Czech University of Life Sciences Prague

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Diploma Thesis

Monetary policy of the Czech National Bank - Currency interventions against EURO and its impact on the Czech economy

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

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Business Administration

Thesis title

Monetary policy of the Czech National Bank – Currency interventions against EURO and its impact on the Czech economy

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Objectives of thesis

Main objective of this thesis is to analyse current monetary policy of the Czech National Bank in particular its ongoing foreign exchange interventions against EURO and its impact on the main macroeconomic figures of the Czech economy. Among other objectives of this thesis belongs the analysis of positive and negative effects of currency interventions on the Czech economy and estimation and suggestions for future developement.

Methodology

Analysis of literature and relevant information sources

Search and analysis of statistical figures

Quantitative and qualitative evaluation and interpretation of statistical figures and obtained data

Observation, description, interpretation, comparison and analysis of gained data

The proposed extent of the thesis

60 – 70 pages

Keywords

Foreign exchange market, Inflation, Exchange rate, Export, Import, Balance of payment, National Bank, Deflation, Depreciation, Monetary policy

Recommended information sources

HOLMAN, Robert. Makroekonomie: středně pokročilý kurz. 2. vyd. Praha: C.H. Beck, 2010, xiv, 424 s. Beckovy ekonomické učebnice. ISBN 978-80-7179-861-3.

HUMPAGE, Owen F. The Limitations of Foreign-Exchange Intervention: Lessons from Switzerland. Federal Reserve Bank of Cleveland, Number 2013-13, 18.10.2013

JÍLEK, Josef. Peníze a měnová politika. 1. vyd. Praha: Grada, 2004, 742 s. Finance (Grada). ISBN 80-247-0769-1.

KLAUS, Václav. Byla deflace opravdu hrozbou?. Vyd. 1. Praha: Institut Václava Klause, 2014, 44 s. Publikace (Institut Václava Klause). ISBN 978-80-87806-04-3.

LÍZAL, Lubomír – SCHWARZ, Jiří: Foreing exchange interventions as an (un)conventional monetary policy tool, BIS Papers, No. 73, 2013

MANDEL, Martin a Vladimír TOMŠÍK. Monetární ekonomie v malé otevřené ekonomice. Vyd. 1. Praha: Management Press, 2003, 287 s. ISBN 80-7261-094-5.

SARNO, Lucio a Mark P TAYLOR. The economics of exchange rates. 1st ed. Cambridge: Cambridge University Press, 2003, xii, 318 s. ISBN 0521481333.

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Declaration

I declare that I have worked on my diploma thesis titled "Monetary policy of the Czech National Bank - Currency interventions against EURO and its impact on the Czech economy" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 17.4.2016 _____

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I would like to thank doc. Ing. Mansoor Maitah, Ph.D. et Ph.D. for his advice and support during my work on this thesis.

Monetární politika ČNB - devizové intervence vůči euru a jejich vliv na ekonomiku ČR

Souhrn

Tato diplomová práce je zaměřena na monetární politiku České národní banky a na kroky které podniká v rámci snahy o udržení cenové stability a ekonomického růstu na českém trhu. Speciální pozornost je dána kurzovým intervencím, které česká národní banka zavedla na konci roku 2013, v rámci boje proti vznikajícím deflačním tlakům v české ekonomice. Tato práce mimo jiné analyzuje dopad zmíněných intervencí na české hospodářství.

Tato diplomová práce je rozdělena do dvou částí. První, teoretická část je zaměřena na analýzu role české národní banky v české ekonomice a na měnové nástroje, které používá k udržení cenové stability a ekonomického růstu, spolu s ekonomickými efekty těchto nástrojů. Dále teoretická část analyzuje teorii měnových kurzů a deflace.

Druhá, praktická část, analyzuje reálné dopady zavedených měnových intervencí na hlavní makroekonomické ukazatele české ekonomiky.

Klíčová slova: Devizový trh, Inflace, Směnné kurzy, Export, Import, Platební balance, Česká národní banka, Deflace, Depreciace, Monetární politika

Monetary policy of the Czech National Bank - Currency interventions against EURO and its impact on the Czech economy

Summary

The focus of this diploma thesis is on the monetary policy of the Czech national bank and the measures it takes to sustain the price stability and long term economic growth in the national economy. Special attention is given to the foreign exchange interventions against EURO currency that the Czech national bank introduced at the end of year 2013 in order to fight against the threat of deflation pressures. This thesis, among others, analyses the impact of those interventions on the Czech economy.

This diploma thesis is divided into two main parts. Theoretical part focuses on the general role of the national bank in the economy and the monetary policy instruments it uses to ensure price stability and economic growth along with theoretical economic effect of those instruments. At the end of the theoretical part, this thesis analyses the theory of exchange rates and deflation.

Practical part of this thesis analyses the real impact of the foreign exchange interventions on the main macroeconomic indicators in the Czech economy.

Keywords: Foreign exchange market, Inflation, Exchange rate, Export, Import, Balance of payment, National Bank, Deflation, Depreciation, Monetary policy

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List of Abbreviations

CNB	Czech National Bank
CPI	Consumer Price Index
CSO	Czech Statistical Office
CZK	Czech Koruna
ECB	European Central Bank
EU	European Union
EUR	Euro (currency)
FX	Foreign Exchange
GDP	Gross Domestic Product
REPO	Repurchase Agreement Rate
VAT	Value Added Tax
2W	Two Week

Introduction

At the end of the year 2013 the Czech national bank has started to intervene on the foreign exchange market in order to weaken Czech crown against EURO and fight against the threat of deflation pressures on the Czech economy. Foreign exchange intervention were used as an unconventional instrument of the monetary policy with uncertain outcome when the traditional instruments have failed. Despite the fact that the Czech national bank already implied the possible use of foreign exchange interventions sooner that year it came as a surprise for both public and economic experts. Possible economic impacts of such a monetary policy became the topic of huge discussion.

The focus of this diploma thesis is on the monetary policy of the Czech national bank and the measures it takes to sustain the price stability and long term economic growth in the national economy. Special attention is given to the foreign exchange interventions against EURO currency that the Czech national bank introduced at the end of year 2013 in order to fight against the threat of deflation pressures. This thesis, among others, analyses the impact of those interventions on the Czech economy. Primary hypothesis of this thesis is that the foreign exchange interventions introduced by the Czech national bank had positive impact on the Czech economy and contributed to the inflation rate and gross domestic product growth. This hypothesis is based on the analysis of various quantitative and qualitative measurements and statistic data from the Czech national bank, the European central bank and the Czech statistical office.

This diploma thesis is divided into five main chapters which are further divided into several sub – chapters. The first chapter of this diploma thesis introduces the role of the Czech national bank, its legal role on the Czech market and its main focus. The second chapter provides the theoretical background of the monetary policy of central banks with focus on monetary policy regimes, time lags in the monetary policy, consumer price index, transmission mechanisms of the monetary policy and monetary policy instruments with special attention on theory of exchange rates. The aim of the third chapter is the explanation of theory of deflation. The threat of deflation is the main reason why

the Czech national bank decided to use foreign exchange interventions as its monetary policy instrument.

The fourth and fifth chapters are the key parts of this thesis as it analyses the main macroeconomic indicators of the Czech economy prior to and after the introduction of the foreign exchange interventions by the Czech national bank. The development of inflation rate, annual GDP growth, foreign trade, labour market and exchange rate of CZK/EUR prior to the foreign exchange interventions are analysed and assessed. The fifth chapter builds on the fourth chapter and analyses the same macroeconomic indicators, however after the interventions began and measures its real impact on the Czech economy. Moreover, the fifth chapter includes the analysis of interventions timeline, expert's opinions and evaluation. Finally, assessment of the economic development forecasts were conducted. The conclusion of this thesis is the overall analysis and assessment of the current situation of the Czech economy.

Objectives and Methodology

Objectives

Objectives

The main objective of this thesis is the analysis of foreign exchange monetary interventions introduced by the Czech national bank at the end of year 2013 and its impact on the main macroeconomic indicators of the Czech Republic's economy.

First objective is the analysis of the general role of the national bank in the economy and the monetary policy instruments it uses to ensure price stability and economic growth along with theoretical economic effect of those instruments. Moreover, this thesis analyses the theory of exchange rates and deflation.

Second major objective is the analysis of impact that the interventions had on the main macroeconomic indicators. In particular inflation, gross domestic product, foreign trade, employment and exchange rate with focus on positive and negative effects that occurred after the introduction of interventions. Complex analysis of the economic effects with specific outcomes is the added value of this diploma thesis.

Primary hypothesis of this thesis is that the foreign exchange interventions introduced by the Czech national bank had positive impact on the Czech economy and contributed to the inflation rate and gross domestic product growth.

Methodology

The methodology of this thesis is based on the secondary research. Firstly, analysis of literature and relevant information sources was conducted. Secondly, search and analysis of statistical figures and data was made. For the purpose of this thesis, data from the Czech national bank, the European central bank and the Czech statistical office were used. Based on this analysis, quantitative and qualitative evaluation and interpretation of obtained statistical figures and data was conducted. The final outcome of this thesis is based on descriptive and comparative method of analysed data.

1 The Role of the Czech National Bank

The national banks of democratic countries usually have a similar role – the role of ensuring price stability in the economy. It is responsibility of each national bank to create a stable environment for business development. The essential prerequisite for implementation of monetary policy is the independence of national banks.

The Czech national bank has become the central national Bank of the Czech Republic on 1 January 1993 with the establishment of independent Czech State. The role of the CNB´s monetary policy is legally codified in the provision of Article 98 of the Czech Constitution and § 2 of Law no. 6/1993 Coll. on the Czech National Bank.

According to the § 2 of Law no. 6/1993 Coll The Czech National Bank fulfils these tasks: (CNB, 2016).

a) sets monetary policy,

b) issues banknotes and coins,

c) manages the circulation of payments and clearing banks, foreign banks carrying on banking activities in the Czech Republic through its subsidiaries and credit unions, takes care of smooth and economic efficiency and contributes to securing safety, reliability and efficiency of payment and settlement systems and their development,

d) supervises entities operating on the financial market,

e) recognizes, monitor and assess risks to the stability of the financial system and in order to avoid or reduce these risks contributes through its powers to the resilience of the financial system and maintains financial stability and creates a macro-prudential policy; if necessary cooperates in the creation of macro-prudential policy with state authorities, whose are in scope of this policy,

f) performs other activities pursuant to this Act and under other laws.

These two documents primarily charge CNB to ensure a long-term price stability. The secondary role is to support general economic policies of the Government which lead to the sustainable economic growth. The secondary role should be performed only in case it does not prejudice the main target.

CNB focuses on the stability of consumer prices which means moderate growth rather than fixed prices. Price growth should include statistical bias toward upward, which occurs when measuring the growth of these prices. This should also provide sufficient space for small changes which constantly occur in the economy. To ensure the price stability CNB uses the monetary policy regime known as inflation targeting. More details about inflation targeting and other monetary policy regimes will be introduced in the next chapter. (CNB, 2016)

2 Monetary policy

Monetary policy is one of the key functions of central banks. It is set of actions taken by central bank following its primary target which is ensuring price stability of the country's economy. To achieve its targets, central bank uses monetary policy regimes and instruments. The decision processes are based on current economic development, future predictions and risk assessment in order to avoid negative deviations from required state. (CNB, 2016)

2.1 Monetary policy regimes

There are four basic monetary policy regimes adopted by central banks.

2.1.1 Regime with and implicit nominal anchor

Under this scheme, the central bank tries to target specific nominal values which choice was held internally and not shared with public. This regime provides a discipline on policy-making and avoids so called time-inconsistency problem. This is usually caused by incentives for a policymaker to pursue short-run objectives even though it will not produce higher growth in long run. This time-inconsistency problem does not appear in this regime because the police makers are not influence by the public interests. Moreover implicit nominal anchor also helps to set inflation expectations directly through its constraint on the value of domestic money. (Mishkin,1998)

2.1.2 Regime of exchange rate targeting

This regime has a long history. It ensures the stability of the nominal exchange rate of the domestic currency against the large, low-inflation anchor country or against the basket of currencies. This directly contributes to keeping inflation under control thus fixes the inflation rate for international traded goods. The assumptions of this regimes are sufficient amount of foreign exchange reserves, maintaining the competitiveness

and credibility of the country and appropriate combination of economic policies. (Mishkin, 1998)

2.1.3 Regime of Monetary 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, however, lies in the choice of an appropriate monetary aggregate to target. In an environment of financial innovation, market computerisation and globalisation, the relationship between monetary aggregates and the price level is becoming ever weaker. The central bank may also fail to manage the selected monetary aggregate with sufficient precision. (CNB, 2016)

2.1.4 Inflation targeting regime

Under inflation targeting, the central bank publicly pre-announces an inflation target (or a succession of targets) that it is determined to achieve. This involves active and direct shaping of inflation expectations. Based on those expectations central bank then determines short term interest rates (repo rates) using its monetary policy instruments. This regime's decision-making scheme involves the use of much more information than merely the exchange rate or monetary aggregates, covering the labour market, import prices, producer prices, the output gap, nominal and real interest rates, the nominal and real exchange rate, public budgets, etc. Czech central bank uses inflation targeting regime since 1998 to achieve price stability in the Czech economy. (CNB, 2016)

There are three basic ways how to set inflation targets:

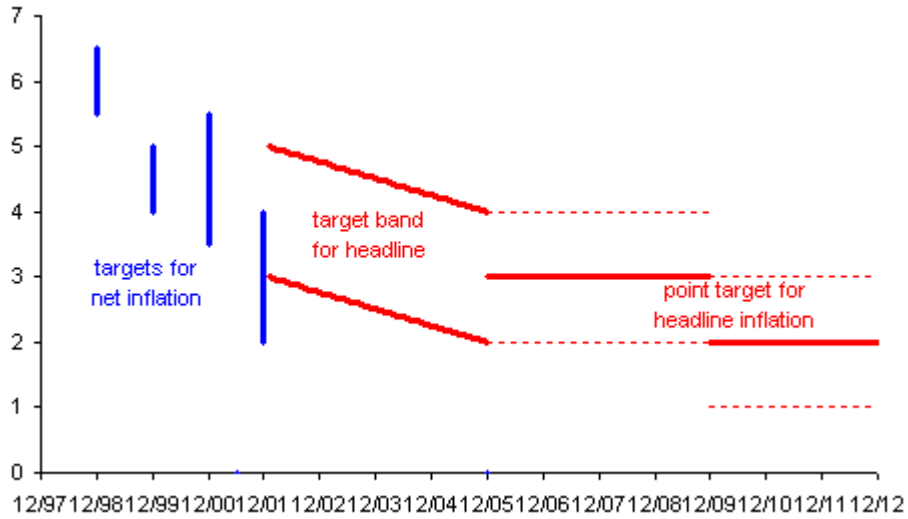
- Inflation target expressed as a percentage figure
- Inflation target expressed as a percentage figure with percentage tolerance rate
- Interval of two percentage points in which the central bank is trying to sustain the inflation rate

Czech national bank is currently using two percent inflation targeting rate with one percent tolerance band. Low average stable inflation rate is considered positive thing for the economy as it brings positive expectation of future economic development, further growth in aggregate demand and GDP, growth in consumption and investments, growth employment, money supply etc. (ČNB online, Inflation targeting in the Czech Republic).

