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Global financial crisis and monetary policies of central banks (examples of chosen countries)

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Declaration on word of honor:

I declare that I wrote the Master's thesis on the topic *"Global financial crisis and monetary policies of central banks (examples of chosen countries)"* independently and that all the literature and other sources I used are appropriately marked and cited.

In Prague, 09.12. 2010 Signature:

Annotation:

I would like to express my deep gratitude toward my professor Ing. Jaroslava Durčáková, CSc. who helped me with her precious advises and recommendations to not only stay on the right track but also to focus on important things and not to drown in cascading chapters.

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Introduction

For the purpose of this MT I will take two hypotheses and examine if they can be marked as valid. The two hypotheses are these:

1) Monetary policies of fixed rate regimes may encourage a creation of a financial crisis.

2) Foreign exchange reserves may help a country to get out of a financial crisis.

To be able to test these hypotheses I will at first sum up all the relevant theory about financial crises. At first I will talk about types of financial crisis ranging from monetary and banking crisis to a debt crisis. In addition to this classical approach I will talk about the combination of these crises - about the systemic crisis.

Then I will talk about the four generations of models that economists created to better understand causes of financial crises and about indicators of these financial crises. It is necessary to say that there is a large group of indicators which purpose is to indicate a possible financial crisis. But only some of the economic variables which are measured by these indicators can be directly or indirectly affected or changed by a central bank. I will talk mainly about those indicators on which the central bank can have its influence.

This leads me to the last part of the theoretical block where I want to talk about monetary policy. I spoke about the ability of central bank to have an influence on economic variables and thus I must describe what types of monetary policies there are. And because there are several monetary policies I want to focus mainly on those which are in any way connected to bringing me closer to finding a reasonable answer for the two hypotheses which I stated in the beginning of this chapter. This means that I will place greater emphasis on monetary policy of fixed exchange rate regimes than on any other policy.

In connection with the monetary policy I will talk about tools of monetary policy. There are again several tools of monetary policy at the disposal of a central bank. For the purpose of this MT I will focus especially on those which can affect economic variables measured by indicators of a financial crisis like interest rates, discount window lending, monetary base and reserve requirements. I will also talk shortly about non-conventional monetary policies as for example quantitative and credit easing.

The second block will be predominantly analytical. I have chosen to analyze four countries. Specifically I will analyze their monetary policy and actions they have taken in the current financial crisis and before its start. In the process of choosing of these four countries I focused on differences in monetary policy of these countries. This group of countries represents a diverse group of approaches to the monetary policy. It makes a great deal of sense to me to choose not only geographically different countries but also countries which vary in their political and economic systems. These four countries are China, Venezuela, Denmark and the Czech Republic.

The largest of all these countries – China – has experienced various forms of fixed exchange rate regimes and strong governmental influence. In the past decade it abandoned than reinstated and now announced to abandon again the fixed exchange rate regime.

Venezuela's monetary policy is also strongly influenced by the government. The economic development of Venezuela is though different and not as successful as in China. One thing I will focus more while analyzing Venezuela is a very high and persisting inflation.

Denmark is in contrast a small but developed economy. According to Ingrid Henriksen from University of Copenhagen small and open economy should use monetary policy of fixed exchange rate regime because it stabilizes the conditions for foreign trade and in contrast with a free floating regime it suppresses the exchange rate volatility.[1] And really the monetary policy used for most of the last century in Denmark was a fixed exchange rate regime.

And at last I will analyze monetary policy of the Czech Republic which developed from a fixed exchange rate regime to a free floating regime. This change was accompanied with a currency crisis which was triggered after a period of a strong appreciation of real effective exchange rate (REER), drop in growth of real exports and a marginal growth of ratio M2/foreign exchange reserves.[2]

I will take each of these four countries and start with describing historical and current development of their monetary policy. I will also look at a wide number of macroeconomic data (e.g. interest rates, money supply, foreign exchange reserves, inflation, ...), and analyze effects of different monetary policies.

At this moment I would like to say that I find one part of this analysis very interesting. It is the huge amount of foreign exchange reserves of China. I will analyze what role these reserves play and what role these reserves can play in the current financial crisis.

[1] Henriksen, Ingrid. "*An Economic History of Denmark*". EH.Net Encyclopedia, edited by Robert Whaples. October 6, 2006. URL http://eh.net/encyclopedia/article/henriksen.denmark

[2] Mandel, M. - Tomšík V.: *Monetární ekonomie v malé otevřené ekonomice.* 1. vydání, Praha, Management Press, 2003.

In the summary of my MT I will sum up all the important facts I encounter during the writing of the MT and discuss whether the two hypotheses which I stated in the beginning of my MT can be marked as valid or not. This will be quite demanding because global financial crisis is still in progress and I suspect it will be developing itself throughout the entire period while my MT will be written.

At last it is necessary to say that each country I have chosen for this MT is very different from the other ones. This is why I need to be careful in comparing the statistical data. Each country publicizes slightly different statistical data about its economy and thus it is important to use appropriate data in order for the analysis to be well done. As a main source of data I will use the International Financial Statistics (IFS) from International Monetary Fund (IMF) and also data directly from central banks of selected countries. There is of course a risk that some of the data may not be accurate or even misleading due to different approaches to statistical data in all of these four countries. These are things I have to accept and act in goodwill that all the numbers are correct.

Theoretical block

1. Financial crisis

This chapter is dedicated to the theory of financial crises. I sum up in an orderly and detailed manner all the material which is relevant and necessary so it functions as a base for the Analytical block of my MT.

At first I want to talk about the definition of a financial crisis. Basically there are two ways in which it is possible to look at the topic of financial crisis. The first approach, which is also the older and traditional one does not see the origins of economic problems in real economy but instead in financial system. The term *financial crisis* is a broad term under which economists understand three specific cases of malfunction in a financial system.

- Currency crisis
- Banking crisis
- Debt crisis

There is also one newer type of crisis which is called a systemic financial crisis. This type of crisis combines all elements of the three above mentioned crises. And because the current financial crisis is by some people called a systemic financial[3] crisis I will dedicate one chapter to this topic.

1.1. Currency crisis

A currency crisis is a situation where the value of a currency fluctuates dramatically and unexpectedly. This type of a crisis is usually accompanied by speculative attacks which deplete the amount of foreign exchange reserves held by monetary authorities. A direct result of these attacks is a dramatic devaluation/revaluation or depreciation/appreciation of currency. Another result in case of countries which utilize a fixed exchange rate regime is the abandonment of this policy and a shift to free floating.[4]

[3] STRAUSS-KAHN, Dominique. A systemic crisis demands systemic solutions. *Financial Times* [online]. September 23, 2008 , 0, [cit. 2010-08-26]. Dostupný z WWW: <http://blogs.ft.com/economistsforum/2008/09/a-systemic-crisis-demands-systemic-solutions/>

[4] FOURCANS, André,FRANCK ,Raphaël. *Currency crises: a theoretical and empirical perspective*, Edward Elgar Publishing Limited, 2003, p. 8

The problem with a currency crisis is that it can be very disruptive and destructive especially to smaller and open economies. On the other hand when a currency crisis affects a larger economy than the effects can be as destructive as for the smaller economy.

Economists tried right from the beginning to understand better the workings and especially the causes of currency (or in general financial) crises. The foundation of these theories was laid down by Paul Krugman in 1977. He imagined that working on a theory of currency crises was a subject mainly of historical interest. The speculative attacks that brought down the Bretton Woods system in 1971 and the Smithsonian system in 1973 were for him the motivation to start his work. He thought that the fact that major economies had ended the monetary policy of fixed rates marked the end of currency crises and that they would not reoccur.[5]

1.1.1. First generation crisis models

Paul Krugman presented the model of currency crisis in 1979 but it was not until 1995 that Eichengreen, Rose, and Wyplosz introduced the terminology of "first-generation" and "second-generation" crisis models.

