EXPERIENCE OF INFLATION TARGETING IN THE CZECH REPUBLIC

Ilona Bažantová

Charles University, Faculty of Law, Curie Sq. 7, 116 40 Prague, Czech Republic

Abstract

The paper analyzes inflation targeting of the Czech National Bank ("CNB") in the context of monetary regimes and of the definition of "targeting method". It first discusses the legal authorisation of the Czech central bank, its early monetary policy in the 1990s, and the circumstances leading to the introduction of inflation targeting. In December 1997, the Bank Board of the CNB decided to change its monetary policy regime, and in January 1998 it switched to inflation targeting. At that time the CNB's inflation target was set in terms of so-called net inflation, but since 2002 it has been set in terms of inflation expressed as a change in the consumer price index. In addition to standard instruments, the CNB used foreign exchange interventions from November 2013 to April 2017 to devalue the Czech currency in an effort to increase the price level and thus achieve the inflation target, although practical experience with the use of the exchange rate as an instrument of unconventional monetary policy were limited. This paper analyzes inflation targeting and examines how successful this monetary policy strategy has been.

Key words: *central bank, CNB, monetary policy, inflation targeting, net inflation, price stability, asymmetric exchange rate commitment*

INTRODUCTION

Central banks play prominent roles in national economies as they are the main monetary policy makers. Technical discussions often concentrate on their legal framework and factual position, or in more general terms on their independence and accountability. Another frequently discussed area focuses on their practical monetary policy, monetary-policy regime, monetary instruments used and "results" of their policy reflected in basic monetary aggregates of which inflation is the most important.

The purpose of this paper is to analyse the inflation targeting of the Czech Republic's central bank, the Czech National Bank ("CNB"), on the basis of statistical data in the context of monetary regimes and of the definition of "targeting method". The article first discusses the CNB's legal powers and monetary policy at the beginning of the 1990s, the monetary crisis in May 1997 and the circumstances of the introduction of an inflation targeting regime. Starting in 1998 the Czech National Bank's inflation target was set in terms of the so-called "net inflation", but since 2002 it has been set to inflation expressed as a change in the consumer price index. In addition to standard instruments, the CNB used foreign exchange interventions from November 2013 to April 2017 to devalue the Czech currency in an effort to increase the price level and thus achieve the inflation target.

1. THE POWERS OF THE CENTRAL BANK

Since the establishment of an independent Czech state and the Czech National Bank as the central bank in January 1993, and up until the year 2002, the CNB's objective was defined in both the Article 98 of the Constitution of the Czech Republic (Constitutional Act No. 1/1993 Coll.) and the CNB Act (Act No. 6/1993 Coll. on the Czech National Bank) as the maintenance of *"currency stability"*.

The Czech National Bank itself defined currency stability in its material in 1999 as follows: "Currency stability has its internal and external elements: stability of domestic prices and the exchange rate. A monetary policy which attempts to achieve and then maintain price stability at minimal cost and without excessive fluctuations in economic output and employment is the central bank´s contribution to the creation of a pro-growth environment." (CNB 1999).

As a result of the harmonisation of Czech law with the European Community regulations, the primary objective of the central bank was changed from the maintenance of currency stability to the *"maintenance of price stability."* Section 2 (1) of Act No. 6/1993 Coll., as amended, defines the primary objective as follows: "The primary objective of the Czech National Bank shall be to maintain price stability. In addition, the Czech National Bank shall work to ensure financial stability and the safe and sound operation of the financial system in the Czech Republic. Without prejudice to its primary objective, the Czech National Bank shall support the general economic policies of the Government leading to sustainable economic growth and the general economic policies in the European Union with a view to contributing to the achievement of the objectives of the European Union. The Czech National Bank shall act in accordance with the principle of an open market economy."

Under the Constitution of the Czech Republic and under the law the CNB is fully authorised to independently implement monetary policy measures. The CNB headed by the Bank Board makes independent decisions in pursuit of the Constitutional objective of price stability (price stability or, in other words, an inflation target based on consumer inflation), and on the employment of instruments and taking of measures (a combination of them or not using them).

Section 2(2) stipulates that "[t]he Czech National Bank shall perform the following tasks:

a) set monetary policy;

b) issue banknotes and coins;

c) manage the circulation of currency, administer payments and clearing between banks, foreign banks carrying on banking activities in the Czech Republic through a branch (hereinafter "foreign bank branch") and credit unions, promote smooth and efficient operation thereof, and contribute to the safety, soundness, and efficiency of payment and settlement systems and to the development thereof;

d) supervise the activities of entities operating on the financial market (Section 44(1));

e) set macroprudential policy by identifying, monitoring, and assessing risks jeopardising the stability of the financial system and, in order to prevent or mitigate these risks, contribute by means of its powers to the resilience of the financial system and the maintenance of financial stability; where necessary, it shall cooperate with the relevant state authorities in setting macroprudential policy;

f) carry out other activities pursuant to this Act and pursuant to other legal rules."

1.1. Judgment of the Constitutional Court

As we will later show, the CNB started inflation targeting at the time when the Constitution and the CNB Act stipulated the objective of "monetary stability", with the teleological interpretation of this objective being that the central bank must use all its powers to maintain financial stability in general, and price stability forming an integral part of financial stability. A similar opinion is expressed in the judgment of the Constitutional Court No. 278/2001 Coll. and in the reasoning of the judgment. The Constitutional Court stated that the maintenance of monetary stability is a wider concept than the maintenance of price stability, and that it is not possible to restrict and reduce the scope of the primary objective of the central bank defined in the Constitution; the concepts, however, were not further defined. Currently, there is no indication in the legislation as to what methods and procedures should be used to attain the central bank's primary objective, and thus for example the use of monetary base, inflation targeting, determination of the exchange rate regime etc. is left up to *ad hoc* decisions of the Czech central bank – which is a good principle providing that the monetary policy of the central bank is successful. On the one hand it enables the bank to react to changes in the economic situation without the need for legislative amendments, but on the other any failures or hesitation on the part of the central bank leave ample room for discussions on the efficiency of monetary policy and the choice of monetary policy instruments which could then reduce the credibility of the central bank.