When determining the inflation target, the first step that central bank need to take is to set inflation target that corresponds with ideal economic development within the country's economy and does not have negative effects on economic subjects. It is such a growth rate that demarcates all positive aspect determining price stability.

Furthermore, in its monetary policy decision-making the CNB Bank Board assesses the latest CNB economic development forecast and evaluates the risks of non-fulfilment of this forecast. Future predictions are essential because monetary policy actions taken by central banks affect the economy with certain time lags (which will be discussed further in a next chapter). Economic forecast is created based on analysis of future expected outcomes of national and international economies. Based on these considerations the Bank Board then votes on whether and how to change the settings of monetary policy instruments. By changing these instruments the central bank seeks to offset excessive inflationary or disinflationary pressures which are deviating future inflation from the inflation target or from the tolerance band around this target. Main instrument used in the inflation targeting regime is short-term nominal interest rate announced by the National bank. All the instrument used by the National bank to achieve desired price stability will be analysed further on. (CNB, 2016).

Graph 1 The CNB´s inflation targets



Source: (CNB, 2016)

The graph shows the development of Czech national bank's inflation targeting in % between 1998 - 2012. Since 2005 CNB uses inflation target of 2 % with 1 % tolerance rate. CNB plans to use this target inflation until Czech Republic accepts EURO as its currency.

(CNB, 2016)

Inflation targeting has also many critics such as former Czech president, Vaclav Klaus. According to him inflation targeting is trendy, however absolutely wrong. Mr. Klaus criticise the fact that the inflation targeting is based on future expectations dependent on the bank board and moreover, the constant growth in inflation rate causes long-term depreciation of domestic currency. On the other hand inflation targeting has also many supporters and is currently used by European central bank. (Klaus, 2014)

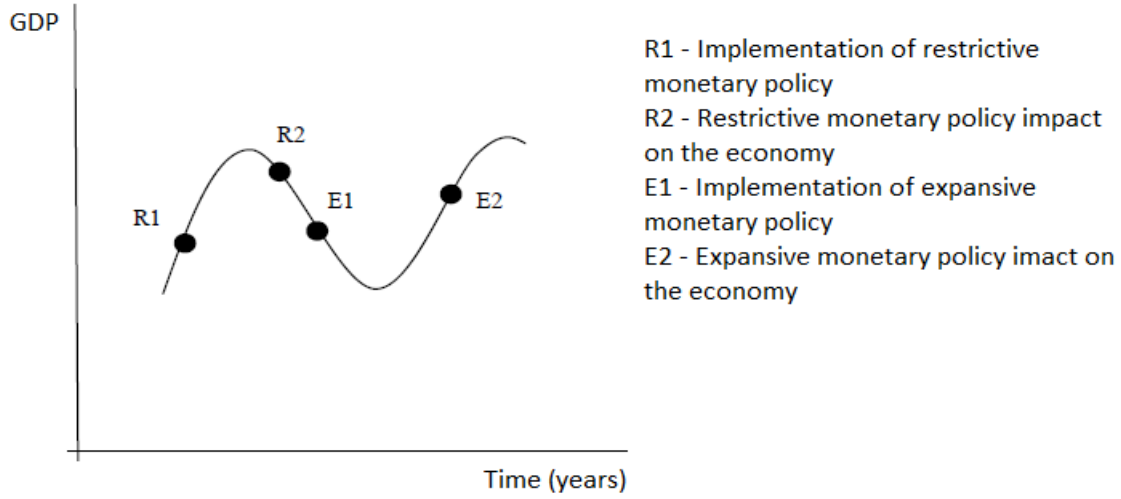
2.2 Time lags in the monetary policy

Time lag is a phenomenon that decreases monetary policy efficiency when carried out by central bank. It is the gap between past economic development, future predictions and final effect of steps taken by central bank.

Graph below shows fore-mentioned time lags in monetary policy. Steps executed by central bank based on current economic development can influence the national economy in the opposite phase of economic cycle without desired effect. Today's actions will influence GDP, inflation employment and other economic indicators with significant delays. This is the reason why central banks can't act based on current economic development and shows the vital importance of economic predictions. (Revenda, 2011)

Based on the experience of developed economies, it takes approximately one year after the monetary policy changes for the change in aggregate demand to be noticed and another year to influence inflation. (Friedman, 1970)

Graph 2 Time lags in monetary policy and economic cycle



Source: (Revenda, 2011)

2.3 Consumer price index

Consumer price index (CPI) is used by Czech national bank to assess year to year increase of consumer prices. CPI is used as an instrument for inflation targeting and is one of the most important indicators of price level development.

- CPI is based on data published by the Czech statistical office (CSO). CPI is measured by so called “consumer basket”.
- Consumer basket is constructed in a way to display the structure of consumption in an average household.
- Consumer basket consists of 700 goods and services that are consumed in average households.
- Approximately 25 % of consumer basket is created by imported goods.
- Large share of consumer basket is created by volatile items such as food or petrol expenditures.
- Approximately half of the consumer basket is directly influenced by monetary policy of the Czech national bank.
- CPI index is based on net inflation (do not consider the change in indirect taxes)
- CPI index is calculated as: (cost of CPI consumer basket at current prices : cost of consumer basket at previous year prices) x 100- (Rezabek, 2014)

Following graph indicates the development of Consumer price index in the Czech Republic between years 2012 - 2016.

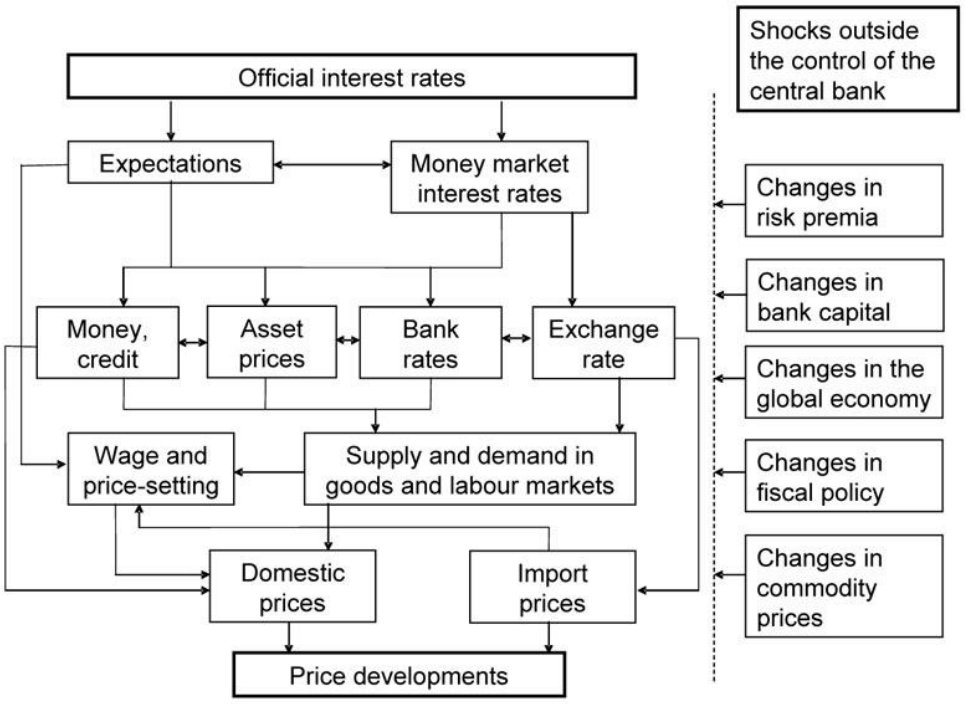
Graph 3 CPI index development (2012-2016)

Source: (Trading Economics, 2016)

2.4 Transmission mechanism of monetary policy

Transmission mechanism of monetary policy is a chain of relationships in economy that central bank use to achieve its goals and objectives. In inflation targeting reality it how the changes in monetary policy instruments can lead to required changes in inflation rate. Monetary policy instrument that will be discussed in next chapter have direct influence on intermediary criteria through which the target criteria (in this case interest rate) is influenced. Following diagram depicts the chain of relationships of transmission mechanisms of monetary policy. (CNB, 2005)

Graph 4 Transmission mechanism of monetary policy



Source: (ECB, 2016)

2.4.1 Monetary transmission mechanism

The main focus of monetary transmission mechanism is to sustain low average inflation rate. This is achieved through influencing money supply in the economy and its components (for example amount of commercial banks reserves), consequently influencing inflation rate. In this case money supply serves as an intermediary criterion. (Revenda, 2011)

2.4.2 Interest rate transmission mechanism

Interest rate transmission mechanism is a process of influencing inflation rate through short term interest rate. It is a chain of economic relationships that through monetary policy influence gradually influence inflation rate. First step for the central bank is to choose

the monetary policy instrument that they will be using. In second step chosen instrument affects immediately influence the intermediary markets that changes its behavioural patterns. This leads influence other intermediary markets and finally affect the target market and influence the inflation rate. There are many monetary policy instruments that can be used to affect interest rate in the economy. This will be analysed later on. Functioning of monetary policy through interest rate transmission mechanism in the inflation targeting regime can be described in the following example.

In pursuit of decrease in inflation rate central bank increase the short term interest rates through the monetary policy instruments. This leads to increase in the market interest rates. Subsequently this causes higher instalments for market subjects and also stricter criteria for receiving credits. As an effect, the households savings increase, consumption decreases and firms restricts their investments. Finally, this leads to lower GDP, lower employment, decrease in salary growth and most importantly decrease in inflation rate. Conversely, if central bank strives for increase in the inflation rate it decrease the short term interest rates. Causing decrease in market interest rates, lower instalments, less credit restrictions, decrease in saving, increase in consumption, increase in investments, increase in GDP, employment and salary growth and finally increase of the inflation rate. (Revenda, 2011)

2.4.3 Exchange rate transmission mechanism

Exchange rate transmission mechanism is, similar to interest rates transmission mechanism, series of economic relationships that aims for changes in the inflation rate through foreign exchange interventions by the central bank. There are two channels in exchange rate transmission mechanism that can influence inflation rate.

First is by foreign exchange interventions (FX interventions). By FX interventions central bank influences the exchange rate of domestic currency against foreign currency. The change in exchange rates immediately influence prices of imported goods that either increase or decrease in a similar direction as the exchange rate. This has immediate, however only short-term effect on price level in the economy. The long term effects of FX interventions are inflation expectations that either increase or decrease based on the type

of interventions (purchases or sales of the foreign currency). Subsequently influencing price level in the similar direction. The level of FX intervention effect is based on the level of the economy openness. The more open economy, the more effective FX interventions are in all its mentioned points.

The second exchange rate transmission mechanism channel influences inflation rate through interest rates. Functioning of monetary policy through exchange rate transmission mechanism in the inflation targeting regime can be described in the following example. In pursuit of decrease in inflation rate central bank increase the short term interest rates through the monetary policy instruments. This leads to increase in the market interest rates. Subsequently those pressures leads to appreciation of domestic currency exchange rates, decrease in import prices, increase of import, decrease of export, decrease of GDP, employment and salary growth and gradually decrease of the inflation rate. Conversely, if central bank strives for increase in the inflation rate it decreases the short term interest rates. Causing decrease in market interest rates, depreciation of domestic currency exchange rates, increase in import prices, growth of export and decrease of import, higher GDP employment and salary growth and finally higher inflation rate. (Revenda, 2011)

2.5 Monetary policy instruments

As mentioned in the previous chapter the main target of the national bank is to ensure price stability in the national economy, in other words reaching sustainable and low inflation rate. In order to achieve its goals, national bank uses set of monetary policy instruments through which CNB influence its operating goals (usually short-term interest rate and monetary exchange rates) and thus reaching its final targets. Monetary policy instrument can be divided into three main groups: direct, indirect and combination of direct and indirect instruments. **Direct instruments** includes administrative and non-market operations that directly restrict commercial banks and influence their decision making processes, such as credit limits or obligatory deposits. **Indirect instruments** include market operations of central bank which may or may not be followed by commercial

banks, such as open market operations or foreign exchange interventions. Last group includes instruments that can't be directly recognised as one or the other, such as obligatory minimum reserves, appeals or recommendations of central bank. Analysis of most used monetary policy instruments follows. (Holman, 2010)

2.5.1 Open market operations

Open market operations are one of the most frequently used and most effective set of instruments in market economies used by central bank. Its main purpose is to channel short-term interest rates. Open market operations are cashless actions changing only the amount of commercial bank reserves. Essence of open market operations is in purchasing and selling of securities by central bank to commercial banks in local currency. (Jilek, 2004)

Open market operations takes the form of repo tenders. The CNB accepts surplus liquidity from banks and in return transfers eligible securities to them as collateral. The two parties agree to reverse the transaction at a future point in time, when the CNB as borrower repays the principal of the loan plus interest and the creditor bank returns the collateral to the CNB. The basic duration of these operations is 14 days; the two-week repo rate (2W repo rate) is therefore considered to be of key importance in terms of monetary policy. Exceptionally, the repo operations with shorter maturity are executed as well as supplementary monetary instrument in form of three-month repo tender. (CNB, 2016)

2.5.2 Discount rates

These are historically one of the oldest instruments of monetary policy used by central banks and they are still widely used nowadays as a tool to influence monetary base (bank reserves) and short term interest rates. It is the interest rate set by the central bank that is offered to commercial banks (or other depository institutions) used to control liquidity and money supply. Lower discount rates results in cheaper borrowings for commercial

banks and thus results in an increase of money supply in the economy and vice versa. (Rezabek, 2007)

2.5.3 Minimum reserves

The minimum reserves are generally one of the main monetary policy instruments through which the central bank can influence the amount of money supply in the banking system and thus economy. In the Czech environment of a substantial liquidity surplus, however, this role is declining and the minimum reserves serve mainly as a cushion for the smooth functioning of the interbank payment system. By using minimum reserves instrument, central bank sets what percentage of primary deposits of commercial banks must be held in the central bank. This rate influence money supply in the economy. In the Czech Republic minimum reserves for commercial banks and other depository institutions is set to 2 % of their primary deposits. (Rezabek, 2007)

2.5.4 Foreign exchange interventions

Foreign exchange interventions (FX interventions) are sales or purchases of foreign currencies against Czech crown (CZK) by the national bank through the foreign exchange market. This instrument is not used very often in the inflation targeting regime when compared with interest rate adjustments. Foreign exchange interventions are used mostly in case when interest rate reaches technical zero and further monetary policy easing might be done through weakening CZK. The Czech national bank was forced to use foreign exchange interventions at the end of 2013 when bank board decided to intervene on the foreign exchange market and weaken CZK to reach exchange rate close to 27 CZK/EUR in order to fight deflation pressures and support export activities. The fore-mentioned interventions and its impact on the Czech economy are main focus of this thesis.