Krugman's model describes causes of a currency crisis in cases where monetary authorities use a pegged exchange rate and the country gradually looses foreign exchange reserves. This model is also called a *Model of Balance-of-payment Crisis* because traders (or speculators) acquire large amounts of central bank's foreign exchange reserves.

There are several causes of a currency crisis. The first is a wrong fiscal policy of chronic deficits. The second is wrong monetary policy of pegged exchange rate. And the third cause is monetizing deficits. In a regime of fixed exchange rate this combination of wrong policies leads as mentioned above to a decrease of foreign exchange reserves. Another consequence is usually the inflation.[6]

In this environment foreign investors start to speculate on unsustainability of the fixed exchange rate. The speculation of foreign investors who anticipate abandonment of fixed exchange rate and sharp devaluation (which in effect means lower yields from domestic assets) becomes very intensive. Monetary authorities (usually central bank) bank defends the fixed exchange rate by direct interventions. This decreases the amount of foreign exchange reserves of central bank. At this point central bank has some but not a lot of the remaining foreign exchange reserves. In the end the monetary authorities are forced

[5] KRUGMAN, *Paul. CRISES: THE NEXT GENERATION?*, Princeton University, 2001, p. 1
[6] KRUGMAN, Paul. *A Model of Balance-of-Payments Crises*, Journal of Money, Credit and Banking, Vol. 11, No. 3 (Aug., 1979), pp. 311-325

to abandon the fixed exchange rate regime and change the monetary policy to a free floating exchange rate regime. This leads to a panic among both foreign and local investors and a currency crisis occurs.

Through his model Krugman assumed that the currency crisis is predictable because it is possible to predict speculative attacks on the currency. The problem is that Krugman's model can only predict crises in economies with wrong macroeconomic policies. It cannot predict crises in countries with fundamentally strong economy where macroeconomic policies are more or less set up correctly.

This fact came to spotlight during a currency crisis of European monetary system (1992 to 1993) and was one of the reasons for the beginning of a revision of first generation crisis models and constructinon of second generation crisis models.

1.1.2. Second generation crisis models

At first I want to say that second generation crisis models cannot predict financial crises at all. These models do not suggest that any certain macroeconomic problem or policy can signalize a start of a financial crisis. Second generation of crisis model suggests that a financial crisis can be triggered by a random trigger.

In the work of Maurice Obsfelt he demonstrates that there do not have to be any unsustainable macroeconomic policies in place and that circumstances taking place in a balance-of-payments crisis may purely be self fulfilling events. *"They reflect not irrational private behavior, but an indeterminacy of equilibrium that may arise when agents expect a speculative attack to cause a sharp change in government macroeconomic policies."* [7] It is necessary to say that these attacks can be purely self-fulfilling believes. This means that there is not a need for worsening of actual macroeconomic fundamentals yet of course there is always a cause for this speculation.

Obsfeld turned the attention to measuring and comparing both the cost and benefits of defending a monetary policy of fixed exchange rate and other policy targets. These other targets can be maintaining a low level of unemployment, stimulation of economic growth, reduction of fiscal burden and for example a sound banking system.[8]

[7] OBSFELD, Maurice. *Rational and Self-fulfilling Balance-of-Payments Crises*, The American Economic Review, Vol. 76, No. 1 (Mar., 1986), p. 72

[8] OBSFELD, Maurice. *Models of Currency Crises with Self-Fulfilling Features*, NBER Working Papers 5285, National Bureau of Economic Research, Inc., 1997

In the second generation models the government's response to the speculative attacks of investors who speculate against the pegged currency is optional. It can either defend the peg from speculative attacks or not. Speculative attacks raise the cost of defending a fixed exchange rate. If expected costs of defending the fixed exchange rate exceed benefits of keeping the fixed exchange rate than the monetary authorities will most likely decide to leave the monetary policy of fixed exchange rate system.

The abandonment of a monetary policy of fixed exchange rate of course has its repercussions if form of a depreciation, inflation and a loss of political credibility. If the government does not abandon the fixed exchange rate then inflation will be unnaturally low. The direct consequence is that output will be below its natural rate. Therefore the monetary authorities pay a high price, in terms of lost output, in order to defend the currency. Depending on the costs and benefits of the government's actions and on investors' expectations there can be more than one equilibrium.[9]

What though led to abandonment of second generation of crisis models were the second Mexican financial crisis (1994-1995) and later the Asian financial crisis (1997). These crises have left many economists thinking that it is not possible to explain these crises with first or second generation of crisis models. And thus a third generation of models came to the light. These models acknowledged that there is a connection between monetary and banking problems.

1.2. Banking crisis

Banking crisis is a situation when in the economy appears a large number of defaults and where companies and financial institution cannot repay or have great problems with repaying their debts. The Moody's rating agency describes a default in this manner[10]:

- *A missed or delayed disbursement of interest and/or principal, including delayed payments made within a grace period;*

- *Bankruptcy, administration, legal receivership, or other legal blocks (perhaps by regulators) to the timely payment of interest and/or principal; or*

- *A distressed exchange occurs where: (i) the issuer offers debt holders a new security or package of securities that amount to a diminished financial obligation (such as preferred or common stock, or debt with a lower coupon or par amount, lower*

[9] OBSFELD, Maurice. *The logic of currency crises*, Cahiers Economiques et Monétaires 43, 1994, p. 189–213.
[10] Moody's. *Corporate Default Risk Service – FAQs,* March 2007

seniority, or longer maturity); or (ii) the exchange had the apparent purpose of helping the borrower avoid default.

A result of problems with repaying the debt the proportion of non-performing loans increases dramatically and all or most of the aggregate banking capital is exhausted. This situation can be accompanied by depressed asset prices on both the stock market and real estate market.[11]

A bank run is in many cases also a part of banking crisis. Depositors demand an immediate withdrawal of their money and banks do not have enough cash to satisfy all depositors. This forces banks to sell assets. This further deteriorates the situation on asset markets. Eventually the bank goes bankrupt and claims of depositors have to be settled by monetary authorities.

"Banking crises are also often preceded by credit booms, with pre-crisis rapid credit growth in about 30 percent of crises. Average annual growth in private credit to GDP prior to the crisis is about 8.3 percent across crisis countries. Credit booms have often been preceded by processes of financial liberalization. Crisis-affected countries often suffer from weak legal institutions, rendering a speedy resolution of distressed assets hard to accomplish. Creditor rights in the selected crisis countries average a score of about 1,8. This value is on a scale of 0 to 4 (4 being the maximum possible score)." [12]

Banking crises are also usually preceded by recessions. When recession comes into economy depositors want to re-assess the risk and since they are not informed about the quality and value of the assets of each individual bank the bad shock may again produce situation similar as in the bank runs. Depositors withdraw large amounts from all banks and this creates unexpected liquidity shocks which may lead to panic.[13]

Initial shock can be external and take a form of an increase in foreign interest rates. If monetary authorities keep the currency pegged this monetary policy will lead eventually to a loss of reserves because foreign investors will borrow local money and invest them abroad. If these actions are not sterilized this may lead to a credit crunch which may then lead to increase in bankruptcies and a financial crisis. Moreover if devaluation occurs the position of domestic banks may deteriorate even further because large portions of their liabilities are denominated in foreign currency.

[11] LAEVEN, Luc. VALENCIA, Fabian. *Systemic Banking Crises: A New Database*, IMF Working Paper, 2008, p. 5
[12] LAEVEN, Luc. VALENCIA, Fabian. *Systemic Banking Crises: A New Database*, IMF Working Paper, 2008, p. 19
[13] KAMINSKY, Graciela L. *Currency and Banking Crises: The Early Warnings of Distress*, George Washington University, 2000, p. 5

This all means that macroeconomic condition of domestic economy does matter before the crisis starts. The initial situation and conditions will shape the response of monetary authorities. If macroeconomic conditions are not good monetary authorities have limited amount of possibilities what to do.