2. GENERAL COMMENTS ON MONETARY POLICY

The transmission mechanism of monetary policy is defined as a chain of economic dependencies through which the changes in the settings of monetary policy instruments are reflected in the changes in macroeconomic variables (Revenda 2015). The transmission mechanism begins with changes in the settings of monetary policy instruments which change the behaviour of mediating markets, which through further mediating markets result in changes in the target markets, the development of which the central bank wants to influence (Polouček 2009, pp. 67-68). The reactions of commercial banks to changes in monetary policy instruments play a role in the transmission mechanism (Polouček 2009, pp. 66-67).

The basic monetary policy regimes are:

- a regime with an implicit nominal anchor;
- money targeting (targeting based on monetary aggregate);
- exchange rate targeting;
- inflation targeting.

2.1. Regime with an implicit nominal anchor

A regime with an implicit nominal anchor involves targeting a certain nominal variable adopted internally within the central bank, without it being announced explicitly. A prerequisite for successful functioning of this regime is high credibility of the central bank, thus enabling the desired changes in inflation or inflation expectations to be achieved without explicit targets.

2.2. Money targeting

The money targeting regime focuses on the growth rate of a chosen monetary aggregate. It is based on the finding that in the long term, price growth is affected by money supply growth. A problem lies, however, in choosing an appropriate monetary aggregate to target that is best able to forecast inflation.

Given the current environment of financial innovation, market computerisation, and globalisation, the relationship between monetary aggregates and the price level is becoming ever weaker. Furthermore, the central bank may not be able to manage the selected monetary aggregate with sufficient precision.

2.3. Exchange rate targeting

Under the exchange rate targeting regime, the central bank tries to ensure nominal exchange rate stability vis-à-vis the currency of a so-called anchor country, which is credible and whose currency is stable, via interest rate changes and direct foreign exchange interventions, thereby "importing" price stability from the country. Maintaining the exchange rate requires an appropriate economic policy mix ensuring a low inflation differential vis-à-vis the anchor country, a sufficient level of international reserves, and the maintaining of the country's competitiveness and overall credibility, including its institutional and legislative framework and political stability. One of the major disadvantages of the regime is the loss of monetary policy autonomy. Countries with high inflation or an unstable price policy and not very credible central bank may choose the so-called Currency Board, an absolute commitment to maintain a fixed exchange rate to a currency and not having its own monetary policy (Čihák & Holub 2000).

2.4. Essence of inflation targeting

The essence of inflation targeting is the pursuit of the primary objective i.e., price stability (Bernanke & et al. 2001, Svensson 1999, Revenda 2015). Inflation targeting differs from monetary targeting mainly in the lack of a mediating criterion, meaning that the central bank may influence the target through an operative criterion, i.e., influencing the short-term interest rate. The inflation target is usually set as a value or an inflation band and the central bank tries to achieve an inflation rate close to this target. It is necessary to point out, however, that the central bank under certain circumstances does not try to achieve the inflation target at any cost and tolerates a temporary deviation. Inflation targeting involves adopting and announcing an inflation target and taking monetary policy measures on the

basis of inflation forecasts. The monetary policy measures include primarily decreasing or increasing interest rates, although the impact of such changes on inflation is delayed. An important precondition of inflation targeting is having an open economy so that the entities in the economy can make decisions assuming that the inflation target will be attained.

Inflation targeting is a midterm instrument using an inflation forecast and a public announcement of the inflation target or a sequence of targets. In its decision-making, the Bank Board assesses the latest developments in inflation in comparison to the forecast and evaluates the risks of non-fulfilment of this forecast. The evaluation is followed by a vote on changes in the settings of monetary policy instruments. By changing the settings the central bank seeks to offset inflationary or disinflationary pressures which might deviate or currently are deviating inflation from the inflation target set by the central bank.

3. THE CZECHOSLOVAK AND (LATER) THE CZECH CENTRAL BANK AND ITS MONETARY POLICY BEFORE THE INTRODUCTION OF INFLATION TARGETING

In the early 1990s the central bank primarily used direct monetary policy instruments, in particular limits on loans, interest rate ceilings, and refinancing loans (Vencovský 2003, pp. 180-181). A fixed exchange rate for the *koruna* (CZK) was introduced as the new exchange rate regime and after three gradual devaluations the *koruna* exchange rate was defined in relation to the US dollar at 28 CZK to 1 USD. The main reason consisted in the fact that the fixed exchange rate represented a nominal anchor for wages, prices, and budgets. Other arguments supporting the introduction of a stable exchange rate included the importing of price stability thanks to maintaining a fixed exchange rate and the stabilisation of inflation expectations leading to easier economic calculation in the transition from a centrally planned economy to a market economy (Vencovský 2003, p. 183).

Thanks to positive monetary developments in 1992 it was possible to abandon the restrictive monetary policy. The central bank stopped using directive methods and replaced them with indirect instruments, different rates were applied to minimum reserves for sight deposits and for term deposits, and loan interest rate ceilings were cancelled, as were the limits on loans. Open market operations became the new instrument used by the central bank. The monetary policy regime chosen was a monetary transmission mechanism in a modified form: the role of operative criterion was assigned to non-borrowed reserves and the mediating criterion was M2 monetary aggregate. Through this transmission mechanism the central bank pursued the objective of monetary stability.