The main target of foreign exchange interventions is to influence development of domestic currency exchange rate. Furthermore, FX interventions have also impact on other economic indicators such as short term interest rate or amount of reserves of commercial banks; however this influence is not primary target of this instrument. Development of domestic currency exchange rate is based on demand and supply for domestic currency and foreign currencies on FX market. To influence this relationship central banks use three types of interventions, direct, indirect and verbal. (CNB, 2016)

2.5.4.1 Direct FX interventions

Direct FX interventions are sales or purchases of foreign currencies reserves for domestic currency on FX market. Its primary objective is tightening or easing of monetary policy. As mentioned before, this kind of interventions is used in inflation targeting regime in case when short term interest rates reaches technical zero and further adjustments of interest rates as a traditional instrument can't be used. In such a case monetary policy easing has to be accomplished through direct depreciation of domestic currency. The following table shows current short term interest rates issued by CNB and valid since 2.11.2012

Table 1 Current short term interest rates

Interest rates	Interest rate	Valid since
Two week repo rate	0.05 %	2 November 2012
Deposit facility – discount rate	0.05 %	2 November 2012

Source: Own representation, data from (CNB, 2016)

The table shows that two-week repo rate and deposit rate has reached technical zero. This is one of the reasons why CNB intervened on FX market in order to depreciate domestic currency to EURO. (Lizal and Schwarz, 2013)

2.5.4.2 Indirect FX interventions

Indirect FX interventions are done through adjustments of interest rates by central bank in order to influence movement of foreign capital. This movement leads to change in supply and demand of foreign currencies and thus in change of exchange rate. This instrument is currently not used by CNB as the interest rates already reached technical zero. (Lizal and Schwarz, 2013)

2.5.4.3 Verbal interventions

Verbal interventions is indirect instrument used by CNB in order to influence domestic currency exchange rates. In this case bank board release information to public about intention of national bank to trade on foreign exchange market. With respect to market behaviour patterns, economic expectations and psychology of subject on FX market, those verbal interventions have sometimes similar effect as direct interventions. Success of this instrument depends on investor expectations and also on credibility of the given central bank in the eyes of investors. (Lizal and Schwarz, 2013)

2.6 Economic effect of FX interventions

The effect of direct FX interventions on main economic indicators, therefore effect of mechanism caused by purchases and sales of foreign currencies by the national bank can be divided into three main categories: (Sarno and Taylor, 2003)

- Short-term effect: reaching desired foreign exchange rate to domestic currency by matching supply and demand for the foreign currency
- Mid-term effect: influence on interest rates
- Long-term effect: influence on money supply in the economy

2.6.1 Short-term effect

Direct FX interventions have immediate impact on supply and demand for foreign currency and also on the exchange rate. Purchases of foreign currency for domestic currency increases (when other conditions remained unchanged) demand for the foreign currency on the domestic foreign exchange market causing increase in supply of the domestic currency. This leads to the depreciation of domestic currency or discontinuance of its appreciation. On the other hand by selling foreign currency in exchange for domestic one (when other conditions remained unchanged) central bank increases foreign currency supply on the market and also increases demand for domestic currency causing appreciation of domestic currency or discontinuance of its depreciation. The effect is immediate and last until exchange rate reaches its equilibrium point (demand equals supply). (Sarno and Taylor, 2003)

In case of CNB FX interventions issued in 2013, Czech national bank determined the required exchanged rate of 27 CZK/EUR with small oscillation rate as its target. Due to the tendency of CZK to appreciate below the target Czech national bank decided to intervene against its appreciation by purchases of EURO currency on foreign exchange market. (Lizal and Schwarz, 2013)

2.6.2 Mid-term and long-term effect

Mid-term and long-term effects on the interest rate and money supply are closely connected so they will be described as a whole. Direct monetary interventions do not cause only surplus in either supply or demand for foreign currency, but also surplus in supply or demand for money caused by changes in the interest rates. Purchases of foreign currency by national bank on foreign exchange market subsequently means also selling of the domestic one causing surplus in money supply on domestic market. Surplus in supply over demand causes decrease in domestic interest rates. Reversely, by selling

foreign currency national bank causes decrease in money supply (surplus of demand over supply). The effect is increase in domestic interest rate. Finally, the effect on the domestic interest rate is mid-term, but the effect on money supply is long-term, until the central bank decides to seize the interventions. (Durcakova and Mandel, 2010),

2.7 Effect of exchange rates on foreign trade

Czech Republic's economy is small and open with high dependency on export of goods and services. Therefore foreign exchange rates plays important role in the economic development. Main foreign trade indicators used to assess the amount of foreign trade are trade balance and balance of services. Both of those indicators are part of current account in the balance of payments. Trade balance measures the amount of export and import in the economy expressed in domestic currency. Based on the results there can be either surplus or deficit of the trade balance. Balance of services measures import and export of services expressed in domestic currency. Commonly used indicator is a performance balance, which is the sum of trade balance and balance of services and expresses the sum of export and imports of goods and services in the given economy.

Balance of payments as a whole is a statement that summarizes an economy's transactions with the rest of the world for a specified time period. The balance of payments, also known as balance of international payments, encompasses all transactions between a country's residents and its non-residents involving goods, services and income, financial claims on and liabilities to the rest of the world. Balance of payment consist of current account (trade balance, balance of services, net investments and transfers), capital account, financial account, balancing account and reserves.(Holman, 2005)

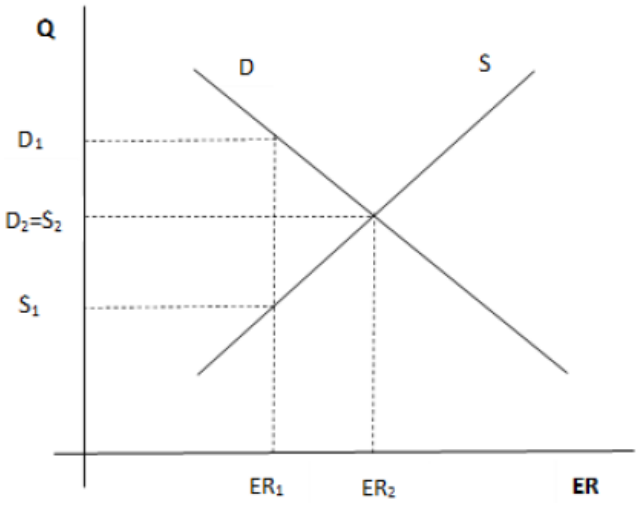
As it was already mentioned in the previous chapter depreciation of domestic currency increases competitiveness of domestic producers on foreign markets (weaker domestic currency brings higher profits for exporters) and also makes imported goods and services

more expensive on the domestic market. In theory, domestic currency depreciation should lead to increase in performance balance (surplus of exports over imports). So called balancing mechanism of balance of payments which states that deficit of performance balance (import larger then export) leads to depreciation of domestic currency and subsequently causes growth of export and decrease of import resulting in the balance between import and export (original deficit is eliminated). (Reinert, 2009)

Hypothetically, there are three possible effects of performance balance deficit on domestic currency exchange rate depreciation. All three scenarios are based on the fact that performance balance is in a deficit at the beginning and therefore causing pressures on domestic currency depreciation. This assumption is only because of simplification, following models can be used vice-versa assuming initial surplus in performance balance causing pressures on appreciation of domestic currency. (Mandel and Tomsik 2003)

Following graph shows the first model situation. Model assumes elastic demand for foreign currency (import) and elastic supply of foreign currency (export). Domestic currency depreciation leads to decrease in demand for foreign currency (import) and growth of foreign currency supply (export). Original deficit in performance balance is eliminated (D2=S2=ER2)

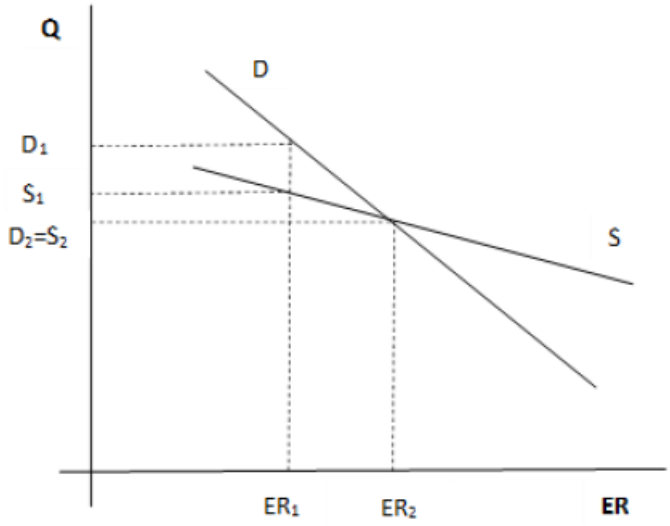
Graph 5 Effect of domestic currency depreciation on performance balance – model 1



Source: (Mandel and Tomsik 2003)

Next graph shows the second possible scenario. Model assumes that the foreign currency supply (export) is due insufficient demand for domestic export declining. Foreign exchange supply (export) is declining in slower pace than demand for foreign currency (import). This leads to equality of performance balance (D2=S2=ER2) despite the decline in export. However, in longer time period then in the first model situation.

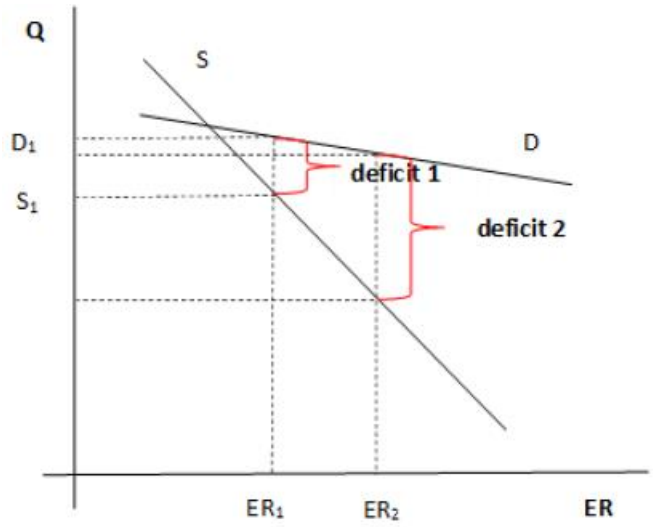
Graph 6 Effect of domestic currency depreciation on performance balance – model 2



Source: (Mandel and Tomsik, 2003)

Following graph shows third model situation. Model assumes decline in both demand for foreign currency (import) and supply of foreign currency (export), but in this scenario foreign currency supply is declining in faster pace than demand. Depreciation of domestic currency in this case leads to further deficit in performance balance. This third scenario is an example of situation when Marshall-Lerner condition has not been met. Marshal-Lerner condition states that to improve deficit of performance balance (increase in export) through domestic currency depreciation can be achieved only if the sum of elasticity of domestic demand for foreign import and elasticity of foreign demand for domestic export in absolute value is higher than 1. (Mandel and Tomsik, 2003)

Graph 7 Effect of domestic currency depreciation on performance balance – model 3



Source: (Mandel and Tomsik, 2003)

3 Deflation

According to International monetary fund deflation is defined as a sustained decline in an aggregate measure of prices such as the consumer price index or the GDP deflator. In other words it means continuous long-term decline of price level in the economy. The important condition of deflation is that it must be continuous and long-term, at least 6 months and more. Shorter deflation pressures should not pose any significant threat. (Rogoff, 2003)

For better understanding, it is necessary to divide deflation into two categories based on the initial starters. According to the cause of the deflation it is considered either "good" (positive) or "bad" (negative) deflation.

- Negative caused by demand shock.
- Positive caused supply shock.

3.1 Positive deflation

So called "good" deflation has its origin in a positive supply shock and is connected to the economic prosperity period – GDP growth, higher profits, higher labour productivity, real salary growth, etc. The initial cause for this type of deflation is usually technology innovations, rapid growth of productivity, trade liberalization, fiscal policy changes or decrease in input prices. (Rogoff, 2003)

3.2 Negative deflation

Opposed to the positive deflation, negative one is caused by negative demand shock. This can be caused for example by "bubble burst" on assets market, cyclical economic decline, consumers preference shift, decrease of consumption, investment pessimism, restrictive monetary or fiscal policy, appreciation of domestic currency and many others, or its combination. The impact of negative deflation can be further emphasised by deflation

expectations by firms and consumers or mistrust in markets by firms and consumers. (Rogoff, 2003)

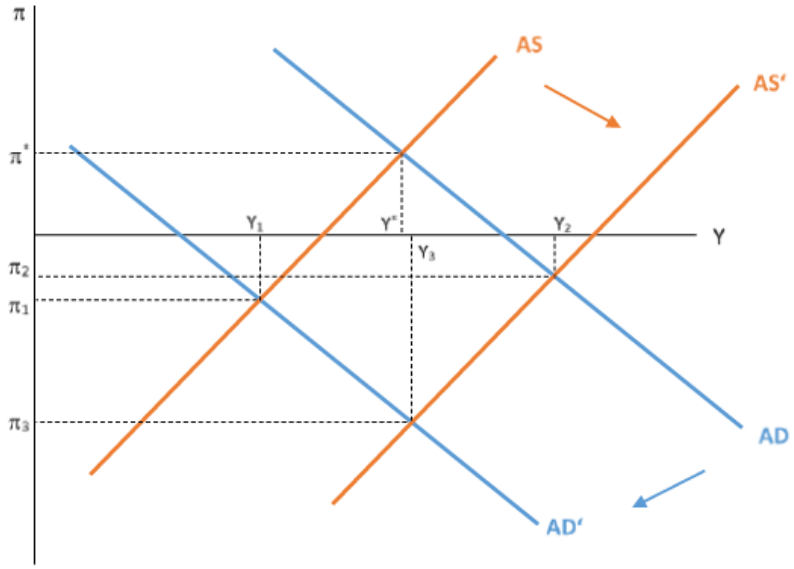
In other words, “good” deflation occurs when inflation rate and interest rates are declining, consumers have higher purchasing power, GDP is growing and productivity is increasing thanks to the technological innovations. On the other hand “bad” deflation occurs when inflation rate and interest rates are declining, however consumers are losing purchasing power, GPD is decreasing and also productivity is decreasing. (Kaza, 2006)

Modern economic approach literary define deflation as stage in which consumer can purchase more for the same amount of money. That is because price level is decreasing and therefore money purchasing power is increasing. Deflation might be seen as positive thing to happen in the economy, however the contrary is true. Deflation in today’s reality is considered much bigger threat then inflation. In deflation prices of everything are decreasing – stocks, real estate market, wages, etc. In deflation consumers are basically day to day poorer. (Luskin, 2001)

3.3 Deflation in AS-AD model

Model of aggregate demand and supply is often used by economist as a tool to demonstrate price level changes impact on economy. This model is theoretical and is simplified from the reality, however it is good thing to demonstrate the relationships occurring in the economy. Following image shows the deflation in AD-AS model in negative demand and positive supply shocks. (Holman, 2010)

Graph 8 Deflation in AD-AS model



Source: (Rogoff, 2003)

Originally, the economy occurred at its potential output (highest level of real gross domestic product sustainable over long term) at point (π*, Y*). From the graph it is obvious that deflation can be caused by two factors as was mentioned in a previous chapter). Firstly, strong negative demand shock can shift the aggregate demand curve into the point (π1, Y1) where decrease in price level is followed by decrease of GDP (potential output).The second scenario depicts the positive supply shock where the aggregate supply curve shifts into point (π2, Y2) and with decrease of price level causes increase in GDP. Often both of those effects occur in the economy shifting economy into point (π3, Y3). In this case both of those effects cause deep decrease in price level and the final outcome of GDP depends on which of those effects (positive or negative) out-weights the other. (Rogoff, 2003)

3.4 Deflation spiral

In case of deflation caused by the negative demand shock, there is a threat the economy will fall into so called deflation spiral. This effect forces aggregate demand into further decline. Consumers calculate the decline in inflation into their expectations. Subsequently, when there are deflation expectations, consumers tend to postpone their expenditures causing decrease in demand for products and forcing suppliers to lower the prices. The spiral is spinning and aggregate demand and GDP is gradually decreasing. With further decrease in price level the real price of the debts increases causing additional expenditure restriction in consumer's behaviour and further aggregate demand decline. Decreasing price of goods and increasing price of the debt leads to high amount of bad loans leading to high probability of bankruptcy.