Banking crises are dangerous because the fiscal costs are significant especially when crisis lasts for an extended period of time. And even though the measurement of these costs has to involve a certain level of expert judgment there is a positive relation between the length of a crisis and its costs.[14]

1.3. Twin crisis

A twin crisis is when both monetary and banking crisis occur in the "same time". Laeven and Valencia measured all banking and currency crises in period from 1970 to 2007 (see Figure 1) and also defined a twin crisis. They define twin crisis "*as a banking crisis in year t, combined with a currency crisis during the period [t-1, t+1]*" [15]

Banking crises were predominant in the 90's with a peak of 13 banking crises. Currency crises on the other hand had their peak in 1981 where there were 45 currency crises. In total there were 124 banking crises and 208 currency crises.

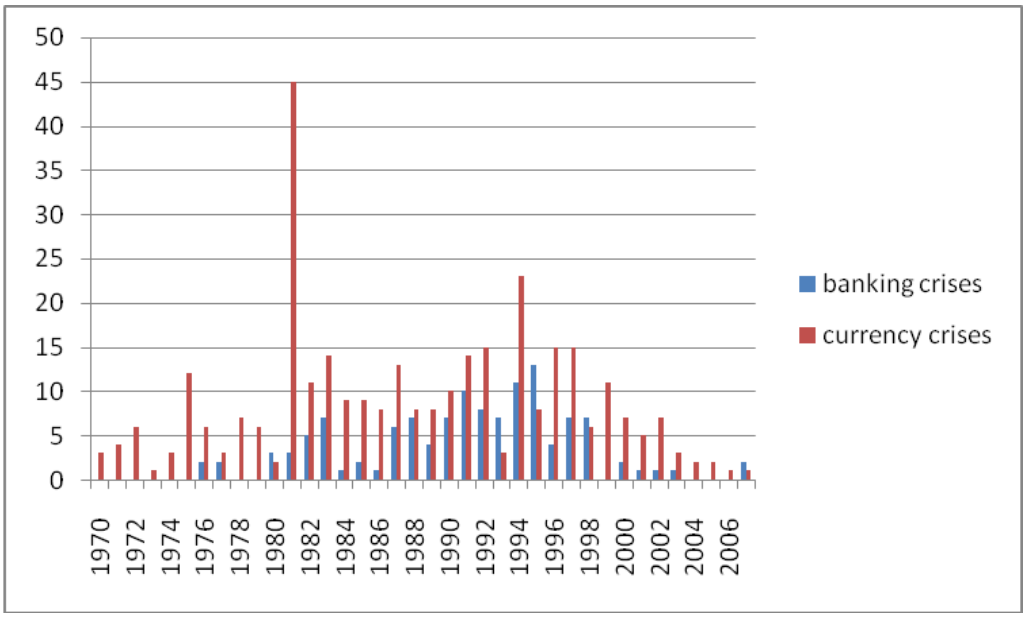


Figure 1. Frequency of banking and currency crises in period 1970-2007

[14] FRYDL, Edward J. *The Length and the Cost of Banking Crises*, IMF Working paper, 1999, p. 26
[15] LAEVEN, Luc. VALENCIA, Fabian. Systemic Banking Crises: A New Database, IMF Working Paper, 2008, p. 6

Source: LAEVEN, Luc. VALENCIA, Fabian. Systemic Banking Crises: A New Database, IMF Working Paper, 2008, p. 56

Of these 124 banking crises 42 (see Figure 2) are considered as twin crises (using the definition stated above).

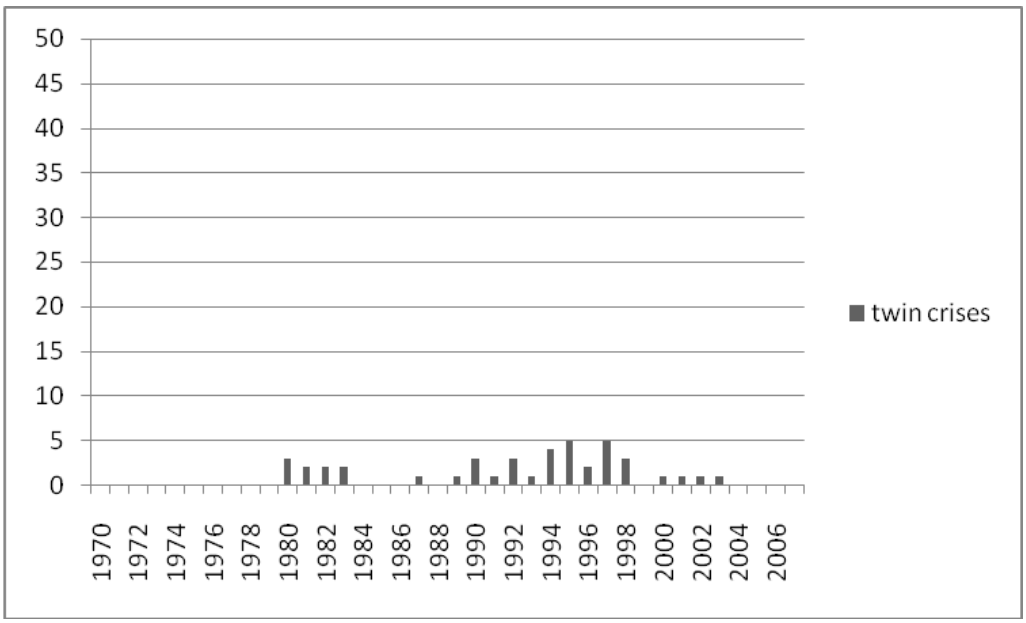


Figure 2. Frequency of twin crises in period 1970-2007

Source: LAEVEN, Luc. VALENCIA, Fabian. Systemic Banking Crises: A New Database, IMF Working Paper, 2008, p. 56

Authors state that in countries with a monetary policy of fixed exchange rates banking crisis and currency depreciation exacerbates the banking sector's problems. This is because of larger foreign credit exposure. According to their study providing assistance to banks and their borrowers can be counterproductive and could result in increased losses to banks which will take additional and unproductive risks on their shoulders but at the expense of government.

„Cross-country analysis to date also shows that accommodative policy measures (such as substantial liquidity support, explicit government guarantee on financial institutions' liabilities and forbearance from prudential regulations) tend to be fiscally costly and that these particular policies do not necessarily accelerate the speed of economic recovery."[16]

[16] LAEVEN, Luc. VALENCIA, Fabian. Systemic Banking Crises: A New Database, IMF Working Paper, 2008, p. 4

Searching for causes of twin crises is a difficult task. The problem lies in causalities. Sometimes a currency crisis can be trigged by a banking crisis. This happens for example when there is an internal debt crisis in the economy. This crisis will damage the credibility of domestic capital market and can cause outflow of capital and in the end a currency crisis.

Sometimes a banking crisis can be triggered by a currency crisis. This can occur if there domestic currency looses a lot of its value against currency in which majority of foreign debt is denominated and which has to be paid by domestic companies to the foreign investors. This harms the financial position of domestic companies and can cause a high number of defaults. This causes problems to banking sector and can trigger a banking crisis.

There is also a possibility that both of these crises are being caused by some other common factor or event.

Kaminsky and Reinhart state in their study[17] that according to their analysis no apparent link was found between balance-of-payments crises and banking crises during the 1970's. This was of course a period of highly regulated financial markets. Kaminsky and Reinhart also found out that external shocks appear to be "at the root of crises".

"*Recessionary conditions usually precede both banking and balance-of-payments crises. These conditions are for example: declining economic activity, weakening of export sector, real interest rates are high and the stock market is sinking. On the monetary side, balance-of-payments crises appear to be preceded by falling foreign exchange reserves, accelerating money growth, and a rapid rise in the liabilities of the banking system not backed by international reserves. Credit expansions predate many of the banking crises; large increases in the money multiplier (usually a product of the liberalization process and reductions in reserve requirements) are evident on the eve of banking crises. External shocks also matter: terms-of-trade declines usually precede both crises; crises are often bunched in a given year or years suggesting the importance of other common shocks, such as international interest rates or contagion effects.*" [18]

And it is this combination of crises which was emphasized by economists during Asian financial crisis in 1997. The combination of currency and banking crises found its way to the surface in third generation crisis models.