Since the division of the Czechoslovakia into two new successor states and the establishment of the Czech National Bank in 1993, only indirect instruments of monetary policy have been used. The new strategy of the CNB was based on two factors: on the fixed exchange rate of *koruna* and on the adequate development of a monetary aggregate. The monetary policy controlled the development of a monetary aggregate in line with the monetary base and M2 as the basic aggregate. This was one of the few practical inspirations from the monetary policy of the *Bundesbank* (Bažantová 2005, p. 143) otherwise the central bank followed the recommendations of international monetary institutions – mainly the International Monetary Fund. The monetary base was controlled by means of open market operations, refinancing credit operations, and the rediscount of bank negotiable debt instruments (in October 1995 a two-week repo rate was introduced for so-called repurchase ("repo") operations used by the central bank to absorb surplus liquidity from commercial banks). The CNB did not pay any interest on the minimum reserves of banks. The exchange rate of the *koruna* was tied to only two currencies (65 % Deutsche Mark and 35 % US Dollar) instead of the original basket of five currencies (USD 49.07 %; DEM 36.15 %; ATS 8.07 %; FRF 2.92 %; CHF 3.79 %) and it had a fixed exchange rate with a narrow band of ± 0.5 % with the initial level from the end of 1990 of 28 CZK to 1 USD (Vencovský 2003, pp. 182-183).

From the second half of 1993 to 1995 monetary instruments were set to stabilisation mode (perhaps with respect to the price level we could speak about a slightly expansionary policy). From 1994 to the beginning of 1996, the inflation rate was around 10 %, which was acceptable to the entities in the economy, with a low level of unemployment of around 3 %, economic growth of 5 to 6 % of GDP and

a balanced state budget. Since 1994 the current account of balance of payments of the Czech Republic was in deficit of 2 to 3 % of GDP. (For the history of the settings of basic monetary policy instruments see CNB 2017).

In the mid-1990s, the economy started "overheating" (with an imbalance of savings and investments and a rise in the current account deficit to 7.6 % of GDP) and the Czech Republic experienced a massive influx of foreign capital. In 1995 the surplus of financial account of the balance of payments was approximately CZK 223 billion, which represented approximately 18 % of GDP.

In October 1995, when the new Foreign Exchange Act No. 219/1995 Coll. became effective, the *koruna* became a freely convertible currency with a fixed exchange rate which engendered a further inflow of short-term capital using the high interest rate differential.

In the light of global financial and monetary crises, including the Czech crisis, it is possible to have certain doubts as to such an early introduction of full convertibility of the *koruna* and trading on international markets – at a minimum the restrictions on movement of speculative capital (the "other investments" item on the financial account of the balance of payments) should have been kept in place. A similar crisis to the Czech one was experienced by Mexico in December 1994 when Mexico was forced to shift from a fixed to floating exchange rate; Asian monetary crises hit in June 1997.

According to the author, the main mistake in monetary policy made by the central bank in 1996 was keeping the fixed exchange rate. In February 1996, the exchange rate fluctuation band was expanded to ± 7.5 % and in summer the monetary policy was tightened (discount rate increased from 9.5 to 10 % and obligatory minimum reserves were raised from 8.5 to 11.5 % of primary deposits), yet all this was not sufficient in an open economy with a weak banking sector. The fixed exchange rate of the currency in liberalised capital flows had to be maintained by means of foreign exchange interventions of the central bank, but such interventions increased the money supply and the economy was unable to efficiently absorb the excessive liquidity, so the central bank again had to resort to the so-called monetary sterilisation which resulted in pressures to increase the interest rate on deposits in CZK, which in turn attracted more short-term capital which exploited the "certainty" of the fixed exchange rate of the Czech currency (Vencovský & Půlpán 2005, pp. 389-393).

Slower economic growth at the beginning of 1997 and an external imbalance of the economy combined with political instability of the then coalition government resulted in a monetary crisis in May of that year. Speculation on the exchange rate of the *koruna* reached a peak and the *koruna* exchange rate slumped below the central point on 15th May. Neither multiple massive interventions of the CNB (amounting to approximately USD 1.5 billion) nor a dramatic increase in interest rates on the interbank market (average overnight repo rate grew up to 39 %, lombard rate to 50 %) could calm the situation and on 26th May, 1997 the CNB abandoned the fixed exchange rate regime with a fluctuation band and switched to a managed float regime without explicit determination of the band for potential interventions (Vencovský & Půlpán 2005, pp. 395-399).

Towards the end of 1997 the exchange rate stabilised at approximately 10% depreciation compared to the former central point of the exchange rate. A prudent stabilisation policy consisting in a very slow reduction of restrictions in the summer months of the 1997 would have been appropriate. However, at the end of August 1997 the central bank increased monetary restriction by raising the repo rate from 14.5 to 18.5 %.

With an unchanged constitutional and legal framework (requiring maintenance of monetary stability) since 1996, the central bank switched from a fixed exchange rate regime to a regime with a narrow fluctuation band and towards the end of the 1997, following the May monetary crisis, on its own decision abandoned the monetary exchange rate system (as well as decision-making on the basis of analysis of the monetary base, i.e., using the *ex post* method) in favour of inflation targeting (applying the *ex ante* method).

The CNB points out on its website that the shift to inflation targeting in December 1997 did not mean any change in the primary objective of the bank, but was rather only a change in the instruments used.

It is worth adding that in all countries where inflation targeting was introduced it has become the main instrument for influencing prices or price stability.

4. COMMENCEMENT OF "NET INFLATION" TARGETING

Towards the end of 1997 the central bank announced that as of 1st January 1998 it would switch to the *inflation targeting* method and that the so-called *net inflation* was chosen as the main targeting aggregate. Inflation targeting was then a new monetary instrument used only in some developed countries – at the time the method was used by Canada, New Zealand, Australia, Brazil, Chile, Great Britain, and Sweden (Šmídková & Hrnčíř 1998, Revenda 2015).

"Net inflation" was specific to the method used in the Czech Republic and was not used anywhere else. It was calculated as a price level determined by means of the consumer price index (CPI), and the price level excluded regulated prices (e.g., for rents paid under regulated leases, for residential energy, water, and sewage, for public transport, etc.) and the impact of indirect taxes.