In this case, central bank would probably try to lower interest rates through its monetary policy instruments in order to support investments and inflation. However, this can lead to a situation when it will not be possible to lower the interest rates any further as they will reach technical zero level and traditional instrument of monetary policy can't influence aggregate demand, GDP or inflation any further and fails. In that case central bank is forced to use unconventional monetary policy instruments and transmission mechanisms such as FX interventions in case of the Czech national bank. (Holman, 2010)

3.5 Effect of deflation on economy

It is necessary to consider deflation according to its cause. Good deflation caused by supply shocks and followed by growth of GDP is not considered as aggravating and there is no reason to be afraid of it. However, on the other hand negative deflation caused by decrease in aggregate demand is considered very costly for the economy and needs to be approached with extreme caution. In general, deflation is being criticised for its higher economic costs when compared with inflation. It is not just simply opposite of inflation, it is usually far more dangerous. This is, among others, reason why the central bank uses

targeting inflation. It sends the signal to firm that the economy is doing fine so that they can adjust its production to the positive economic development expectations. Below is the summary of arguments against deflation and analysis how constant decline in price level can damage economy. (Rogoff, 2003)

There are four main arguments:

3.5.1 Negative effect on debts and wealth distribution

In relationship between debtors and creditors, deflation brings increase of real debt value (decrease in credit value) that the debtor is obliged to return. There is a threat that the debtors will not be able to repays their debts and creditor is threatened by credit default swaps, bankruptcy or necessary firm restructuration. In other words, deflation causes shift of wealth distribution from debtors to creditors. (Buiter, 2003)

3.5.2 Negative effect on interest rates and monetary policy

Inflation is tightly connected to the growth of nominal interest rate that is adapted to inflation rate growth. However, in case of deflation, the nominal interest rate decreases until it reaches zero limit below which it can't decline simply because the most liquid asset in form of cash has zero interest. As a result, deflation basically makes loans more expensive and decrease willingness to borrow money, because interest rates do not reflect real decrease of negative inflation value. Moreover, all economic activities dependent on debt financing are weakened, such as purchases of property, cars or trade investments, the unemployment rises, GDP decreases and price level is further deepened.

Along with the interest rates reaching zero level the efficiency of monetary policy of the central bank is decreasing as it is usually conducted through manipulation with short term interest rates. Central bank then ceases the opportunity to influence economic activities through aggregate demand and is forced to use other monetary policy instruments with uncertain outcome, such as FX interventions or purchases of government bonds and other assets. (Buiter, 2003)

3.5.3 Negative effect on consumption

Increase in real debt rate causes the debtors to have lower disposable income that is shifted towards creditors and deepens the decrease of their consumption and investments. To out weight this effect, creditors would have to increase their consumption at the same amount as debtors decreased theirs to equal the difference. However, in reality this does not happen. Furthermore, deflation causes consumption behavioural changes, because of negative future expectations, postponed consumption and increased savings resulting in additional decline in consumption and economic performance. (Buiter, 2003)

3.5.4 Negative effect on profitability and employment

In deflation period, the nominal wages and prices do not adapt effectively (do not decrease as it should). The result is increase in real wages and marginal costs, causing decrease in profitability and production. Another danger lies in the threat of vast increase in unemployment rate, additional decrease in aggregate demand, bankruptcies and other negative effects. (Buiter, 2003)

4 The development of the Czech economy prior to FX interventions

This chapter will analyze development of most important macroeconomic indicators in the Czech economy prior to 7.11.2013 when Czech national bank begun with the foreign exchange interventions. For this analysis I have chosen five indicators which influenced the decision making of the Czech national bank to start using the exchange rate as its monetary policy instrument.

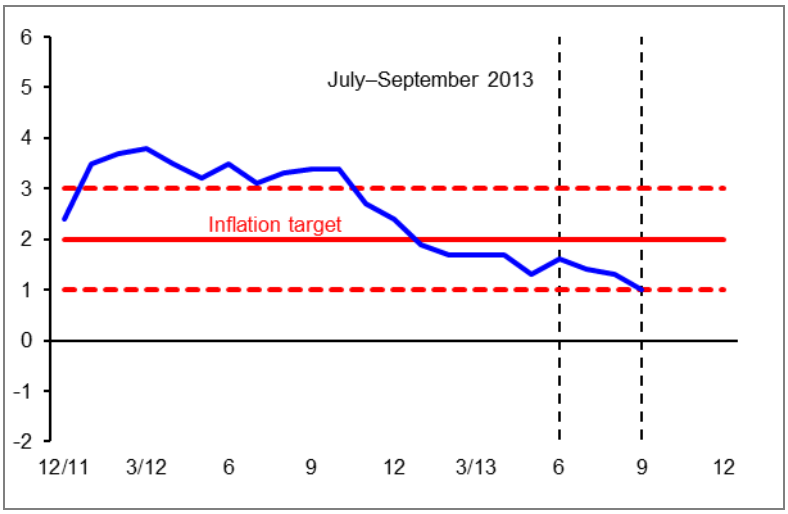
As it was already mentioned the main objective of monetary policy regime of the Czech national bank is the inflation targeting. It sets the inflation target based on the economic analysis of the Czech economy. The inflation target is set to 2 % growth in consumer prices in the country with a possible 1 % deviation above or below this target. This target has been valid since 2010. Every quarter inflation forecasts are published in the CNB's Inflation Reports.

The Inflation report is a source of information about the past, present and forecast future economic developments. The inflation report from December 2013 clearly shows the development of indicators in the domestic economy just before foreign exchange interventions. For this analysis I have chosen five indicators which influenced the decision making of the Czech national bank to start using the exchange rate as its monetary policy instrument.

4.1 The development of the inflation rate

The development of inflation rate can be best described by the graph below showing the development of inflation in Czech Republic based on consumer price index between December 2011 and September 2013.

Graph 9 Development of inflation in the Czech Republic 12/2011 - 9/2013



Source: Own representation, data from (CNB, 2013)

The horizontal axis shows the quarters of the year from December 2011 to September 2013. Vertical axis shows the values of consumer price index in %. The red line represents inflation target set at 2 % by the Czech national bank. The dashed lines at 3 % and 1 % represent the tolerance band for the actual inflation rate. The blue line indicates the development of consumer price index. It is clear that the consumer price index grew at the end of 2011 but since then the disinflationary pressures on the economy have risen and the inflation rate has dropped until it reached 1 % in 2013 which is the bottom limit of the permitted fluctuation of inflation rate. These disinflationary pressures were largely caused by the anti-inflationary pressures of the domestic economy, which was at that time in the decay phase.

Czech national bank tried to reverse this trend by using its main monetary policy instrument and lowered the interest rates. In November 2012, interest rates reached technical zero (0.05 %) and this instrument lost its main purpose. Shortly after, Czech national bank declared the possibility of using FX interventions in order to prevent the deflation threat. This instrument was chosen for several reasons. Mostly because it is supposed to increase price of import and subsequently price level in the Czech economy. Moreover, exporters would reach on higher profits thanks to CZK depreciation leading

to higher investments, employment and GDP. However, first, CNB was using only verbal interventions. (Lizal&Schwarz, 2013).

Current short term interest rates on Czech market are displayed in the table below. Since November 2012 Czech national bank keep the 2W repo rate and deposit facilities at 0,05 % rate which is technical zero.

Table 2 Current short term interest rates

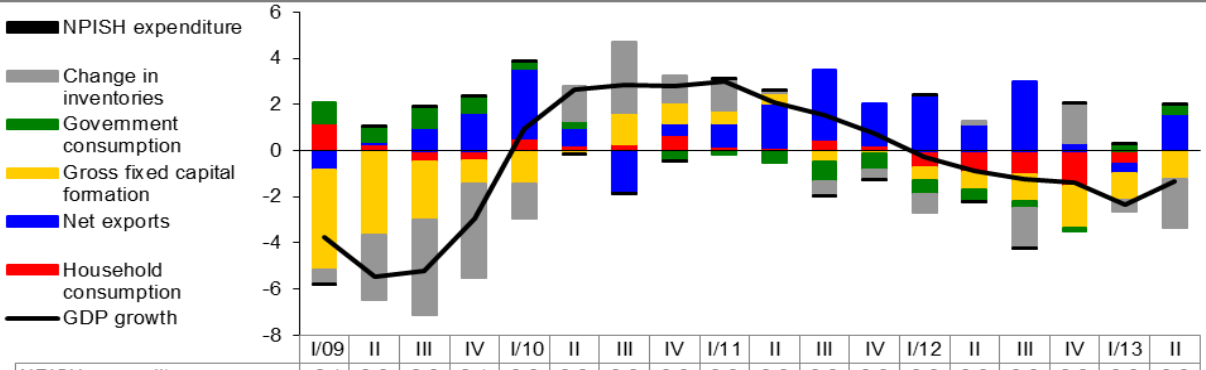
Interest rates	Interest rate	Valid since
Two week repo rate	0.05 %	2 November 2012
Deposit facility – discount rate	0.05 %	2 November 2012

Source: Own representation, data from (CNB, 2016)

4.2 The Developments of the annual GDP growth

The development and the structure of the GDP annual growth in the Czech Republic is shown in the graph below.

Graph 10 The development and the structure of the GDP annual growth in 01/2009-06/2013



	I/09	II	III	IV	I/10	II	III	IV	I/11	II	III	IV	I/12	II	III	IV	I/13	II
NPISH expenditure	-0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in inventories	-0.6	-2.8	-4.1	-4.1	-1.5	1.5	3.1	1.2	1.4	0.1	-0.6	-0.4	-0.8	0.1	-1.7	1.7	-0.5	-2.1
Government consumption	0.9	0.7	0.9	0.7	0.3	0.3	0.0	-0.4	-0.2	-0.5	-0.9	-0.7	-0.6	-0.5	-0.3	-0.2	0.3	0.4
Gross fixed capital formation	-4.3	-3.7	-2.5	-1.0	-1.4	-0.1	1.3	0.9	0.6	0.4	-0.5	-0.1	-0.5	-0.7	-1.1	-1.8	-1.2	-1.2
Net exports	-0.8	0.1	1.0	1.6	3.0	0.8	-1.8	0.5	1.0	1.9	3.0	1.8	2.4	1.1	3.0	0.3	-0.4	1.6
Household consumption	1.2	0.3	-0.5	-0.4	0.5	0.2	0.3	0.7	0.2	0.1	0.5	0.2	-0.7	-1.0	-1.1	-1.5	-0.6	0.0
GDP growth	-3.7	-5.5	-5.2	-3.0	0.9	2.6	2.8	2.8	3.0	2.1	1.5	0.8	-0.3	-0.9	-1.2	-1.4	-2.3	-1.3

Source: Own representation, data from (CNB, 2013)

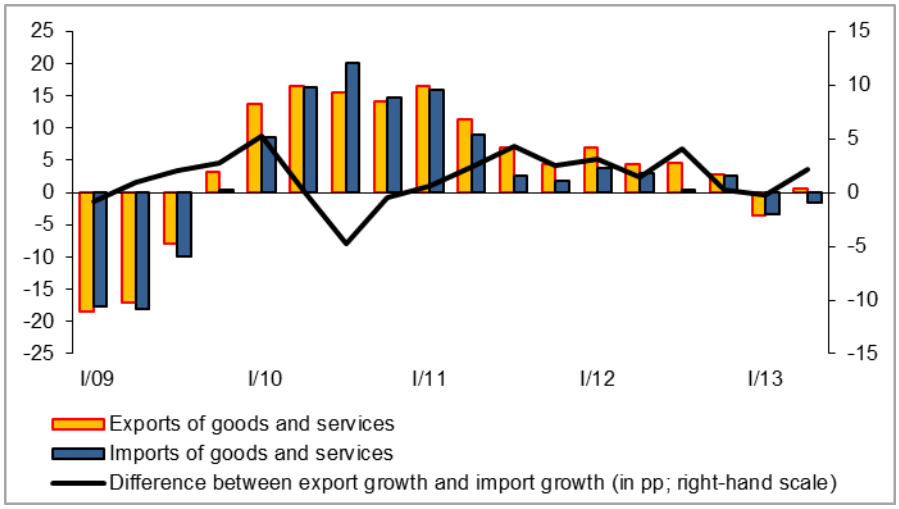
The horizontal axis shows the time period from beginning of 2009 till the third quarter of 2013. The columns show the development and structure of the quarterly GDP growth in %. The black curve represents the overall GDP growth. All data for each quarter are shown in the table below the chart. In 2009 the GDP growth was negative, the positive contributions of government consumption and net exports to GDP developments were outweighed by declines in inventories and fixed investment. The Czech economy showed GDP growth thanks to increase of inventories, gross fixed capital formation and net exports in 2010 and partly in 2011. However since the second half of 2011 the GDP growth declined due to the reductions in government consumption and fixed capital formation. In 2012 the decline in GDP growth was supported by the decline of household consumption which lasted till 2013. This long-term negative development of GDP growth was one of the most important reasons to set FX interventions into motion. (CNB, 2013, page 16).

4.3 Development of foreign trade

The Czech Republic is small, open, export-oriented (with traditionally surplus in balance of payments) economy. The export creates approximately 70-80 % of Czech GDP. The main partner for export is EU with 85 % share on exports, from countries it is Germany with 34 % share on exports. This means that most of the Czech exporters are being paid in EUROs. (CSU, 2016)

The graph below represents the growth of import and export of goods and services in the Czech Republic and the difference between these two indicators.

Graph 11 The growth of import and export of goods and services in 01/2009-06/2013

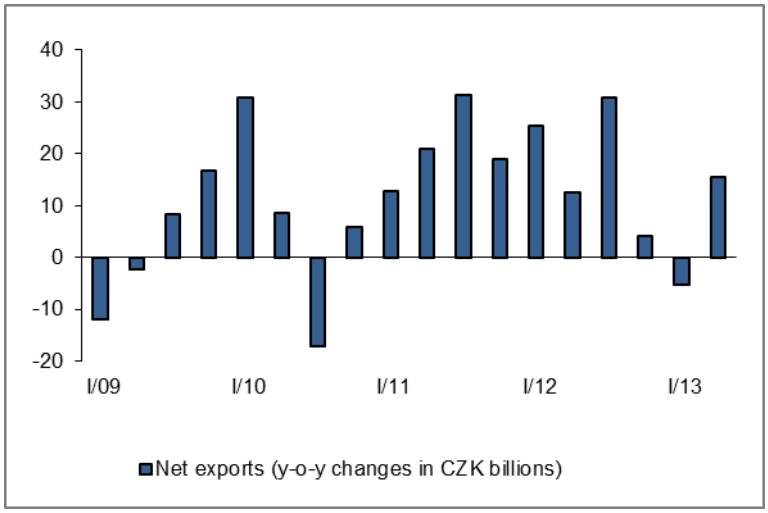


Source: Own representation, data from: (CNB, 2013)

The horizontal axis shows the time period from beginning of 2009 till the third quarter of 2013. The vertical axis represents the percentage change of exports and imports of goods and services and the difference between the growths which is shown as the black curve. From the beginning of 2009 the exports of goods and services grew faster than imports. This continued till the middle of the 2010 when the imports of goods exceeded export. The growths of export and import slowed down during the 2011 and this trend continued till 2013 when the growth of import and exports was negative. Nevertheless, in second quarter of 2013 surplus of balance of payments war reached in the amount of 8.6 bill. CZK. (CNB, 2013)

The next chart shows the growth of net exports in the Czech Republic. Net export represents the important part of GDP. It is calculated as a difference between export and import.

