuses only on the analysis of the unconventional monetary policy decisions taken by the central banks from the Czech Republic, Hungary, Poland and Romania between March 2020 - May 2021 and present the main differences between their set of tools. The paper does not investigate the effectiveness of this instruments on the financial markets and the real economy, which could become a target of further research.

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