Inflation targeting consisted in the announcement of forecast for inflation within a certain range by the central bank and the commitment of the bank to use monetary policy instruments in order to achieve the announced target. The inflation target and the appropriate monetary instruments to reach the target did not have to be applied dogmatically: in the case of exogenous shocks exceptions to the achievement of the inflation target would apply. In addition to the medium-term target for the year 2000 within a range of 3.5 to 5.5 % of net inflation (the actually achieved net inflation was 3 %), a short-term inflation target was announced for the year 1998 at the rate of 5.5 to 6.5 % of net inflation. Actual net inflation of 1.7% at the end of 1998 proved that the central bank's policy caused a shock restriction. Even in the years that followed the central bank "undershot" its inflation targets and actual inflation was lower than the set inflation target. Already in 1998, A. Mandel drew attention to the unnecessarily stringent restrictive policy of the central bank (Mandel 1998).

Table 1. The CNB´s inflation targets set in terms of "net inflation"

Year	Target level	Target month	Set in
1998	5.5 % – 6.5 %	December 1998	December 1997
1999	4 % – 5 %	December 1999	November 1998
2000	3.5 % – 5.5 %	December 2000	December 1997
2001	2 % – 4 %	December 2001	April 2000
2005	1 % – 3 %	December 2005	April 1999

Source: www.cnb.cz

Table 2. Inflation rate (as an increase in average annual CPI) in the Czech Republic between 1998 and 2004

Year	1998	1999	2000	2001	2002	2003	2004
Inflation %	10.7	2.1	3.9	4.7	1.8	0.1	2.8

Source: Czech Statistical Office 2017

The economic recession which began in early 1997 worsened at the end of the year due to a rapid and unnecessary disinflationary policy implemented by the central bank until 1999, monetary restrictions, and a tightening of the conditions for operation in the banking sector. An increase in the capital adequacy of commercial banks, stricter requirements for using immovable property as security for

loans, and relatively high interest rates (with respect to the recession and low inflation) caused commercial banks to stop lending to the business sector even though they had surplus liquidity, which was sterilised by the central bank within the framework of its disinflationary policy. This situation, known as a *credit crunch*, further suppressed economic activity, because businesses were highly dependent on the bank loans for historical reasons including the pre-transformation loans for "continuously fluctuating stock" and the manner of Czech privatisation. The economy was unable to restore GDP growth until 2000.

The main monetary instrument used within the inflation targeting regime was open market operations carried out via repo operations. On 12th July, 2001 the CNB started paying the two-week repurchase rate of interest on banks' minimum reserves. Since October 1999, the minimum reserves have been on a comparable monetary level (2 %) to the euro area countries and are no longer effective as a monetary policy instrument. At present they serve rather as "reserves" to ensure smooth interbank payments carried out by the central bank via the CNB Clearing Centre.

5. TARGETING CONSUMER PRICE INFLATION

In 2002 the inflation targeting regime was changed: instead of net inflation the CNB began targeting headline inflation measured on the basis of the CPI, and instead of meeting targets at the end of the relevant calendar year the bank began targeting inflation as an unconditional forecast in a linear (sliding) time band of one to one and a half years. Initially the inflation target was set as a band, but since 2006 it has been set as a point target with a tolerance of ± 1 %.

Table 3. Target band set in terms of headline consumer price inflation for the January 2002 – December 2005 period

	Month	**Target level**	**Target month**	**Set in**
Band starts	January 2002	3 % – 5 %	January 2002	April 2001
Band ends	December 2005	2 % – 4 %	December 2005	

Source: www.cnb.cz

The former so-called conditional inflation forecast applied to certain monetary policy instruments, primarily interest rates. In the case of a change in the rates, the forecast applicable up to that moment was "cancelled" and a new conditional forecast was produced and announced. The change in the method of forecasting and expressing the target as headline inflation was supposed to increase the success of forecasts of inflation development and their transparency to a wider professional public.

The CNB target of 3 % inflation (rise in the CPI) was announced in March 2004 and became effective in January 2006. It was set slightly above the level of price stability declared by the ECB for the euro area, and above the level of inflation targets of the majority of central banks of developed countries (most often 2.0 % to 2.5 %). The setting of the inflation target reflected the specific needs of a transformation economy converging towards the developed countries (Chytilová 2009, Szyszko 2017).

In March 2007 the CNB announced a new inflation target effective as of January 2010 as a year-on-year rise in the CPI amounting to 2 % and this target has been in effect until now irrespective of the economic cycle, external shocks, etc.

Table 4. Inflation rate (as an increase in average annual CPI) in the Czech Republic between 2005 and 2016

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Inflation %	1.9	2.5	2.8	6.3	1.0	1.5	1.9	3.3	1.4	0.4	0.3	0.7