Graph 12 Net exports in 01/2009-03/2013



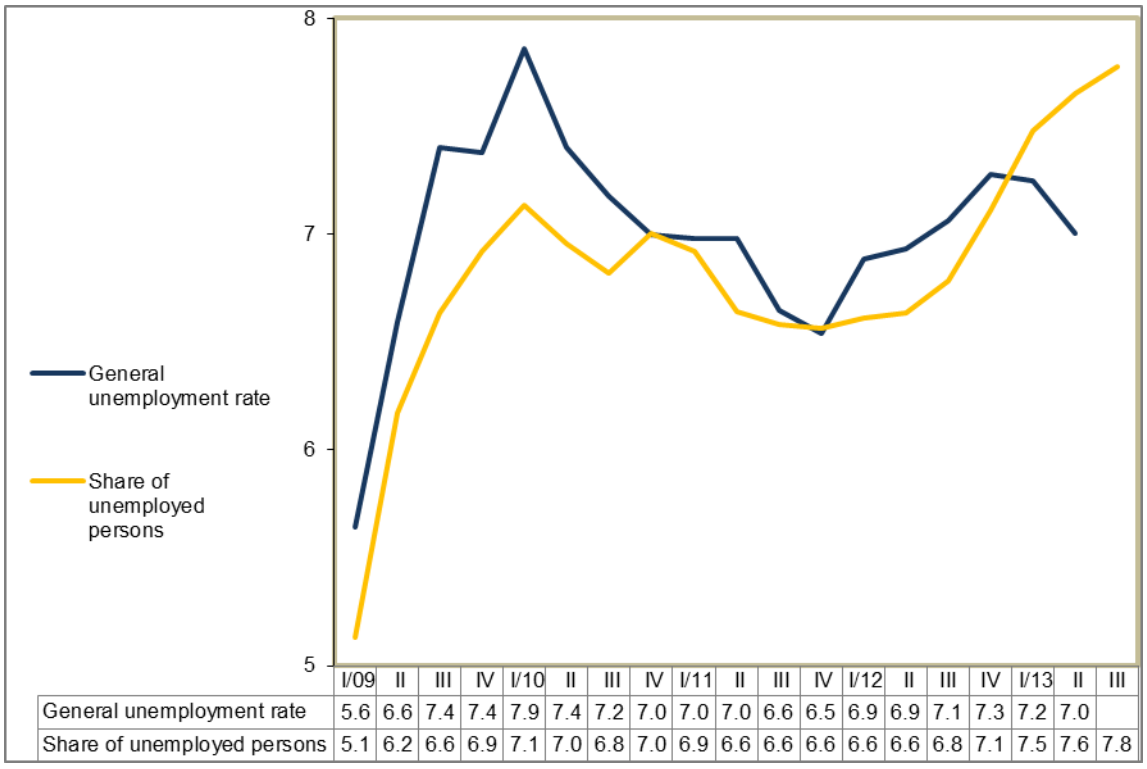
Source: Own representation, data from (CNB, 2013)

The horizontal axis of the graph is the quantification of the time series since the beginning of 2009 to the third quarter of 2013. The vertical axis is the contribution of net exports to GDP growth. The value of net exports is represented by blue columns. The graph shows that during this period the net exports were a great indicator of GDP growth in the Czech economy. By the end of 2012 the growth of net exports significantly decreased and in the beginning of 2013 there was a decline of the growth with increase in the middle of 2013 caused by high revenues from foreign direct investments. This component of GDP is very important for a later analysis of the effects of the FX interventions instrument. Support of Czech exporters was one of the reasons, why Czech national bank begun to intervene on FX market. However, as it was explained in theoretical part, exchange rate depreciation should be done in case of long-term decrease of export (or increase in import) or in cases that export is stagnating. The indication would be decreasing tendency of net export indicator. Nevertheless, as was mentioned, there was an increase in net exports at the second quarter of 2013. From that perspective, FX interventions were not a relevant instrument to use.

4.4 Labour Market Development

The development on labour market in the Czech Republic will be described in the graph below showing the general unemployment rate and share of unemployed persons.

Graph 13 The general unemployment rate and share of unemployed persons in 01/2009-09/2013



	I/09	II	III	IV	I/10	II	III	IV	I/11	II	III	IV	I/12	II	III	IV	I/13	II	III
General unemployment rate	5.6	6.6	7.4	7.4	7.9	7.4	7.2	7.0	7.0	7.0	6.6	6.5	6.9	6.9	7.1	7.3	7.2	7.0	
Share of unemployed persons	5.1	6.2	6.6	6.9	7.1	7.0	6.8	7.0	6.9	6.6	6.6	6.6	6.6	6.6	6.8	7.1	7.5	7.6	7.8

Source: Own representation, data from (CNB, IV/2013)

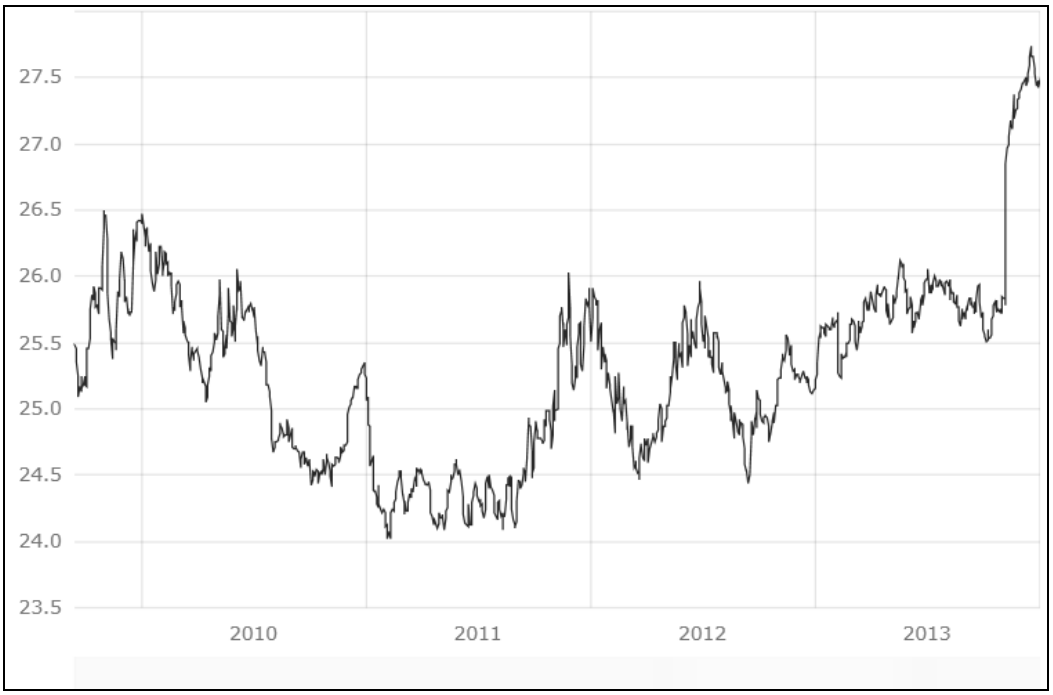
The horizontal axis indicates time values since the beginning of 2009 to the third quarter of 2013. The vertical axis shows the percentage change of general unemployment rate and share of unemployed people. The general unemployment rate is calculated as a percentage by dividing the number of unemployed individuals by all individuals in the country. The share of unemployed persons is measured as a percentage by dividing the number of unemployed individuals in the age 15-64 years divided by the number of inhabitants in the age 15-64 years. The general unemployment rate fluctuated from 5.6 % to 7.9 %, the lowest unemployment rate was in the first quarter of 2009 and the highest a year later. The share of unemployed persons was always below the general employment rate except

the year 2013 when the percentage of unemployed persons of the economically active inhabitants was higher and hit 7.5 % in the first quarter, continued with 7.6 % and 7.8 % in the next two quarters.

4.5 Development of Exchange Rate CZK/EUR

The graph below shows the exchange rate of CZK/EUR from the second half of 2009 till the end of 2013.

Graph 14 Development of exchange rate CZK/EUR 01/2009-12/2013



Source: (ECB,2016)

The horizontal axis shows the time period from 2009 to 2013. On the vertical axis there are values of CZK/EUR exchange rates. The development of the exchange rate shows that it was moving between 24 CZK/EUR and 26.5 CZK/EUR before CNB started the interventions. CNB´s Bank Board decided to use the exchange rate as a monetary policy instrument and therefore the initiation of foreign exchange intervention, on 7 November 2013. Weakening of CZK lead to the increase in import prices, and thus the overall price level in the country.

4.6 Assessment of the economic indicators development

The Czech economy was not performing well prior to the third quarter of 2013. Gross domestic product was already for one and a half year below zero (there was negative economic development) working below its potential, unemployment was slightly increasing, foreign trade was stagnating and inflation was dangerously declining and with interest rates at technical zero level, there were not any traditional instruments for the Czech national bank to reverse this trend. Along with the development of those fore-mentioned indicators there were also very low inflation expectations on the market creating pressure against consumption and investments. Those indicators were posing a real threat for Czech economy to fall into deflation and possible even further into deflation trap. The role of the central bank is to prevent this from happening. As it was already described in the theoretical part, deflation trap/spiral (if caused by negative demand shock) usually happens in time of recession or economic crisis when there is negative inflation on the market and also economic assets are declining due to decrease in aggregate demand. Declining aggregate demand indicates lower price level, production, salaries or employment causing overall product (GDP) to decrease. As an effect of lower inflation households postpone their consumption and firms postpone their investments in the expectations of further decrease in prices. Subsequently, the savings are increasing. Another danger lies in repayment of debts. In relationship between debtors and creditors, deflation brings increase of real debt value (decrease in credit value) that the debtor is obliged to return. There is a threat that the debtors will not be able to repays their debts and creditor is threatened by credit default swaps, bankruptcy or necessary firm restructuration. In other words, deflation causes shift of wealth distribution from debtors to creditors. Overall effects of deflation affect not only inhabitants and firms, but also banks and government and all economic subject on the market. It is simply a situation when economy is generating larger and larger loss. (CNB, 2013)

5 Foreign exchange interventions of CNB in 2013

On 7.11.2013 Czech national bank announced that they will start intervening on foreign exchange market against EURO currency. Despite the fact that in 2012 Czech national bank announced that they might have to use foreign exchange interventions as a monetary policy tool and they were already using verbal interventions, it was surprising for the general public. It was first significant intervention in more than ten years and some economists considered it as a shift towards fixed exchange monetary regime. (KLAUS, 2013)

The main objectives of the FX interventions were three:

- Reaching inflation target of 2 %.
- Support the growth of GDP.
- Quicken the return to 2W repo rate as a main monetary policy instrument

However, the main reasoning behind the intervention was fight against deflation threat. Czech national bank was trying to prevent deflation threats since the world economic crisis in 2008 and economic recession connected with it by gradually lowering the interest rates on the market until they reached level of 0,05 %, which is technical zero. Because the interest rate monetary policy tools were basically depleted, CNB had to turn into some other instruments, so that foreign exchange interventions were chosen. The governor of CNB Miroslav Singer defeated the decision by stating that it would be necessary at that point to decrease interest rates by another 0.9 % to fight the deflation. Since the interest rate would reach -0.85 %, which is not technically possible, FX interventions were chosen. (Singer, 2013)

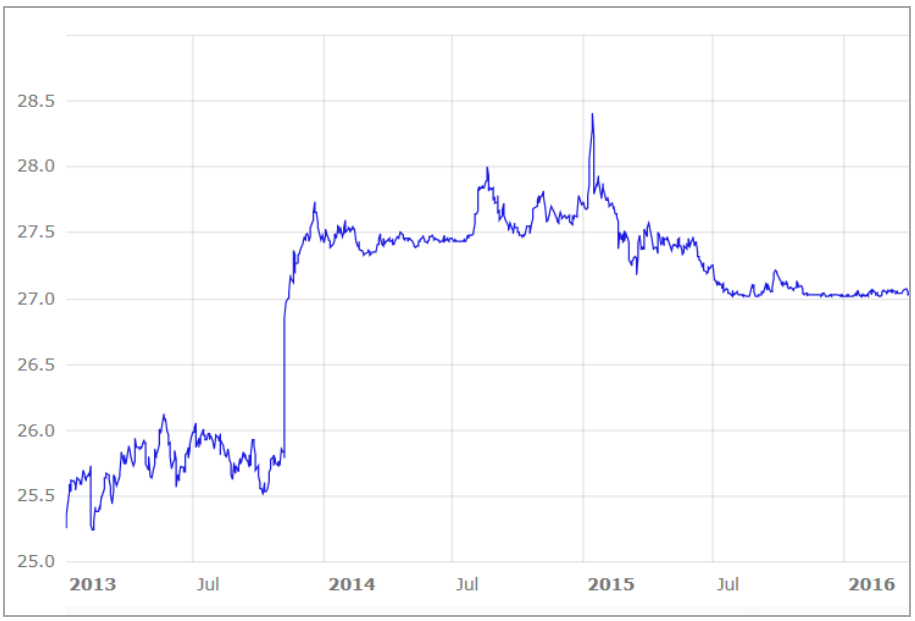
5.1 The timeline of FX interventions

As was mentioned, the CNB started to intervene against EURO on foreign exchange market on 7.11.2013. The target was set to sustain the exchange rate above 27 CZK/EUR. The first expense was in the amount of approximately 200 bills. CZK, meaning that CNB

released 200 bill. CZK onto the market and withdrew the equivalent in EUROs into its reserves. That led to the depreciation of CZK above required exchange rate and also supported inflation pressures by throwing more currency onto the market. Czech national bank decided to use so called “asymmetric commitment” in other word CNB would not intervene against further depreciation of CZK, however it would take measures against its appreciation below 27 CZK/EUR. Until 2015 it was not necessary to intervene further, but in March 2015 CZK/EUR exchange rate begun to move towards the bottom commitment rate, specifically 27.3 CZK/EUR and CNB was considering further interventions. Eventually, situation settled down until 20.7.2015 when exchange rate reached level of 26,997 CZK/EUR and CNB had to intervene. During July 2015 CNB intervened in the amount of 28 bills. CZK and later on another 100 bills. CZK. (CTK, 2015)

Following graph shows the development of CZK/EUR exchange rate from 2013 – 2016. At the beginning of 2016 the exchange rate kept slightly above the 27 CZK/EUR rate and the Czech national bank announce possibility of further interventions.