[17] KAMINSKY, Graciela. REINHART, Carmen M. *The Twin Crises: The Causes of Banking and Balance-of-Payments Problems*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, 1996
[18] KAMINSKY, Graciela. REINHART, Carmen M. *The Twin Crises: The Causes of Banking and Balance-of-Payments Problems*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, 1996, p. 15

1.3.1. Third generation crisis models

The combination of banking crisis and a currency crisis materialized though theory in the third generation crisis models. And even though economists were still trying to explain financial crises (specifically the Asian financial crisis in 1997) as a currency crisis, the idea that this crisis may be caused by factors both from currency crisis and banking crisis started being more and more explored.

Krugman in his work sees three main variants of the third generation crisis models.[19]

The first variant of third generation of crisis models focuses on the boom and bust cycle of credit and investment. The cycle begins with sharp credit expansion which is caused by a strong inflow of capital into the economy. The most problematic part of course is that this money usually is not invested in sound projects which will generate enough money to repay the principal and the interest. More often this money is used in an unproductive way like current consumption or bad investments.

After a certain period of time banks recognize that significant portion of their loans are nonperforming and that it will be problematic or impossible to get back the money. Often they also recognize that there are not as many good investment opportunities in the country as it seemed to be and naturally they start to raise interest rates to the more adequate level.

This variant was further developed by Corsetti, Pesenti, and Roubini[20] who in their work confirmed that the overinvestment is caused by big inflows of foreign capital in form of credit. They also claim that government guarantees for credit are very harmful because they support the creation of moral hazard. That is because these guarantees support private companies and banks in speculative investments which are of course risky.

After all if fiscal policy is well managed and prudent at the end it may be negated by irresponsible risk taking by private companies and foreign investors purely because of these government guarantees.

According to the model the best way to avoid a crisis is a good and strong regulation of banking sector and low number of government guarantees for the private sector companies.

[19] KRUGMAN, *Paul. CRISES: THE NEXT GENERATION?*, Princeton University, 2001, p. 7
[20] CORSETTI, Giancarlo. PESENTI, Paolo. ROUBINI, Nouriel. *Fundamental Determinants of the Asian Crisis*, University of Chicago Press, 2001

The second variant of third generation of crisis models focuses on the lack of liquidity. This model uses environment of open economy with limited access to international capital. According to Chang and Velasco[21] the Asian financial crisis was not caused by insolvency of private companies and banks but instead it was caused by lack of foreign exchange reserves and by a wrong reaction to this crisis by monetary authorities.

The cornerstone of their work is term "*international illiquidity*" which by their definition is "*a situation in which a financial system's potential short term liabilities in hard currency exceed the amount of hard currency it can have access to on short notice*"[22]

International illiquidity was in their view crucial in triggering a financial crisis. And that is what happened in Asia. Already high and yet fast rising ratios of hard currency liabilities (especially foreign debt) to liquid assets was a troubling sign. These economies where thus more vulnerable to external shocks which was in this case the sudden stop syndrome of gigantic reversal of capital inflows.[23]

Chang and Velasco also believe in their model that there is substantial risk in the behavior of domestic banks in form of low liquidity which they have. This could be also one of the causes for the whole country to become illiquid.

The third and last variant of third generation crisis models focuses on the balance-sheet implications of currency depreciation. According to Krugman[24] the deterioration of balance-sheets of companies played a key role in the Asian crisis. The main factors were the explosion of the domestic currency value of dollar debt and a disappearance of capital of these companies due to declining sales, high interest rates and a depreciated currency.

1.4. Debt crisis

Debt played and is still playing a major role in the current global financial crisis. My personal view is that debt is one of the most powerful tools modern economies have. Its usage is simple. To borrow money in stable and prosperous times is often as simple as going into a grocery and buying a bread and milk. There are unfortunately always countries that

[21] CHANG, Roberto. VELASCO, Andres. Liquidity Crises in Emerging Markets: Theory and Policy, Federal Reserve Bank of Atlanta Working Paper 99-15, 1999

[22] CHANG, Roberto. VELASCO, Andres. Liquidity Crises in Emerging Markets: Theory and Policy, Federal Reserve Bank of Atlanta Working Paper 99-15, 1999, p. 6

[23] CALVO, Guillermo A. *Capital flows and capital-market crises*, University of Maryland – Journal of Applied Economics, Vol. 1, No. 1, 1998,

[24] KRUGMAN, Paul. *BALANCE SHEETS, THE TRANSFER PROBLEM, AND FINANCIAL CRISES*, preliminary draft, prepared for the festschrift volume in honor of Robert Flood, January 1999, p. 10

borrow excessively and usually when the cycle changes from boom to bust these economies are often caught by surprise by a financial crisis.

Debt crisis is described as an incapability of a country to repay its foreign debt or in other words a sovereign default.

There are also other approaches defining a debt crisis. Andrea Pescatori and Amadou N. R. Sy argue that "*defining a debt crisis as a sovereign default overlooks the development of international capital markets and notably the advent of the bond market for emerging market sovereign issuers.*"[25]

These authors specifically point to the fact that in the period after 1994 there was less of full scale sovereign defaults (see figure 3) and yet many countries were faced with intensive debt servicing difficulties. These difficulties should be also called debt crises.

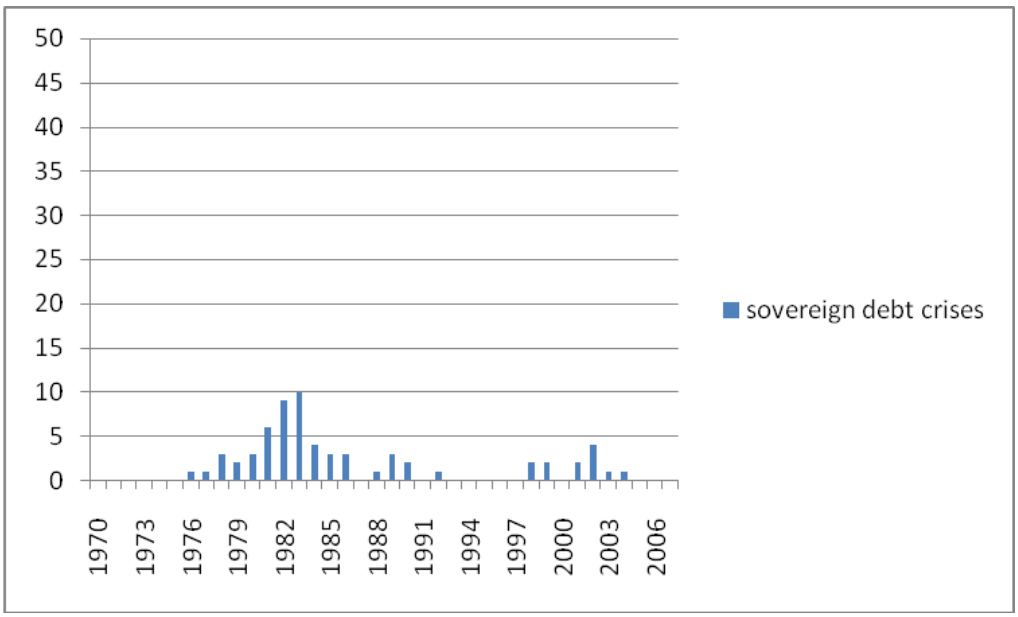


Figure 3. Frequency of sovereign debt crises in period 1970-2007

Source: LAEVEN, Luc. VALENCIA, Fabian. Systemic Banking Crises: A New Database, IMF Working Paper, 2008, p. 56

"More precisely, we define debt crises as events when either there is a sovereign default or secondary market bond spreads are higher than a critical threshold. In practice,

[25] PESCATORI, Andrea. SY, Amadou N. R. *Debt Crises and the Development of International Capital Markets*, IMF working paper, WP/04/44, p. 4, March 2004

market participants often view sovereign bond spreads above the 1,000 basis points (10 percentage points) mark as signaling a significant probability of default."[26]

There are two types of debt crises.