Source: Czech Statistical Office 2017

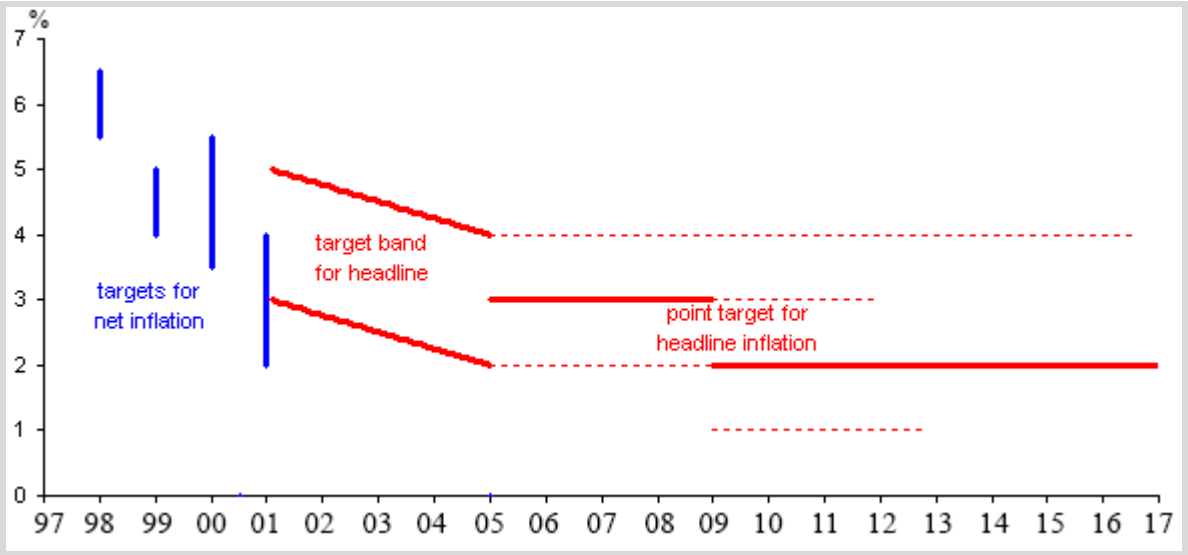
In terms of hitting the inflation targets, the CNB for the most part undershot the set inflation target (the inflation targets were set higher). In the period from 2001 to 2006, i.e., during the inflation band phase, actual inflation was lower than the inflation band and the same is true of the phase during which the inflation target was set as a point value. Undershooting of the targets could be caused by many factors. One of them is CNB's monetary policy itself, i.e. "slow process of lowering the repo rate particularly at the start of inflation targeting. Another reason can be seen in the introduction of the net inflation concept in first years. It was aimed at specifying targets in a way to lower likelihood of issing the target from reason out of a CNB's control and thus limit negative impact on credibility of this new monetary framework. The trade off was that CPI inflation was not directly anchored, as the net inflation concept was less transparent for general public." (Chytilová 2009, p. 14).

Failure to meet the inflation target is usually caused by unexpected economic shocks. If actual inflation differs from the set inflation target, the CNB has a duty to explain the event to the public and to ensure a gradual return of actual inflation to the set target.

The Czech National Bank defined a set of escape clauses, whose effect cannot be influenced by the bank's measures (CNB 2001):

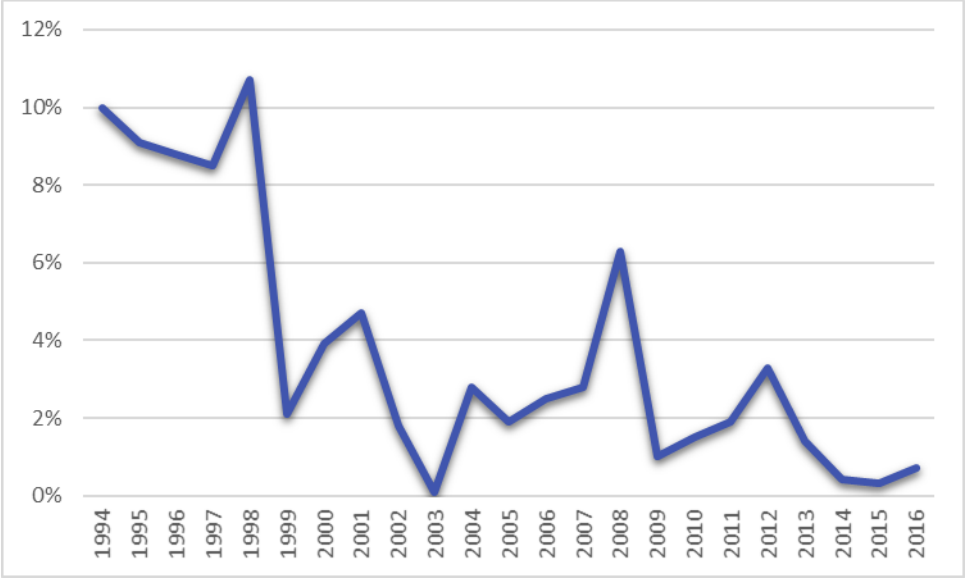
- major deviations in world prices of raw materials, energy-producing materials, and other commodities from the CNB forecast;
- major deviations of the *koruna*'s exchange rate from the CNB forecast that are not connected with domestic economic fundamentals and domestic monetary policy;
- major changes in the conditions for agricultural production having an impact on agricultural producer prices;
- natural disasters and other extraordinary events having cost and demand impacts on prices;
- changes in regulated prices whose effects on headline inflation would exceed up to 1.5 percentage points;
- dramatic adjustments to indirect taxes, or possibly unpredictable price shocks caused by the acceptance of EU standards.

Figure 1. The CNB's inflation targets in 1998 – 2017



Source: www.cnb.cz

Figure 2. The average annual inflation rate in 1994 – 2016



Source: Czech Statistical Office 2017

6. CNB'S MONETARY POLICY INSTRUMENTS AND INFLATION TARGETING

After targeting the basic aggregate using a monetary policy regime the central bank, as the monetary authority, chooses and applies the so-called monetary policy instruments.

The following are the basic monetary policy instruments recognized by the CNB:

1. Open market operations;
2. Automatic facilities;
3. Extraordinary facilities;

4. Minimum reserves;
5. Foreign exchange interventions.

The most commonly used instruments in the inflation targeting regime are open market operations, and automatic, or possibly extraordinary, facilities via setting interest rates – the repo and discount rates, and in exceptional cases the Lombard rate (for more see CNB 2017).

6.1. Repo operations

Repo operations represent the main monetary instrument in the Czech Republic. Let us briefly outline this instrument to highlight its limits in the circumstances of surplus liquidity or in the case that the interest rates are set to the so-called "technical zero" level. Repo operations take the form of tenders. In such operations the CNB accepts surplus liquidity from other banks and in return transfers eligible securities to them as collateral. The two parties agree to reverse the transaction on the maturity date, when the CNB as borrower repays the principal of the loan to the creditor, which is the bank providing surplus liquidity. The principal is increased by the agreed interest (set repo interest rate). The creditor bank returns the collateral (the securities) to the CNB. As the basic duration of these operations is 14 days, this policy is set as a two-week repo rate (2W repo rate).