Graph 15 Development of exchange rate CZK/EUR 2013-2016



Source: (ECB, 2016)

At the beginning of FX interventions, CNB intended to keep its commitment until beginning of 2015, however the necessity for interventions was gradually prolonged until today, when the estimate for exiting the intervention regime is the beginning of 2017 – second quarter of 2017. The exit from intervention regime is very much dependent on Bank Board's decision and some of the members (along with the governor) will be changed as their mandate will expire. However the main objective of CNB is still reaching target inflation of 2 %, so the interventions are likely to continue until the deflation pressures will be eliminated. (Bednarik&Fiserova, 2015)

5.2 Criticism of the intervention regime

Introduction of the FX intervention regime by the Czech national bank has many supporters but also many critics. The main arguments against the interventions are basically two:

- There was no threat of deflation to the Czech economy.
- Even if the threat of deflation was real, it would be the harmless deflation caused by positive supply shock.

One of the main critics of the interventions is former Czech president and economist Václav Klaus. According to his book on this very topic called "Was the deflation really a threat?" , Mr. Klaus disagree with the FX intervention regime and considers it very risky and very wrong for several reasons:

- Economic and monetary policy on the Czech market is within past five years quite unstable and unclear due to the economic stagnation and CNB should not increase the uncertainty by using unconventional monetary instruments with unclear outcomes.
- Even though the situation around economic stagnation and its original cause is uncertain, it is clear that the cause is not the insufficient money supply, but the behaviour of CNB.

- Direct foreign exchange interventions have negative effect on import prices and causes inflation pressures which he considers wrong.
- Mr. Klaus sees the concept of inflation targeting as a wrong thing. The whole inflation targeting regime is based on future predictions of price level by CNB which is very uncertain and dangerous. Causing rather "under-targeting" of inflation targets.
- Inflation target is designed by CNB. So the reasoning that the interventions are necessary to reach inflation target does not make sense.
- The interventions are not needed. The path to the economic prosperity lies in good government fiscal policy and effective budgeting.
- There is a lack of demand for consumer goods, export and investment on the Czech market
- The deflation is not a threat to Czech economy, the threat is in the absence of economic growth.

To summarise it, Vaclav Klaus considers the motive of CNB to intervene on the FX market only in the necessity to show off after the traditional monetary policy instruments were depleted.

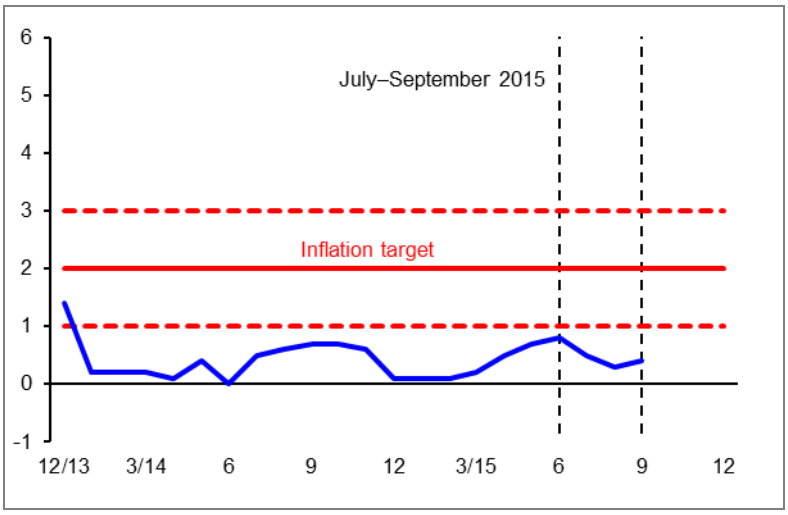
5.3 Influence of interventions on the Czech economy

The main objectives of the FX interventions issued by the Czech national bank on 7.11.2013 were to reach the inflation target of 2 % so that it can return to its standard monetary policy tools and increase the dynamics of GDP. This chapter will analyse the development of the macroeconomic indicators influencing those objectives. It is devoted particularly to inflation rate development, GDP growth, foreign trade development and unemployment rate plus the development of exchange rate of CZK towards EURO.

5.3.1 The development of the inflation rate

The development of inflation rate can be best described by the graph below, showing the development of inflation rate based on consumer price index from December 2013 to September 2015.

Graph 16 Development of inflation rate in the Czech Republic 12/2013 - 9/2015



Source: (CNB, 2015)

The horizontal axis shows the quarters of the year from December 2013 beginning of the interventions) to September 2015. Vertical axis shows the values of consumer price index in percentage. The red line represents inflation target set at 2 % by the Czech national bank. The dashed lines at 3 % and 1 % represent the tolerance band for the actual inflation rate. The blue line indicates the development of inflation rate. The inflation rate was below the CNB´s target in 2013 and this trend continued also in 2014 and 2015.

Following table shows the items of consumer price index with its quarterly contribution to the inflation rate in the economy. Regulated prices include for example medicine, electricity; gas, etc. simply the goods with prices regulated by government. Indirect taxes influence is mainly the impact of changes in value added tax (VAT). Food prices and fuel prices need no further explanation. Adjusted inflation excluding fuel prices is defined as price level increase without regulated prices, indirect tax influence, food prices and fuel prices. It mostly displays the growth in the price of consumption goods. Adjusted inflation

is mostly influenced by the level of consumption and investments. It more or less represents the GDP development. (Singer, 2015)

Table 3 Items of consumer price index with its contribution to inflation rate (2013-2015)

Inflation Report	IV/2013	I/2014	II/2014	III/2014	IV/2014	I/2015	II/2015	III/2015
CONSUMER PRICES	1,1	0,2	0,2	0,6	0,5	0,1	0,7	0,4
Breakdown into contributions:	%	%	%	%	%	%	%	%
Regulated prices	1,3	-4,1	-3,6	-2,2	-2,1	0,2	0,3	-0,2
Indirect taxes influence	0,7	0,1	0,2	0,1	0,1	0,2	0,3	0,2
Food prices	2,3	3,5	1,4	1,6	0,7	-0,9	0,7	0,3
Fuel prices	-1,7	0,3	1,0	0,5	-1,2	-14,6	-10,1	-0,4
Adjusted inflation excl. fuel prices	-0,4	-0,2	0,4	0,8	0,9	1,1	1,1	-0,4

Source: Own representation, data from: (CNB 2016)

By the end of the year 2013 the inflation rate reached 1.1 % which is the bottom line of the inflation target tolerance band. In the first quarter of 2014 the inflation rate fell to 0.2 %. This decline was most likely caused by the decrease of regulated prices into the negative year-to-year growth. Another item pressuring against inflation were the negative impact of indirect taxes (lowering of value added tax) and low fuel prices. On the other hand the indicator of inflation growth was the food prices that increased due to higher import prices caused by the interventions.

In the second quarter of 2014 remained unchanged on the level of 0.2 %. Decrease in regulated prices was the main cause of deflation pressures. On the other hand adjusted inflation without fuel prices increased indicating inflation pressures caused by strengthen GDP growth. Prices of food were increasing only slightly because the increased import prices after the intervention reached its equilibrium.

In the third quarter of 2014 inflation increased to 0.6 %. This was caused mainly because of adjusted inflation without fuel prices increase. That was caused by increase in domestic demand which proves the positive change in inflation expectations. This can also be seen by increase in consumption and investments. Simply the households and firms ceased to expect further decrease in prices and started spending.

In the fourth quarter of 2014 and first quarter of 2015 the inflation rate fell to 0.5 % respectively 0.1 % which was caused again by further decline in fuel prices on the world market and decrease of food prices.

In the second half of 2015 inflation increased to 0.7 % respectively 0.4 % driven mainly by increase in fuel prices and adjusted inflation despite still decreasing fuel prices.

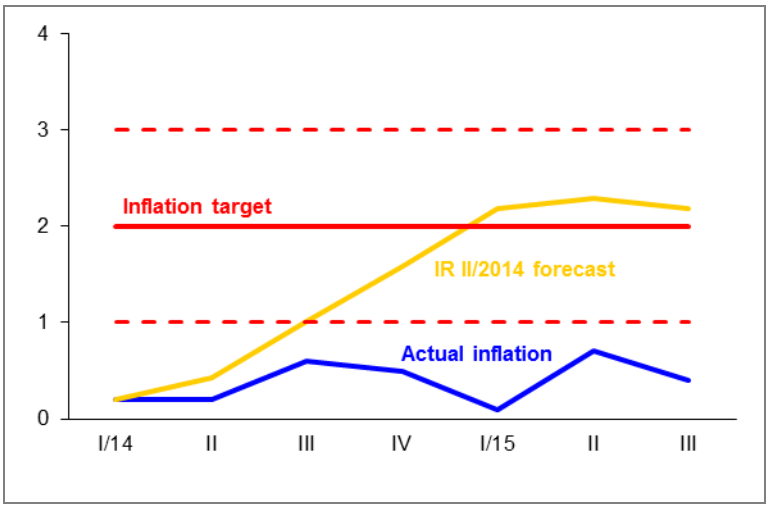
So from the breakdown of inflation rate between 2013 - 2015 it is visible that following economic changes occurred concerning inflation:

- Increase in import prices.
- Increase in inflation expectations.
- GDP growth (proved by adjusted inflation development).

However Czech economy still by far has not reached the 2 % inflation target. Nevertheless, this does not prove the failure of interventions as the adjusted inflation was increasing. The reason is external environment, in particular extreme decline in fuel prices on the world market. It is probable that without interventions the inflation would decline into negative level.

The chart below shows the CNB´s predicted inflation rate versus the actual inflation rate. It is obvious that CNB expected that the depreciation of the exchange rate will act more quickly to help the inflation move back to the inflation target.

Graph 17 Forecast versus actual inflation



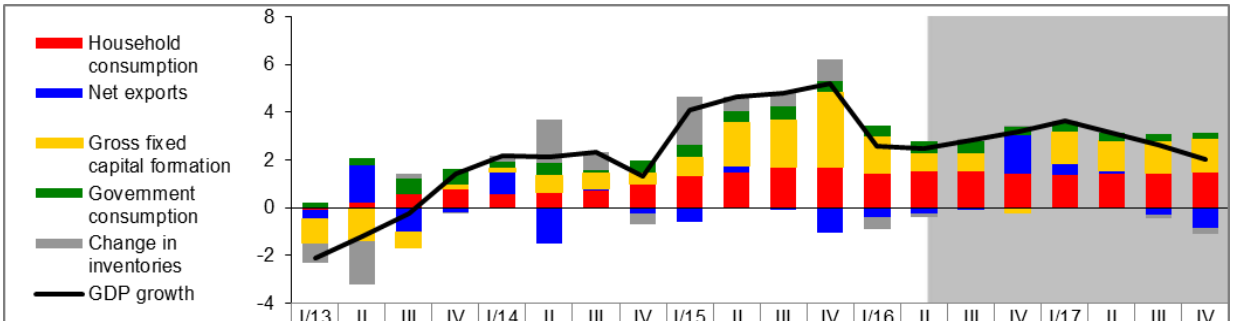
Source: CNB, 2015

Headline inflation decreased slightly in 2015 Q3 and still remains far below the CNB's inflation target.

5.3.2 The Developments of the annual GDP growth

The graph below shows the structure of the annual growth of GDP from January 2013 till December 2015 and also the prediction of CNB for years 2016 and 2017.

Graph 18 Annual GDP growth structure



	I/13	II	III	IV	I/14	II	III	IV	I/15	II	III	IV	I/16	II	III	IV	I/17	II	III	IV
Change in inventories	-0.8	-1.9	0.2	0.0	0.2	1.8	0.7	-0.5	2.0	0.6	0.6	0.9	-0.5	-0.1	0.1	0.0	0.1	0.0	-0.2	-0.3
Government consumption	0.2	0.3	0.7	0.7	0.3	0.5	0.1	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3
Gross fixed capital formation	-1.0	-1.4	-0.6	0.2	0.2	0.7	0.7	0.5	0.8	1.8	2.0	3.1	1.5	0.7	0.8	-0.2	1.3	1.3	1.3	1.4
Net exports	-0.4	1.6	-1.0	-0.2	0.9	-1.5	0.1	-0.2	-0.6	0.3	-0.1	-1.0	-0.4	-0.2	-0.1	1.6	0.5	0.1	-0.3	-0.8
Household consumption	-0.1	0.2	0.6	0.8	0.6	0.6	0.7	1.0	1.4	1.5	1.7	1.7	1.4	1.5	1.5	1.4	1.4	1.4	1.4	1.5
GDP growth	-2.1	-1.2	-0.3	1.4	2.2	2.1	2.3	1.3	4.1	4.6	4.8	5.2	2.6	2.5	2.8	3.2	3.7	3.1	2.6	2.0

Source: Own representation, data from (CNB, 2015)

The horizontal axis shows the time period from beginning of 2013 till the third end of 2015. The prediction of CNB for 2016 and 2017 is highlighted in light grey. The columns show the development and structure of the quarterly GDP growth in %. The black curve represents the overall GDP growth. All data for each quarter are shown in the table below the chart.

The GDP growth decline in 2013 was driven by the development of gross capital formation, the contributions of other components were generally negligible. In 2013, real economic activity has decreased, household consumption rose slightly and positive net exports also contributed to GDP growth. Above them prevailed, however, significantly negative contribution of gross capital formation. In the beginning of 2014 all components of GDP were positive and contributed to the higher GDP growth which continued in 2015. The GDP quarter growth reached 4.1 % in first quarter of 2015 and rose up to 5.2 % in last quarter of 2015. This was caused by the growth of fixed capital formation and continued household consumption.

CNB predicts that in 2016 the GDP growth will slow to 2.8 %. It will be caused by the drop in government investment as a result of termination of the possibility of drawing EU funds from the previous programming period and only the gradual rise of the new programming period. The increase in inventories from the beginning of 2015 and the fall in oil prices will also contribute to the economic slowdown. To GDP growth in 2016 will contribute all its components, especially household consumption and private fixed investment. In 2017, GDP growth will accelerate slightly to 2.9 % with positive contributions from all components of domestic demand, while net exports will slightly dampen the GDP growth. (CNB, 2015).

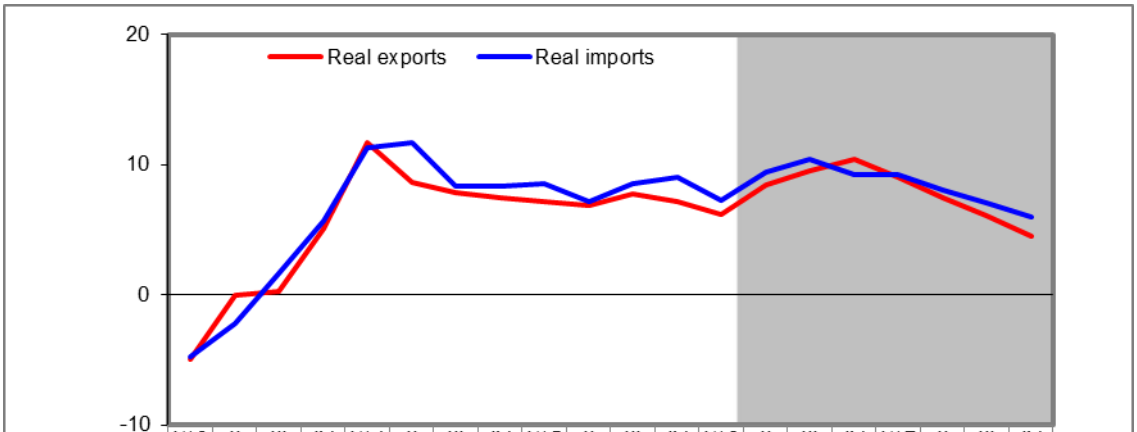
To summarise it, from the GDP growth development it is obvious that the interventions gave an impulse to strengthen domestic aggregate demand and reached one of its objectives and also encouraged overall economic activity within Czech economy. The breakdown of GDP growth rate from 2013 to 2015 shows following economic changes:

- Increase of net export.
- Increase of investments.
- Increase of consumption.
- Increase of government spending.
- Increase of GDP growth dynamics.