- External debt crisis
- Internal (domestic) debt crisis

1.4.1. External debt crisis

An external debt crisis is a situation where country and/or its private companies or banks are not capable of repaying their foreign debts.

In the period before 1990 it was usual especially for emerging markets to use monetary policy of fixed exchange rate regime and in the same time peg their exchange rate to a strong currency which was in many cases the US dollar. Fixed exchange rate presumably in the short term should help to create a more stable environment for the exporters, importers and of course foreign investors. In the years of solid and stable economic growth and with the currency pegged to the USD the central bank usually maintains high interest rates. All these factors support not only rise in demand for the foreign debt but also influences foreign investors to offer much more capital and credit to the domestic market.

Before the 1990 it was quite usual that problems started when overinvestment or unproductive investment took place in a larger scale. The logical consequence is that the investment does not generate enough cash and the debtor starts to have problems with repaying his debt in time.

The other problem that can happen is purely external. The debtor can invest borrowed money wisely and have abundance of newly created resources from it. Problem is the foreign interest rate from which his debt repayments are calculated. There are plenty of historical examples but the most appropriate one is for me the Latin-American debt crisis which started in 1982 where one of the most powerful trigger was indeed a significant series of interest rate hikes by the United States Federal Reserve.[27]

[26] Andrea Pescatori and Amadou N. R. Sy. *Debt Crises and the Development of International Capital Markets*, IMF working paper, WP/04/44

[27] MILLER, Jessica W. *PennLaw* [online]. 2001 [cit. 2010-09-02*], Solving the Latin American sovereign debt crisis.* Accessible from WWW: <http://www.law.upenn.edu/journals/jil/articles/volume22/issue3/Miller22U.Pa.J.Int%27lEcon.L.677%282001%29.pdf>

This not only decreased the interest rate differential between Latin-American countries and the US but also affected the ability to repay the interest and principal of significant percentage of Latin American loans. The other important thing that happened is also a strong appreciation of US dollar to which majority of counties in Latin-America were pegged.

The interesting thing is that after 1990 problems of servicing the debt burden where joined by a new phenomena of outright defaults. This is quite interesting because in time before crisis the economy actually can still have no major problems with servicing the debt. Problem though is that it has a debt with short maturity. Usually these debts are rolled-over over and over again. This comes to halt when foreign investors cease to buy the debt offered debt and as a consequence all short-term maturities become instantly due. At this moment the debtor can only declare outright default or go for example to the International Monetary Fund and ask for help.

There have been done some studies by IMF which claim that on average countries which have been affected by a sovereign default regain at least partial access to bond and bank transfers from private creditors after about five years.

DAS, PAPAIOANNOU and TREBESCH for example state in their study that "*For the period 1980–2004, sovereign defaults have a strong negative impact on corporate external borrowing, leading to a drop of up to 40%. Crisis resolution patterns play an important role for corporate access to capital. Delays in debt renegotiations caused by government behavior have a negative spillover effect. Deterioration in risk perceptions (higher sovereign bond spreads and lower sovereign ratings) has a strong negative impact on corporate access to capital, in particular, the volume of corporate external borrowing.*"[28]

1.4.2. Internal debt crisis

Internal debt crisis is a situation where domestic companies are overly indebted and start to default on a larger scale. This situation in many cases leads also to a sovereign default. Internal debt crisis also puts a great fiscal pressure on the government of affected country. The reason is that government usually has to transfer big amounts of money to lenders such as bank depositors in order to calm down or even save the system from falling apart. According to Arellano and Kocherlakota an average cost of internal debt crisis is in emerging markets 19,7% of GDP.[29]

[28] DAS, Udaibir S. PAPAIOANNOU, Michael G. TREBESCH, Christoph. *Sovereign Default Risk and Private Sector Access to Capital in Emerging Markets*, IMF Working Paper, WP/10/10, 2010, p. 27
[29] ARELLANO, Cristina. KOCHERLAKOTA, Narayana R. *INTERNAL DEBT CRISES AND SOVEREIGN DEFAULTS*, NATIONAL BUREAU OF ECONOMIC RESEARCH, Working Paper 13794, 2008, p. 9

Internal debt crisis often leaves government no choice but to indeed transfer money to save the system from collapse. What sometimes happens after this is really disturbing because government itself can find itself in trouble of not being able to repay its own foreign debt and defaults as a consequence.

Both sovereign defaults and internal defaults are often associated with significant real exchange rate depreciations. Large internal debt in cases of some countries may though support government to choose higher rates of inflation than what may be considered as usual.

There is one unique study done by Kenneth S. Rogoff from Harward University and Carmen M. Reinhart from University of Maryland who compiled data for the period from 1900 to 2006 which shows a percentage of all countries in default or restructuring.[30] (see figure 4)

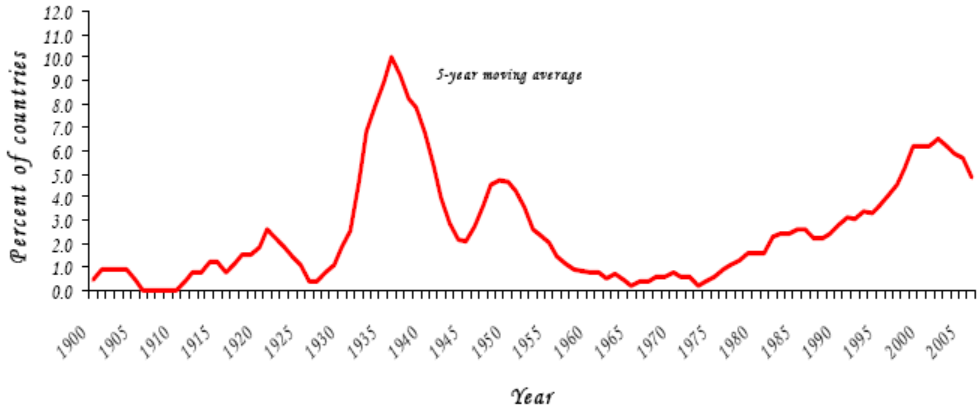


Figure 4. Sovereign Domestic Debt: 1900-2006 (Percentage of all countries in Default or Restructuring

ROGOFF, Kenneth S. REINHART, Carmen M. *The Forgotten History of Domestic Debt*, NBER Working Paper No. 13946, 2008, p. 43

This study shows that there were two periods of higher percentage of all countries were in a state of default or restructuring. Internal debt crises were significant during the Great Depression in 1930's and another rise in number of domestic debt crises started in early 1980's.

[30] ROGOFF, Kenneth S. REINHART, Carmen M. *The Forgotten History of Domestic Debt*, NBER Working Paper No. 13946, 2008, p. 43

1.4.3. Predicting a debt crisis

A very interesting work has been done by the Paolo Manasse, Nouriel Roubini, and Axel Schimmelpfennig. They constructed an early warning model[31] of sovereign debt crises based on these variables:

- Measures of solvency (public or external debt relative to capacity to pay. (such as GDP)
- Liquidity measures (short-term external debt and external debt service in relation to reserves or exports)
- Variables used in models IMF's Early Warning System (GDP growth, current account imbalances, trade openness, monetary mismanagement (in the form of high inflation) and political uncertainty leading to economic uncertainty (years of presidential elections))
- Measures of external volatility and volatility in economic policies.