Repo operations serve mainly to absorb surplus liquidity from the banking sector. The CNB conducts variable rate tenders. The declared 2W repo rate serves as the maximum limit rate, that is, the maximum interest which banks may receive. The bids are ranked so that those with the lowest interest rate are accepted by the CNB as having priority. The bids are accepted up to the level of the predicted liquidity surplus for the day. The tenders are settled using the so-called American auction procedure. If the volume ordered by the banks exceeds the predicted surplus, the CNB reduces the bids at the highest rate pro rata. Repo tenders are usually announced three times a week. At a given time banks submit their orders for the required interest rate (repo rate). The minimum acceptable volume is CZK 300 million followed by multiples of CZK 100 million.

6.2. The situation of zero interest rates

The CNB defined its current long-term inflation target at 2 % (with accepted oscillation of 1 %). Before 2008, the CNB as well as other European central banks and the ECB had set their monetary policy instruments to "fight" against inflation, to deal with inflationary pressures related to economic growth. With the progressing monetary and debt crisis and recession of the national economy, the interest rates and settings of the main monetary policy instruments were falling.

The main interest rate of the CNB (2W repo rate) was below 1 % for a long time, and since November 2012 it has been set to "technical zero" amounting to 0.05 %. This is sometimes referred to as hitting the "Zero Lower Bound" (McCallum 2000). Interest rates started declining with the collapse of the US investment bank, Lehman Brothers, in September 2008 and with the global financial and debt crisis, and it has not yet been fully overcome in Europe.

As a result, CNB faced a situation in which it was not possible to further decrease interest rates and the so-called conventional monetary policy did not have effective instruments that could be used for deflationary situation. The monetary policy instruments previously used are designed for disinflationary policy and they simply do not work the other way round against deflationary pressures.

It is generally known that foreign exchange interventions against own currency, i.e., depreciation, or devaluation of local currency, are used as an instrument of pro-export policy. Foreign exchange interventions causing a devaluation of currency used in this case to prevent the decline of the local price level is not a conventional (standard) instrument of monetary policy.

Table 5. The history of the 2W Repo Rate (at year-end in %)

1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
11.3	12.4	14.75	7.5	5.25	5.25	4.75	2.75	2.0	2.5	2

2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
2.5	3.5	2.25	1.0	0.75	0.75	0.05	0.05	0.05	0.05	0.05

Source: www.cnb.cz

6.3. Foreign exchange intervention and unilaterally fixed exchange rate as the main factor of inflation targeting in the period between 11/2013 – 4/2017

Foreign exchange interventions are massive purchases or sales of foreign currencies for Czech *koruna* carried out by the central bank on the foreign exchange market. Foreign exchange interventions are not a commonly used instrument in an inflation targeting regime, they are normally used as pro-export support for the national economy.

On 7th November, 2013 the CNB Bank Board decided by a narrow majority of votes to use a fixed exchange rate as a standard monetary policy instrument and to commence foreign exchange interventions to maintain the exchange rate of CZK 27 or more for EUR 1 at the starting position of CZK 25.785 for EUR 1 (on 6 th November, 2013). These were the first monetary interventions by the CNB in 11 years. The unilaterally fixed exchange rate of CZK to EUR and interventions were justified as a means to prevent imminent deflation, or a deflation trap, and as an effort to meet the inflation target of 2 % of CPI (CNB 2013). Theorists use the term deflation trap in the case of simultaneous deflation and long-term recession (economic stagnation) when the central bank has no instruments to suppress deflation. According to the CNB, weakening the exchange rate of the *koruna* was supposed to bring an increase in import prices and in turn boost the overall price level.

Some economists approved the fixed exchange rate (Franta & Holub & et al. 2014, Tomšík 2015). The goal, the inflation above 2 %, was reached: in June 2017 the average annual inflation rate was 2.3 % (Czech Statistical Office 2017). Devaluation of the Czech currency helped the Czech exporters, it helped to boosting economic growth. K. Dyba (2015) had an opinion when a state like the Czech republik is producing under its natural level (below the highest possible production level for the long term), expansive monetary policy (pumping money into the system,) can help to restore the natural level at high pace.

The Bank Board made numerous controversial decisions according to many critical voices (i.e. Mandel & Brůna 2014, Kovanda 2015 and 2017, Hurník & Vávra 2016, Šichtařová 2017, Zamrazilová 2017).

One of the decisions criticised was determining the period until which the exchange rate would be fixed and the interventions would continue. This period was prolonged several times, with the prolongations being announced well in advance, and the CNB continued the interventions up until April 2017 despite the fact that the economy was no longer below its potential (and in the first half of 2017 the inflation level exceeded 2 %). This played into the hands of speculators and resulted in an enormous increase of foreign exchange reserves in euro; the exchange rate of the euro to the *koruna* will fall and the CNB will report a loss (Tůma & Hurník & Vávra 2017). When previously the exchange rate was fixed and maintained by foreign exchange interventions, the level of foreign exchange reserves represented 20 % of GDP, but after the end of the interventions it represented almost 70 % of Czech GDP, which in absolute figures is more than CZK 3.355 trillion (the end of period – April 30, 2017 – it was CZK 3,355 256.9 mil.)

The CNB purchased euro for CZK 2 trillion (2 000 billion), this is the amount of Czech currency printed by the CNB and spent on foreign exchange interventions (CNB 2017b). The euros are now

held in foreign exchange reserves and the amount paid in CZK is held by financial investors (Janáček 2017). A large proportion of investors will want to sell their crown assets, the CZK exchange rate will fluctuate for a long time.