5.3.3 Development of foreign trade

The graph below represents the growth of annual percentage changes of import and export of goods and services between 2007 and 2015 and CNB´s prediction for 2016 and 2017.

Graph 19 The growth of import and export 2007- 2015 and prediction for 2016 and 2017.



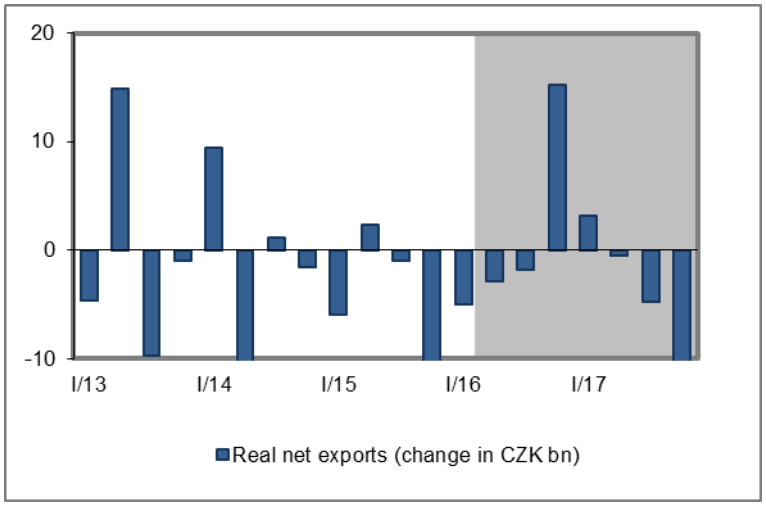
	I/13	II	III	IV	I/14	II	III	IV	I/15	II	III	IV	I/16	II	III	IV	I/17	II	III	IV
Real exports	-5.0	0.0	0.2	5.1	11.7	8.7	7.8	7.5	7.1	6.9	7.7	7.1	6.2	8.4	9.5	10.4	9.0	7.5	6.1	4.5
Real imports	-4.8	-2.2	1.7	5.7	11.3	11.7	8.3	8.3	8.6	7.1	8.5	9.0	7.3	9.4	10.4	9.2	9.2	8.0	7.0	6.0

Source: Own representation, data from (CNB, 2015)

The horizontal axis shows the time period (by quarters) from beginning of 2013 till the first quarter of 2016 with two year prediction until the end of 2017. The vertical axis represents the percentage change of exports and imports of goods and services.

The next chart shows the growth of net exports. Net export represents the important part of GDP. It is calculated as a difference between export and import.

Graph 20 The growth of net exports 2013-2017



Source: Own representation, data from (CNB, 2015)

The horizontal axis of the graph is the quantification of the time series since the beginning of 2013 to the third quarter of 2016 and prediction of CNB for the rest of 2016 and 2017 which is highlighted in light grey. The vertical axis is the contribution of net exports to GDP growth in bill. CZK. The value of net exports is represented by blue columns. Net exports represent an important part of GDP of the Czech Republic.

From the net export graph, there is obvious increase of net export in last quarter of 2013 first quarter of 2014 when the year-to-year export increased thanks to surplus of export over import. It is clearly visible from the foreign trade development graph. This supports another objective of FX interventions, which was encouraging Czech producers to export more. The main determinant of growth of export was increase in foreign demand for domestic goods and services. This was caused by relatively lower price of domestic goods and services for the foreign economic subjects. In the next quarters net export indicated decline, however it was not caused by significant decrease of export but rather by surplus of import over export. This is again clearly visible from the graph of foreign trade development. This trend continued until the first quarter of 2016. The dynamics of export growth was from the beginning of interventions increasing along with the growth of import. This was caused by the fact that Czech exporters were reacting on the increased

demand for their products by increasing demand for the intermediary products, which are often not part of domestic supply.

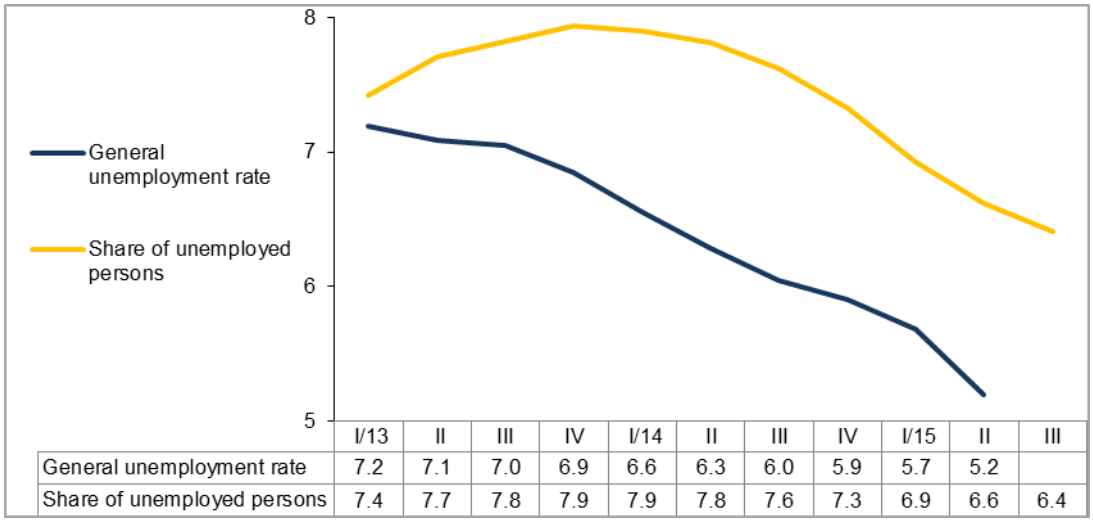
To summarise it, based on the net export and foreign trade development, following changes occurred:

- Growth of foreign demand for Czech exports.
- Growth of net exports. However the dynamics of net export was decreasing since first quarter of 2014.

5.3.4 Labour Market Development

The development on labour market is described in the graph below showing the general unemployment rate and share of unemployed persons.

Graph 21 The general unemployment rate and share of unemployed persons 2013-2015



	I/13	II	III	IV	I/14	II	III	IV	I/15	II	III
General unemployment rate	7.2	7.1	7.0	6.9	6.6	6.3	6.0	5.9	5.7	5.2	
Share of unemployed persons	7.4	7.7	7.8	7.9	7.9	7.8	7.6	7.3	6.9	6.6	6.4

Source: Own representation, data from (CNB, 2015)

The horizontal axis takes time values since the beginning of 2013 to the third quarter of 2015. The vertical axis shows the percentage change of general unemployment rate and share of unemployed persons. The general unemployment rate is calculated as a percentage by dividing the number of unemployed individuals by all individuals

in the country. The share of unemployed persons is measured as a percentage by dividing the number of unemployed individuals in the age 15-64 years divided by the number of inhabitants in the age 15-64 years.

Developments on the labour market were influenced by weakening of the economic activity in the first quarter of 2013. The general unemployment rate increased as well as the proportion of unemployed people. In 2014 the labour market was positively influenced by the continued growth in economic activity which helped to decrease the general unemployment rate and the number of unemployed people. In the fourth quarter of 2014 the unemployment rate fell below 6 %.

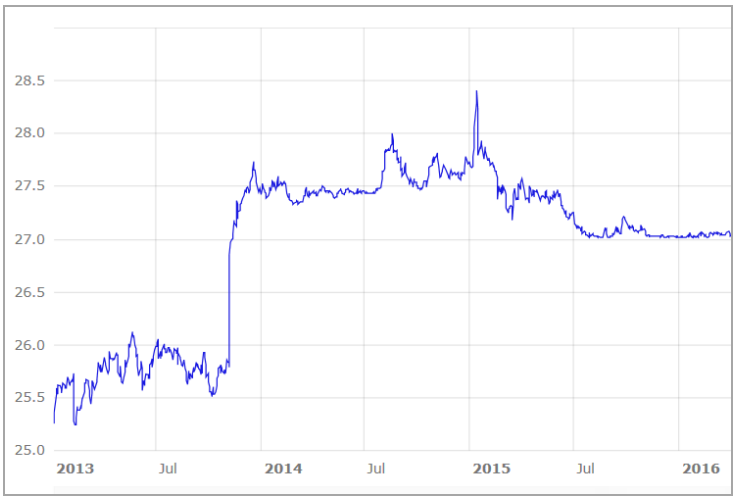
Labour market developments indicated a continuing increase in the demand for labour and reinforcing economic growth in 2015. The growth of total employment and the number of employees converted to full-time jobs in the second quarter of 2015 further accelerated, the proportion of unemployed persons also declined during the third quarter of 2015.

Development of unemployment rate is directly influenced by the GDP growth. If GDP grows, consumption grows, firms have higher profits and invest more causing increase in production and also employment. According to the development of unemployment rate, the foreign exchange interventions had without doubts positive effect on the employment in the Czech Republic.

5.3.5 Development of Exchange Rate CZK/EUR

Following graph shows the development of CZK/EUR exchange rate.

Graph 22 The development of CZK/EUR exchange rate 2013-2016



Source: (ECB, 2016)

The horizontal axis shows the time period from 2013 to February 2016. On the vertical axis there are values of CZK/EUR exchange rates. Immediately after the beginning of FX interventions by CNB CZK depreciated above the target of 27 CZK/EUR and kept above it until March 2015 when CZK/EUR exchange rate begun to move towards the bottom commitment rate, specifically 27.3 CZK/EUR and CNB was considering further interventions. Eventually, situation settled down until July 2015 when exchange rate reached level of 26,997 CZK/EUR and CNB had to intervene. During July 2015 in the amount of 28 bill. CZK and later on another 100 bill. CZK. Ever since the exchange rate sustain slightly above 27 CZK/EUR. (CTK, 2015)

5.4 CNB´s Economic Development forecasts

Czech National Bank announced their prediction for several macroeconomic indicators on February 4, 2016. The forecast for the annual GDP growth is summarized in the table below. The CNB predicts that the growth will be 4.7 % in 2015, 2.7 % in 2016 and 3 % in 2017. It is predicted that GDP will slow markedly in 2016 due to a drop in government investment financed from EU funds.

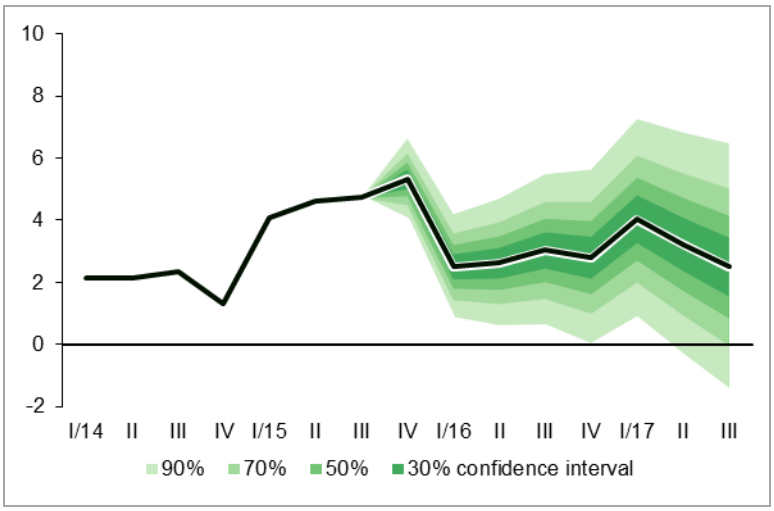
Table 4 Annual GDP growth forecast 2015-2017

Indicator	Horizon	Forecast
Annual GDP Growth	2015	4.7 %
	2016	2.7 %
	2017	3.0 %

Source: Own representation, data from CNB, 2016

The chart captures the uncertainty surrounding the future evolution of the seasonally adjusted GDP growth. The vertical axis shows the annual GDP growth in % and the horizontal axis the period between first quarter of 2014 to third quarter of 2017. The darkest green band around the black curve of the forecast shows the developments that can occur with 30 % probability. The widening bands in lighter green successively show the developments which can occur with the probability of 50 %, 70 % and 90 %.

Graph 23 The forecast of GDP growth



Source: Own representation, data from CNB, 2016

The forecasted interest rate for 2016 is 0.3 % and 0.9 % in 2017. The forecast expects market interest rates to be flat at their current low level until the end of 2016 and increased for 2017.

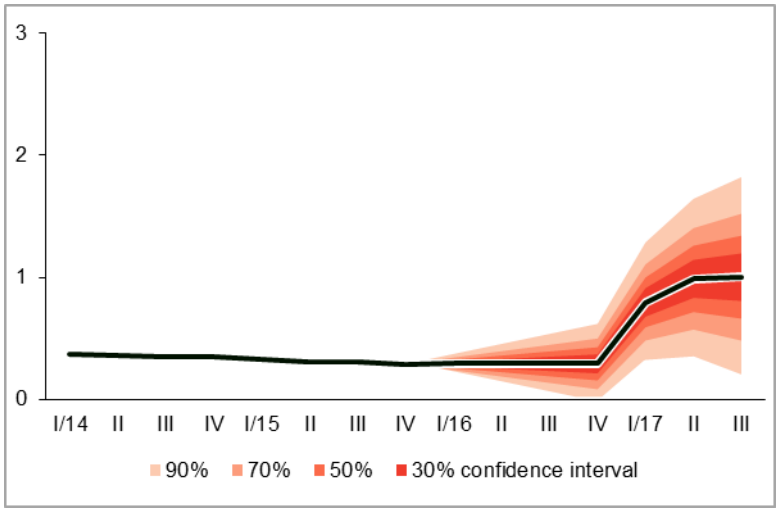
Table 5 Interest rate forecast 2016-2017

Indicator	Horizon	Forecast
Interest rates 3M PRIBOR	**2016**	**0.3 %**
	2017	**0.9 %**

Source: Own representation, data from CNB, 2016

The chart below captures the uncertainty surrounding the future evolution of interest rates. The vertical axis shows the interest rates in % and the horizontal axis the period between first quarter of 2014 to third quarter of 2017. The darkest red band around the black curve of the forecasted interest rate shows the developments that can occur with 30 % probability. The widening bands in lighter red show the developments which can occur with the probability of 50 %, 70 % and 90 %.

Graph 24 Interest rate forecast



Source: Own representation, data from CNB, 2016

According to the forecast, annual inflation will gradually increase, hitting the 2 % target in the first half of 2017 and then moving slightly above it to 2.1 % in the second quarter of 2017.