Their results show that periods of high external debt (more than 49,7% of GDP) and high inflation (larger than 10,5%) present the largest risk of a sovereign default. Their precise calculation says that if these conditions are met (more than 49,7% of GDP and larger than 10,5% inflation) than in approximately 66,8% of all cases a debt crisis will occur. On the other hand countries which have much lower debt to GDP ratios still can face a debt crisis if their short-term debt is above 1,3 times foreign exchange reserves. [32]

1.5. Systemic financial crisis and fourth generation crisis models

The most recent theory started to develop a concept of a crisis which combines some or all of the aspects of isolated currency, banking and debt crises in one so called "systemic crisis". There are several definitions but the best is probably one from the International Monetary Fund which defines a systemic financial crisis like this:

"*Systemic financial crises are potentially severe disruptions of financial markets that, by impairing markets' ability to function effectively, can have large adverse effects on the real economy. A systemic financial crisis may involve a currency crisis, but a currency crisis*

[31] Paolo Manasse, Nouriel Roubini, and Axel Schimmelpfennig. *Predicting Sovereign Debt Crises*, IMF working paper, WP/03/221, November 2003

[32] Paolo Manasse, Nouriel Roubini, and Axel Schimmelpfennig. *Predicting Sovereign Debt Crises*, IMF working paper, WP/03/221, p. 29, November 2003

does not necessarily involve serious disruption of the domestic payments system and thus may not amount to a systemic financial crisis. "[33]

Current theory focuses on causes of systemic financial crises. Economists work with so called "triggers". A trigger is an event which on its own does not necessarily mean any harm. But if a trigger occurs when economy is in "economically vulnerable" state, than they can cause a financial or even systemic financial crisis. Triggers can be internal economic factors (crash on stock exchange, big bankruptcies, political instability …) or external economic factors (foreign currency fluctuations, oil shock …).

A trigger "only" functions as a starting mechanism for the crisis but the development of a crisis is something much more complex. Some authors[34] say that excessive credit expansion and induced debt problem is really decisive for creation of a systemic financial crisis (see Figure 5).

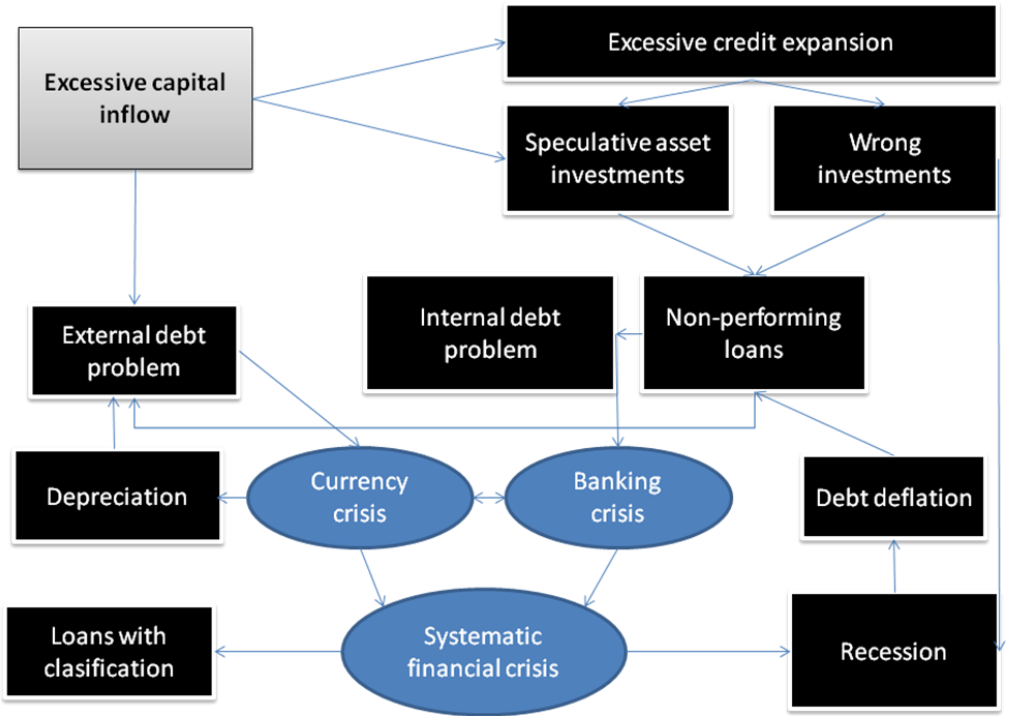


Figure 5. Debt problem as a cause of the systemic financial crisis

DVOŘÁK, Pavel. Veřejné finance, fiskální nerovnováha a finanční krize, 1. vydání, Praha: C.H.Beck, 2008, p. 213

[33] Staff of the International Monetary Fund, *World economic outlook (Financial Crises: Causes and Indicators)*, INTERNATIONAL MONETARY FUND, 1998, p. 75

[34] DVOŘÁK, Pavel. *Veřejné finance, fiskální nerovnováha a finanční krize*, 1. vydání, Praha: C.H.Beck, 2008, p. 213

In the study of the fourth generation crisis models it is typical to look for so called "*channels*" through which the crisis spreads itself. This is a very important part of the theory of these models because a transfer of a financial crisis from one country to another (especially when this second country does not seem to have any significant macroeconomic problems) happens through these "*channels*". It is also called a contagion. A transfer of crisis is possible mainly because the current world is very well interlinked through a network of national financial systems.

Main channels through which a financial crisis spreads itself are[35]:

- Asset market channel
- Banking channel
- Currency channel
- Debt channel

1.6. Foreign exchange reserves and financial crisis

Financial crises occurred in the past and will occur probably again. Some countries though posses in the current financial crisis huge amounts of foreign exchange reserves. And it is only logical to analyze whether these reserves could help these countries to fight the financial crisis or even get out of it with good management of these reserves.

According to IMF the main objectives of holding foreign exchange reserves is to:[36]

- *Support and maintain confidence in the policies for monetary and exchange rate management including the capacity to intervene in support of the national or union currency.*
- *Limit external vulnerability by maintaining foreign currency liquidity to absorb shocks during times of crisis or when access to borrowing is curtailed and in doing so.*
- *Provide a level of confidence to markets that a country can meet its external obligations.*
- *Demonstrate the backing of domestic currency by external assets.*
- *Assist the government in meeting its foreign exchange needs and external debt obligations.*
- *Maintain a reserve for national disasters or emergencies.*

[35] DVOŘÁK, Pavel. *Veřejné finance, fiskální nerovnováha a finanční krize*, 1. vydání, Praha: C.H.Beck, 2008, p. 215

[36] Staff of the IMF, Guidelines for Foreign Exchange Reserve Management, International Monetary Fund, 2004, ISBN 1-58906-260-4, p. 1

The logic behind current trend of large accumulation of foreign exchange reserves in some countries may partly be that after Asian financial crisis some developing countries changed their understanding of how they should protect themselves from a future financial crisis. They knew that a help from IMF is not enough. They also knew that sound macroeconomic policies will not guarantee their protection due to the fact that they can be hit by contagion from another country. And according to Feldstein[37] they decided to self protect them by doing three things.

- *Avoiding High Short-Term Foreign Debt*
- *Accumulating More Foreign Exchange Reserves*
- *Creating a Collateralized Loan Facility*

This should mean that countries with larger levels o liquid foreign reserves should better face the sudden change in flows of capital and financial markets panics. By having these reserves they should not only reduce costs of financial crises but they may even avert these crises from starting.

On the other side Feldstein also emphasizes that hoarding foreign reserves has its social costs. This is because foreign reserves are low-yielding assets (usually U.S. Treasuries). Keeping large reserves means that there is an opportunity cost that equals the cost of external borrowing (or alternatively the social rate of return to investment in that country). The spread between the yield on reserves and the external cost of funds represents the social cost of self-insurance.

1.6.1. Social cost of holding foreign exchange reserves

At first it is necessary to describe what a social rate of return (SRR) is. Definition says that SRR "*reflects the total value of all benefits associated with an investment that accrue to members of society*"[38] therefore:

Social Rate of Return = Private Rate of Return + External Rate of Return

The social rate of return includes not only profits captured by private investors, but also "external" benefits that spill-over onto people who never contributed to the original investment.