Another decision that could be discussed is the inflation target of 2 % at the time of moderate economic growth as well as the targeting of the consumer price index (CNB's inflation targeting uses the CPI which does not take into account some sectors such as the immovable property market, stock market, etc.). The CNB did not use the escape clauses in inflation targeting: deflation was, among other things, caused by a decline in oil prices, which is an external factor that would not lead to a deflation trap and on the contrary would help to make products cheaper. Neighboring countries managed deflation even without central bank interventions.

Even though devaluation of the domestic currency benefited exporters, it was detrimental to importers and consumers (imported products were more expensive) and the renewal of machinery and technical equipment imported from abroad in the business sector, as well as for example the health care sector, slowed down for three years.

"The most interesting aspects of the CNB's experience also include the debate on how to use the exchange rate as a monetary policy instrument at the ZLB [Zero Lower Bound] and on how transparent it should be. This debate eventually resulted in the choice of a publicly declared, one-sided exchange rate commitment, i.e. the exchange rate level below which the CNB will not let the currency appreciate, using potentially unlimited foreign exchange interventions to this end. [...] The CNB's experience also reveals that the use of this type of instrument may meet with strong criticism from experts and the general public, criticism that will force the central bank to explain even those elements of the monetary policy regime which are normally regarded as axiomatic (such as the definition of price stability, the inflation target level, the costs of deflation caused by insufficient demand and the functioning of the monetary policy transmission mechanism). This debate was unpleasant from the point of view of the short-term perception of the central bank's activities by the public and forced the CNB to change its communication procedures towards shorter delays following monetary policy meetings, more direct communication with various groups in society and stronger institutional communication relative to presentation of the Bank Board members' individual views." (Franta & Holub & et al. 2014, p. 44). Hába (2016) focused on impact of central bank's oral commentaries on asset prices, i.e. verbal interventions: only comments made by the CNB's governor proved to be significant, leading to higher volatility of the exchange rate.

7. CONCLUSION

The monetary policy strategy based on inflation targeting is designed for economic growth combined with inflationary pressures. Announcing an inflation target without an intermediate or a second (additional) factor should theoretically save on the costs of monetary policy, increase the effectiveness of monetary instruments, and increase transparency.

The major issue is the definition and measurement of the targeted variable. In the transition economy of the Czech Republic at the end of the 1990s the new construction of "net inflation" was used, which is an indicator of the consumer price index excluding regulated prices and tax impact. A target defined in this way was incomprehensible even for the specialist audience and the Czech National Bank shifted to an inflation target based on the CPI. The CPI does not reflect changes in the prices of financial instruments on financial markets and in the case of a real estate bubble, for example, a monetary instrument with opposite effect, i.e., a restrictive instrument, may be required. The CPI also does not reflect changes in the markets of intermediate products, industrial goods, and raw materials. Thus the long-term (multiple) setting of the target to 2 % irrespective of the economic cycle is an issue. Defining escape clauses, or exceptions when the inflation target does not have to be achieved, is not always the solution.

Inflation targeting uses standard monetary policy instruments designed for periods of economic growth and possible inflationary pressures. There are no models available for non-standard monetary

situations. Long-term harmful deflation developing into a deflation trap of the Japanese type is not typical for Europe, however the short-term deflation model caused by external factors with a high multiplier effect (typically a decline in oil prices and other raw materials) is not sufficiently discussed and explained (including in the international literature).

From November 2013 to April 2017, the Czech National Bank applied a non-standard monetary measure: the CNB used foreign exchange interventions to devalue the Czech currency in an effort to increase the price level and thus achieve the inflation target. The CNB unilaterally fixed the Czech currency to the euro (EUR 1 = CZK 27 or more); the total cost of the interventions to maintain the exchange rate exceeded CZK 2 trillion, which is approximately a half of the annual GDP of the Czech Republic. Already the Czech monetary crisis of 1997 showed that maintaining a fixed exchange rate for the currency in the long term without enormous expenditures for foreign exchange interventions is impossible.

According to statistical data, the CNB usually "undershot" its target, i.e., actual inflation was lower than the targeted one, which caused excessive restriction of monetary policy.

How a monetary authority should behave when its announced long-term model and inflation target prediction diverge from economic reality is open to debate. The CNB chose to save its reputation and credibility (by complying with the period for which the fixed exchange rate had been announced) – the credibility of inflation targeting and support of exporters over the premature cancellation of the fixed exchange rate and the mitigation of the harmful economic effects on import and consumers.

ACKNOWLEDGEMENT

This article forms part of the Progres Q04 research project of Charles University, Faculty of Law.

REFERENCES

Bažantová, I. 2005, *Centrální bankovnictví v české historii po současnost: Institucionální pohled.* [Central Banking in the Czech history to the present: Institutional View] Praha: Studie Národohospodářského ústavu Josefa Hlávky 2005, č. 4.

Bernanke, B. S. & Laubach, T. & Mishkin, F. S. & Posen, A. 2001, *Inflation Targeting: Lessons from the International Experience*. 2 ed. Princeton: Princeton University Press.

CNB 1999, *Dlouhodobá měnová strategie*. [Long-term monetary strategy]. Dokument projednaný v Bankovní radě ČNB dne 8. 4. 1999. <http://www.cnb.cz/cs/menova_politika/strategicke_dokumenty/download/d_menova_strategie.pdf>

CNB 2001, *Institut výjimek z plnění inflačního cíle*. [Escape Clauses Pertaining to the New Inflation Target]. <http://www.cnb.cz/cs/menova_politika/zpravy_o_inflaci/2001/2001_cervenec/boxy_a_prilohy/mp_zpinflace_prilohy_c_01_cervenec_p1.html> in Czech or in English <http://www.cnb.cz/en/monetary_policy/inflation_reports/2001/2001_july/boxes_annexes/zpinflace_01_july_a1.html>

CNB 2013, *Official press release of CNB*, 7 Nov 2013. <http://www.cnb.cz/en/public/media_service/press_releases_cnb/2013/20131107_monetary_policy_decision.html>

CNB 2017, *The main instruments of monetary policy*. <http://www.cnb.cz/en/monetary_policy/instruments/index.html>

CNB 2017b, *International reserves*. <http://www.cnb.cz/en/statistics/bop_stat/international_reserves/drs_rada_en.htm>

Chytilova, H. 2009, *Efficiency of Inflation Targeting in Transition Countries. The Czech Republic´s Experience with IT Regime*. VDM Verlag.