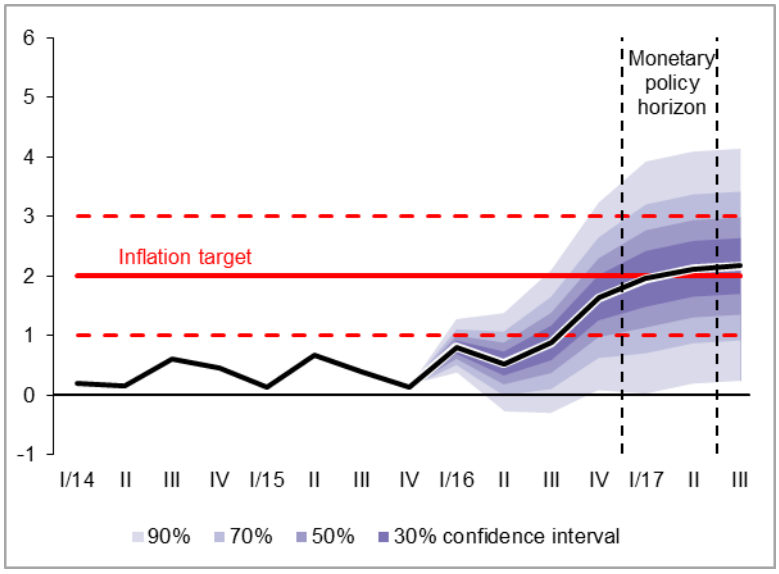
Table 6 Annual consumer price inflation forecast 2017

Indicator	Horizon	Forecast
Annual consumer price inflation	**2017, Q1**	**2.0 %**
	2017, Q2	**2.1 %**

Source: Own representation, data from CNB, 2016

The chart captures the annual consumer price inflation and the uncertainty surrounding the future evolution in first and second quarter of 2017. The darkest band in dark violet around the black curve of the forecasted annual inflation shows the developments that can occur with 30 % probability. The widening bands in lighter violet show the developments which can occur with the probability of 50 %, 70 % and 90 %.

Graph 25 Annual consumer price inflation forecast 2017



Source: Own representation, data from CNB, 2016

5.5 Assessment of the economic indicators development after FX interventions

Based on the analysis of the macroeconomic indicators influencing objectives of CNB's foreign exchange interventions following changes occurred between years 2013-2016:

- Increase of import prices.
- Increase of inflation expectations.
- GDP growth as a main indicator of economic growth.
- Increase in consumer price index.
- Inflation target of 2 % have not been met.
- Objective of quick return to standard monetary policy instruments (interest rate adjustment) have not been met.
- Increase in foreign demand for domestic goods and services.
- Increase of net export.

- Increase of investment and consumption.
- Increase of GDP growth dynamics.
- Positive development of employment.

Foreign exchange interventions conducted by Czech national bank had without doubts positive effect on all analysed macroeconomic indicators. GDP growth had positive effect on revitalization of Czech economy. As for the inflation rate, FX interventions clearly eliminated the deflation pressures in favour for pro-inflation movement. However, the inflation target of 2 % set by the Czech national bank has not been met mostly because of external factors such as low fuel prices. Because of insufficient inflation rate, CNB could not yet increase the interest rates and return to the standard monetary policy regime.

Conclusion

The main objective of this thesis was to analyse the foreign exchange monetary interventions introduced by the Czech national bank at the end of year 2013 and its impact on the main macroeconomic indicators of the Czech Republic's economy.

In the first chapter, the role of the Czech national bank was introduced. The key role of the Czech national bank is among others ensuring the price stability in the economy. The secondary role is to support general economic policies of the government which leads to sustainable economic growth. The second role should be performed only in case it does not prejudice the main target. The essential prerequisite for implementation of monetary policy is the independence of the central bank.

The first part of the second chapter introduced the monetary policy regimes that central banks adopt. Ever since year 1998 the Czech national bank uses the inflation targeting regime. In this regime the Czech national bank uses short term nominal interest rates and inflation expectations as an instrument to influence the inflation rate. In the inflation targeting regime the inflation rate expresses the main indicator of economic development. For this reason the Czech national bank issues quarterly complex inflation report. Currently the Czech national bank uses the inflation target of 2 % with 1 % tolerance band as this rate is considered to be the indicator of sustainable economic growth. Creating of inflation expectations is the crucial thing in the inflation targeting regime, because monetary policy instrument affects the economy with certain time lags.

The monetary policy instruments affect the economy through transmission mechanisms which is the chain of economic effects. The Czech national bank uses monetary transmission mechanism, interest rate transmission mechanism and exchange rate transmission mechanism which is the most important in exchange rate interventions regime.

To achieve its objectives the Czech national bank uses the monetary policy instruments. The main and traditional instruments used in the inflation targeting regime are the ones that influence short term nominal interest rates through which the Czech national bank affect

the overall output of the economy. Mainly inflation, consumption, investments, aggregate demand and gross domestic product. Another untraditional monetary policy instrument that the Central bank might use are foreign exchange interventions.

Deflation, as a decrease in price level, was the main reason behind the decision of the Czech national bank to use foreign exchange interventions. They were forced to use this instrument because the traditional interest rate instruments failed.

The situation on the Czech market prior to the interventions was not satisfactory. Inflation rate was suffering from the deflation pressures and was declining, the same development was followed by the gross domestic product growth which had reached negative values several times. The foreign trade had decreasing tendencies and by the end of 2012 net export had negative effect on the economic output. Moreover, the general unemployment rate suffered from quick increase since the end of 2011. At that time the exchange rate of CZK/EUR was oscillating around 25 CZK/EUR.

For the above mentioned reasons, deflation pressures and inability to use the interest rate adjustment as a monetary policy instrument (it already reached technical zero) on 7.11.2013 the Czech national bank begun to intervene on the foreign exchange market against EUR in order to offset the negative economic development tendencies. The goal was set to keep the exchange rate above the level of 27 CZK/EUR.

Now it has been more than two years since the interventions started. The impact of the interventions on the Czech economy is already obvious. As for the development of the inflation rate the increase of import prices and inflation expectations were achieved. However, the Czech economy still by far has not reached the 2 % inflation target and stayed behind the Czech national bank inflation estimates. Nevertheless, this does not prove the failure of interventions as the adjusted inflation rate was increasing. The reason for insufficient growth of the inflation rate is the external environment, in particular extremely low prices of petrol on world markets. As for the GDP growth development, the significant increase has been achieved. It is obvious that the interventions gave the economy an impulse to strengthen domestic aggregate demand and reached the Czech national bank’s target. Moreover, increase of net export, investments consumption

government spending and GDP growth dynamics has been achieved. Foreign trade development is still quite unclear as lot of changes occurred. There has been growth of foreign demand for Czech export and growth of net exports. However the dynamics of net export was decreasing since first quarter of 2014 with few surpluses of import. The development on the labour market is good as the unemployment rate has been constantly decreasing since the third quarter of 2013.

Regarding the Czech national bank economic development forecasts the overall output of the Czech economy is positive. By the year 2017 it is expected for the Czech economy to reach GDP growth of 3 % and to reach the inflation target of 2 %. Furthermore, the short term nominal interest rate should increase up to 0.9 %. At that point the foreign exchange interventions would not be needed anymore, because the Czech national bank can return to using its traditional monetary policy instrument.

Primary hypothesis of this thesis was that the foreign exchange interventions introduced by the Czech national bank had positive impact on the Czech economy and contributed to the inflation rate and gross domestic product growth. At this point it is difficult to evaluate the overall impact of the foreign exchange interventions because all of the initial objectives have not been met yet. However, the overall trend seems to be positive.

References

Literature.

- Durcakova, Jaroslava & Mandel, Martin.(2010) *Mezinárodní finance*. 4., aktualiz. a dopl. vyd. Praha: Management Press, , 494 s. ISBN 978-80-7261-221-5.
- Friedman, Milton, (1970) *The Counter-Revolution in Monetary Theory*. IEA Occasional Paper, No. 33, 14 p
- Holman, Robert.(2010). *Makroekonomie: středně pokročilý kurz.* 2. vyd. Praha: C.H. Beck, 2010, xiv, 424 s. Beckovy ekonomické učebnice. ISBN 978-80-7179-861-3.
- Holman, Robert. (2005). *Ekonomie. 4.* aktualiz. vyd. Praha: C. H. Beck,. ISBN 80-7179-891-6.
- Jilek, Josef. (2004) *Peníze a měnová politika.* 1. vyd. Praha: Grada, 742 s. Finance (Grada). ISBN 80-247-0769-1.
- Kaza, Greg. (2006). *Deflation and Economic Growth.* The Quarterly Journal of Austrian. 2, p. 95.
- Klaus, Vaclav. (2014). *Byla deflace opravdu hrozbou?.* Vyd. 1. Praha: Institut Václava Klause, 44 s. Publikace (Institut Václava Klause). ISBN 978-80-87806-04-3.
- Lizal, Lubomir&Schwarz, Jiri. (2013). *Foreing exchange interventions as an (un)conventional monetary policy tool,* BIS Papers, No. 73, 2013
- Luskin, Donald. (2001). *Still Think Deflation's Just a Bugaboo?* Trend Macrolytics.

- Mandel, M.& Tomsik, V. *Monetární ekonomie v malé otevřené ekonomice*. Praha: Management Press. ISBN: 80-7261-094-5
- Reinert, K. and col. (2009). *The Princeton encyclopedia of the world economy*. Princeton: Princeton University Press, (p. 755-757). ISBN: 0-691-12812-X
- Revenda, Zbyněk.(2011). *Centrální bankovnictví*. 3., aktualiz. vyd. Praha: Management Press, 558 s. ISBN 978-80-7261-230-7.
- Sarno, Lucio&Taylor,P. Mark. (2003). *The economics of exchange rates.* 1st ed. Cambridge: Cambridge University Press, xii, 318 s. ISBN 0521481333.)

Online sources

- Bednarik, R.&Fiserova, M. (2015). *Slabá koruna bude i za Rusnoka. Budoucí guvernér ČNB má na intervence jiný názor než prezident*. Hospodářské noviny. [online] Available at: http://archiv.ihned.cz/c1-64605380-slaba-koruna-bude-i-za-rusnoka-budouci-guverner-cnb-ma-na-intervence-jiny-nazor-nez-prezident. [Accessed 2 April 2016].
- Buiter, Willem H. (2003). *Should We Worry about Deflation? Prevention and Cure.* [online] Available at: http://www.willembuiter.com/mckenna.pdf. [Accessed 25 March 2016].
- CNB, (2016). *Menova politika*. [online] Available at: http://www.cnb.cz/cs/menova_politika/. [Accessed 15 February 2016].
- CNB, (2013). *Zpráva o inflaci – IV/2013*. [online] Available at: www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/menova_politika/zpravy_o_inflaci/2013/2013_IV/download/zoi_IV_2013.pdf. [Accessed 5 April 2016].
- CNB, (2015). *Zpráva o inflaci – IV/2015*. [online] Available at: http://www.cnb.cz/cs/menova_politika/zpravy_o_inflaci/2015/2015_IV/zoi_2015_IV_grafy.html . [Accessed 5 April 2016].

- CNB, (2016). *Uplne zneni zakona c. 6/1993 Sb., o Ceske narodni bance, ve zneni pozdejsich predpisu* , [online] Available at: https://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/legislativa/zakony/download/zakon_o_cnb.pdf. [Accessed 17 February 2016].

- CNB, (2016). *Aktuální prognóza ČNB*, [online] Available at: https://www.cnb.cz/cs/menova_politika/prognoza/index.html?cnb_css=true [Accessed 10 April 2016].

- CNB, (2016). *The main instruments of monetary policy*, [online] Available at: https://www.cnb.cz/en/monetary_policy/instruments/#omo. [Accessed 5 February 2016].

- CNB, (2016). *What are the regimes of monetary policy?* [online] Available at: https://www.cnb.cz/en/faq/what_are_the_regimes_of_monetary_policy.html. [Accessed 17 February 2016].

- CNB, (2016). *Inflation targeting in the Czech Republic*. [online] Available at: https://www.cnb.cz/en/monetary_policy/inflation_targeting.html. [Accessed 17 March 2016].

- CNB, (2016). *CNB current forecast*. [online] Available at: https://www.cnb.cz/cs/menova_politika/prognoza/index.html?cnb_css=true. [Accessed 8 April 2016].

- CSO, (2016). *Zahraniční obchod ČR - měsíční údaje - leden 2016*. [online] Available at: https://www.czso.cz/csu/czso/zahranicni-obchod-cr-mesicni-udaje-leden-2016. [Accessed 8 April 2016].

- CTK,(2015). *Intervence ČNB se v srpnu vyšplhaly na 100 miliard, nejvíc od roku 2013*. E15. [online] Available at: http://zpravy.e15.cz/burzy-a-

trhy/meny/intervence-cnb-se-v-srpnu-vysplhaly-na-100-miliard-nejvic-od-roku-2013-1233986) [Accessed 8 April 2016]

- ECB. (2016). *Transmission mechanism of monetary policy*. [online] Available at: https://www.ecb.europa.eu/mopo/intro/transmission/html/index.en.html. [Accessed 5 March 2016].
- ECB. (2016). *Euro foreign exchange reference rates.* [online] Available athttps://www.ecb.europa.eu/stats/exchange/eurofxref/html/eurofxref-graph-czk.en.html. [Accessed 5 April 2016]
- ECB. (2014). *Monetary Policy. European Central Bank.* [online] Available at: http://www.ecb.europa.eu/ecb/educational/facts/monpol/html/mp_007.en.html. [Accessed 5 March 2016].
- Mishkin, S. Frederik (1998), *International Experiences with Different Monetary Policy Regimes*. ISSN 0347-8769. [online] Available at: http://www.diva-portal.org/smash/get/diva2:328024/FULLTEXT01.pdf, [Accessed 15 February 2016].
- Rezabek, P. (2014). *Teorie a praxe měnové politiky ČNB*, CNB [online] Available at: http://khp.vse.cz/wp-content/uploads/2012/02/Teorie-a-praxe-m %C4 %9Bnov %C3 %A9-politiky- %C4 %8CNB.pdf. [Accessed 5 March 2016].
- Rezabek, P.(2007). *Úloha centrální banky v měnové politice a peněžním oběhu*. CNB [online] Available at: https://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/verejnost/pro_media/konference_projevy/vystoupeni_projevy/download/rezabek_20070828_libinst.pdf. [Accessed 5 February 2016].
- Rogoff, Kenneth. (2003). *Deflation, Determinants, Risks, and Policy Options – Findings of an Interdepartment Task Force*. International Monetary Fund. [online] Available at:

http://www.imf.org/external/pubs/ft/def/2003/eng/043003.pdf. [Accessed 5 March 2016].

- Singer, M. (2013). *Aktuální vývoj v české ekonomice a měnová politika* ČNB. [online] Available at: http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/verejnost/pro_media/konference_projevy/vystoupeni_projevy/download/singer_20131120_olomouc.pdf. [Accessed 1 April 2016].
- Singer, M. (2008). *Vysoká inflace je dočasná: cenový šok očima ČNB.* [video online] Available at: http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/verejnost/pro_media/konference_projevy/vystoupeni_projevy/download/Singer_20080416_VSE.pdf. [Accessed 20 March 2016].
- Trading Economics. (2016). *Czech Republic Consumer Price Index (CPI)*. [online] Available at: http://www.tradingeconomics.com/czech-republic/consumer-price-index-cpi. [Accessed 25 March 2016].