[37] FELDSTEIN, *Martin. A Self-Help Guide for Emerging Markers*, Foreign Affairs, March/April 1999
[38] *The Social Rate of Return on Investment*, [online]. [ref. 2010-09-09]. Accessible from WWW: < http://student.ccbcmd.edu/~ryentzer/srr.htm/>

In the last forty years there has been a dramatic rise in accumulation of foreign exchange reserves (see figure 6). The year 1990 was a milestone of the financial globalization and foreign reserves started to balloon up especially since this year. Increase in foreign exchange reserves is visible also in relation to imports (see figure 7).

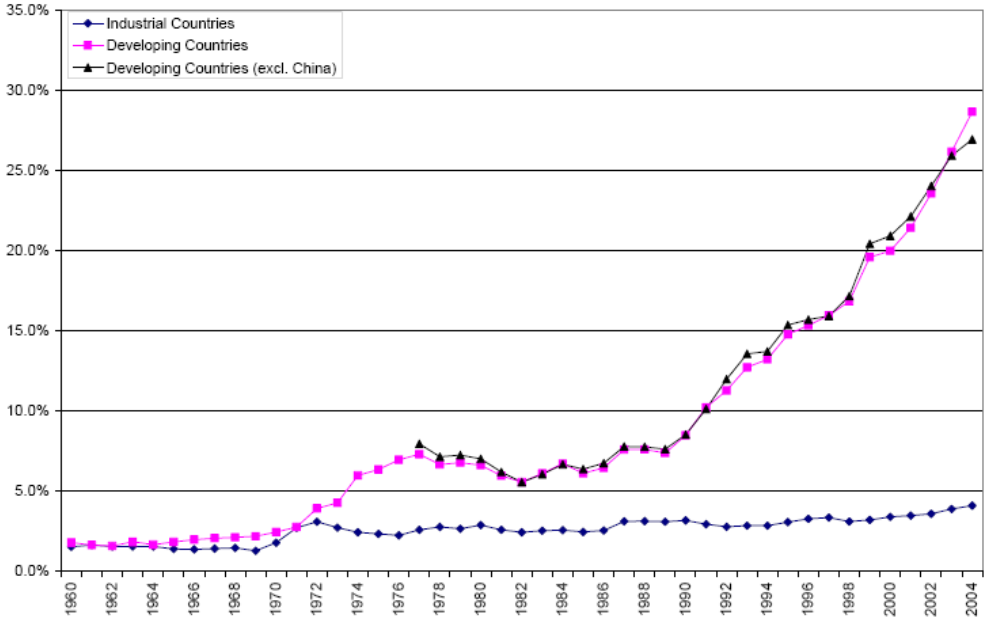


Figure 6. Foreign reserves as a share of GDP (industrial and developing countries)

RODRIK, Dani. *THE SOCIAL COST OF FOREIGN EXCHANGE RESERVES*, NATIONAL BUREAU OF ECONOMIC RESEARCH, Working Paper 11952, January 2006

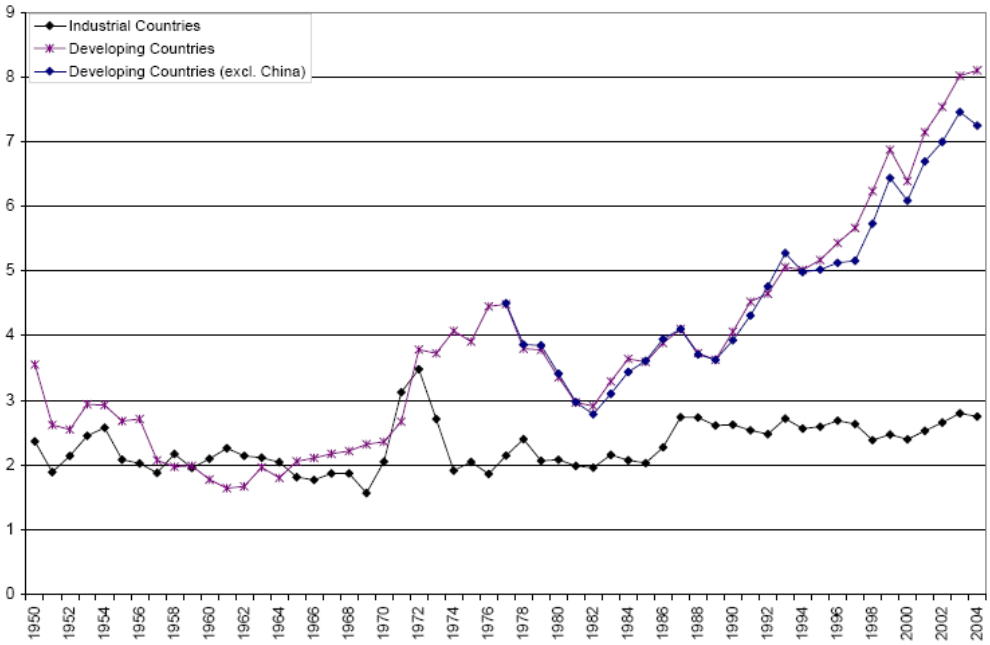


Figure 7. Foreign reserves (excluding gold) in months of imports (industrial and developing countries

RODRIK, Dani. *THE SOCIAL COST OF FOREIGN EXCHANGE RESERVES*, NATIONAL BUREAU OF ECONOMIC RESEARCH, Working Paper 11952, January 2006

Analysis done by Rodrik[39] says that the cost of excess reserves is close to 1 percent of developing countries' GDP which he commented as "*Developing nations are paying a very high price to play by the rules of financial globalization.*" It is therefore important to reconsider the optimal level of foreign exchange reserve accumulation in developing countries.

According to another study prepared by Shin-ichi Fukuda and Yoshifumi Kon "higher *foreign exchange reserves reduce the costs of liquidity risk. An increase in foreign exchange reserves raises both liquid and total debt, while shortening debt maturity. It also leads to a decline in consumption, although investment and economic growth may improve when the tradable sector is capital intensive.* " [40]

2. Monetary policy

The last part of the theoretical block is devoted mainly to monetary policy. The last financial crisis that started in the year 2007 has been marked by unprecedented actions of majority of world's central banks. And because actions of central banks have to be in line with their monetary policy it is necessary to explore the term monetary policy.

In following chapters I will describe both conventional and un-conventional types of monetary policy. I will follow then with my description and talk about the tools of monetary policy which central bank has at its disposal. At the end I will focus on certain types of exchange rate arrangements.

At first I need to say that every central bank has a specific macroeconomic objective or set of objectives which it has to accomplish. These objectives can be for example a certain rate of unemployment, growth of the GDP, rate of inflation, etc. Objectives of monetary policy are usually set up by a law. Central bank uses tools of monetary policy to fulfill these

[39] RODRIK, Dani. *THE SOCIAL COST OF FOREIGN EXCHANGE RESERVES*, NATIONAL BUREAU OF ECONOMIC RESEARCH, Working Paper 11952, January 2006, p. 9

[40] FUKUDA, Shin-ichi. KON, Yoshifumi. *Macroeconomic Impacts of Foreign Exchange Reserve Accumulation: Theory and International Evidence,* ADBI Working Paper 197, Tokyo: Asian Development Bank Institute. 2010, p. 19

objectives but it is very important that actions of a central bank are in line with the monetary policy.

Problem is that central bank usually cannot accomplish these objectives directly. There are actually three levels of objectives[41]. Central bank at first seeks to accomplish "*operative objectives*" which can be for example money market interest rate. Through achieving operative objectives central bank seeks to achieve "*intermediate objectives*" like for example interest rate on the capital market. And through achieving intermediate objective the central bank wants to achieve "*ultimate objectives*" like the rate of inflation.