Czech Statistical Office 2017, *Inflation, Consumer Prices*. <https://www.czso.cz/csu/czso/inflation_consumer_prices_ekon>

Čihák, M. & Holub, T. 2000, Měnový výbor: cesta z dilemat centrálního bankovnictví v ČR? [Curency Board: The Way of Dilemmas of Central Banking in the Czech Republic?] *Bankovnictví,* 2000, no. 6, pp. 25-28.

Dyba, K. 2015, Devizová intervence patř do arzenálu monetární politiky. [Foreign exchange intervention belongs to the monetary policy arsenal]. Brůna, K. & Dyba, K. & Klaus, V. & et al., *Spor o měnovou politiku v kontextu devizových intervencí* [Monetary policy dispute in the context of foreign exchange interventions]. Praha: IVK 16/2015, pp. 27-32.

Franta, M. & Holub, T. & Král, P. & Kubicová, I. & Šmídková, K. & Vašíček, B. 2014, The exchange rate as an instrument at zero interest rates: The case of the Czech Republic. *Research and Policy Notes*, 3/2014, Praha: CNB.

Hába, S. 2016, Verbální intervence ČNB: reaguje devizový kurz na slova bankovní rady? [Czech National Bank verbal interventions: Does the exchange rate react to words from CNB Bank Board?] *Politická ekonomie,* vol. 64, 2016, no. 4, pp. 405-419. DOI: <https://doi.org/10.18267/j.polek.1078>

Hurník, J. & Vávra, D. 2016, ČNB plní inflační cíl: vážně díky! [The CNB fulfills the inflation target: really thanks!] *Hospodářské noviny*, December 28, 2016.

Janáček, K. 2017, Investoři se koruny ještě zbavovat nebudou [Investors will not get rid of the crown yet]. *Journal E15*, 20 July 2017. <http://www.e15.cz/>

Kovanda, L. 2015, Zkázonosná deflace je historickou anomálií. [Devastating deflation is a historical anomaly]. Brůna, K. & Dyba, K. & Klaus, V. & et al., *Spor o měnovou politiku v kontextu devizových intervencí* [Monetary policy dispute in the context of foreign exchange interventions]. Praha: IVK 16/2015, pp. 33-40.

Kovanda, L. 2017, Intervence ČNB pokřivily českou ekonomiku [CNB interventions have distorted the Czech economy]. *Roklen24*, 27 April 2017. <http://roklen24.cz/>

Mandel, M. 1998, Cílování inflace a peněžní zásoby při exogenních šocích (komparace z pohledu modelu AS-AD-NX). [Inflation and monetary targeting with exogenous shocks (A Comparison from the perspective of the AS-AD-NX Model)]. *Finance a úvěr*, vol. 48, 1998, no. 4, pp. 237-251.

Mandel, M. & Brůna, K. 2014, Ke sporu o depreciaci koruny a intervence ČNB. [To the dispute about the depreciation of the Czech koruna and the intervention of the CNB]. *Bankovnictví*, vol. 2014, no. 1-2, p. 34-37.

McCallum, B., 2000, Theoretical Analysis Regarding a Zero Lower Bound on Nominal Interest Rates. *Journal of Money, Credit and Banking*, 2000, vol. 32, no. 4, pp. 870-904.

Polouček, S. & et al., 2009, *Peníze, banky, finanční trhy*. [Money, banks, financial markets.] Praha: C. H. Beck.

Revenda, Z. 2015, *Centrální bankovnictví*. [Central Banking] 3. ed., Praha: Management Press.

Svensson, L. E. 1999, Inflation targeting as a monetary policy rule. *Journal of Monetary Economics*, vol. 43, no. 3, June 1999, pp 607-654.

Szyszko, M. 2017, Central Bank's Inflation Forecast and Expectations. A Comparative Analysis. *Prague Economic Papers*, Vol. 26 No. 3, pp 286-299. DOI: <https://doi.org/10.18267/j.pep.614>

Šichtařová, M. 2017, Jak ze zdravé ekonomiky vyrobit ohroženou. [How to make a healthy economy threatened]. Next Finance, 23 June 2017, <http://www.nextfinance.cz/>

Šmídková, K. & Hrnčíř, M. 1998, Přechod na strategii cílování inflace. [Transition to the Inflation Targeting Strategy]. *Finance a úvěr*, vol. 48, 1998, no. 4, pp. 205-222.

Tomšík, V. 2015, Kurzový závazek jako nástroj měnové politiky ČNB v pasti likvidity. [Currency obligation as a tool of monetary policy CNB in the trap of liquidity]. Brůna, K. & Dyba, K. & Klaus, V. & et al., *Spor o měnovou politiku v kontextu devizových intervencí* [Monetary policy dispute in the context of foreign exchange interventions]. Praha: IVK 16/2015, pp. 81-96.

Tůma, Z. & Hurník, J. & Vávra, D., 2017, Intervence a ztráta České národní banky. *Roklen24*, 3 April 2017, <http://roklen24.cz/>

Vencovský, F. 2003, *Vzestupy a propady československé koruny*. [The rise and fall of the Czechoslovak crown] Praha: Oeconomia.

Vencovský, F. & Půlpán, K. & et al. 2005, *Dějiny měnových teorií na českém území*. [History of monetary theories in the Czech territory] Praha: Oeconomica.

Zamrazilová, E. 2017, Polemika: Pomohly intervence ČNB ekonomice? NE. [Polemic: Did CNB interventions help the economy? NO]. *Hospodářské noviny*, 7 April 2017.