2.1. The tools of monetary policy

Central bank has a specific set of monetary policy tools through which influences macroeconomic variables. These tools are open market operations, discount loans and changes in reserve requirements. The scheme of the usage of tools of monetary policy and all three levels of objectives illustrates very well all interactions (see figure 8)

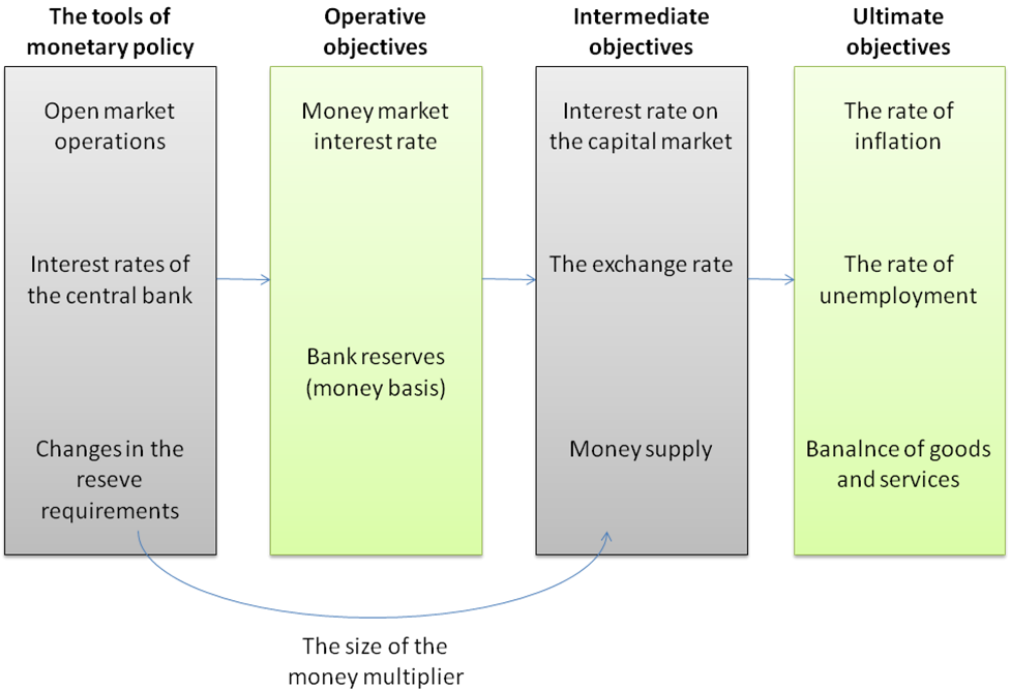


Figure 8. Objectives and tools of a monetary policy

HOLMAN, Robert. *Makroekonomie – středně pokročilý kurz*, 1. vydání, Praha: C.H.Beck, 2004, p. 358

[41] HOLMAN, Robert. *Makroekonomie – středně pokročilý kurz*, 1. vydání, Praha: C.H.Beck, 2004, p. 357

2.1.1. Open market operations

Open market operations are the single most important monetary policy tool at disposal of the central bank. Through these operations central bank influences changes in interest rates and the monetary base.

Open market operations are purchases and sales of government bonds from private banks. Through these open market operations central bank changes the price of bonds. If a central bank purchases bonds from private banks the price of bonds increases and the interest rate decreases. This interest rate represents a money market interest rate. If on the other hand central bank sells government bonds the additional supply will decrease the price of these bonds and a direct consequence is that the interest of these bonds will increase.

Open market operations have a permanent effect also on the amount of reserves which private banks hold. This means that through open market operations central bank can change the monetary base.

If a central bank does not want to affect the monetary base it can use two types of transactions.

- Repurchase agreement (repo) – this transaction obligates the seller of government bonds to repurchase them back at a specified date and at a specified price. This obligation ensures that the change of the monetary base is only temporary.

- Reverse repurchase agreement – this transaction obligates the buyer of government bonds to sell them back at a specified date and at a specified price. An example of this situation is when central bank sells government bonds to a private bank and after a certain period of time the private bank is obligated to sell those government bonds back to the central bank.

Open market operations have clear advantages. They can be implemented quickly. They can be easily reversed through repo and reverse repo transaction. The quantity of these operations can be both small and big because the bond market is usually both huge and liquid. The last advantage is that open market operations are under direct control of the central bank.

A graphical way to describe open market operations can be seen at figure 9.

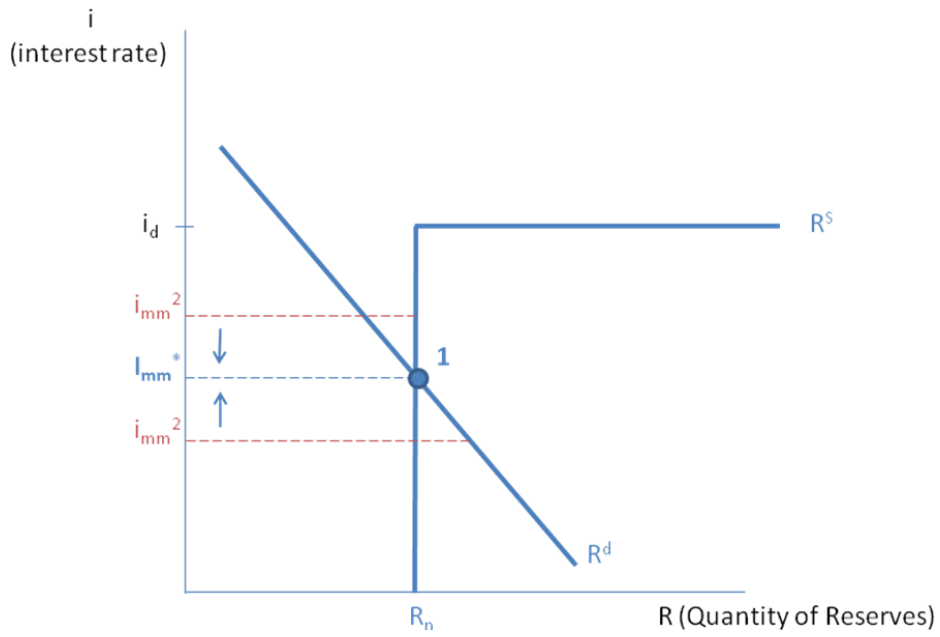


Figure 9. Equilibrium in the Market for Reserves

MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 394

To understand this graphical interpretation it is of course necessary to understand the meaning of the curves first.

The supply and demand curves are derived for reserves. The point at which the quantity of reserves demanded equals the quantity of reserves supplied is the market equilibrium and it represents the money market interest rate ($\mathbf{i_{mm}}$).

The quantity of reserves demanded changes with any change of the money market interest rate. Reserves consist of a certain amount which is required by a law and a certain amount which private bank holds in excess. And so as money market rate decreases the opportunity cost of holding excess reserves falls. All other things being equal, including the quantity of required reserves, the quantity of reserves demanded rises. Consequently, the demand curve for reserves ($\mathbf{R^d}$) slopes downward.

The supply of reserves ($\mathbf{R^s}$) on the other hand consists also of two parts. The first amount of reserves is supplied by the central bank's open market operations. These reserves are called non-borrowed reserves ($\mathbf{R_n}$). The other part of supplied reserves is those which central bank lends to private bank through discount window. These are called discount loans (**DL**). The primary cost of borrowing from the central bank is the discount rate ($\mathbf{i_d}$).

If the $\mathbf{i_d}$ is higher that the $\mathbf{i_{mm}}$ than private bank will not borrow from the central bank and instead it will borrow at the market. If on the other hand central bank decreases the $\mathbf{i_d}$ bellow the $\mathbf{i_{mm}}$ all the private banks would want to borrow at the $\mathbf{i_d}$ and lend at the higher $\mathbf{i_{mm}}$. In this case after short time both these interest rates would equalize. This is also the reason why $\mathbf{i_d}$ is from one point completely flat in other words infinitely elastic.

The graphical interpretation of open market operations has to show both the fact that the central bank purchases/sells government bonds from the private banks (which increases/decreases the amount of non-borrowed reserves $\mathbf{R_n}$) and also the consequent decrease/increase of the money market interest rate $\mathbf{i_{mm}}$ (see figure 10).

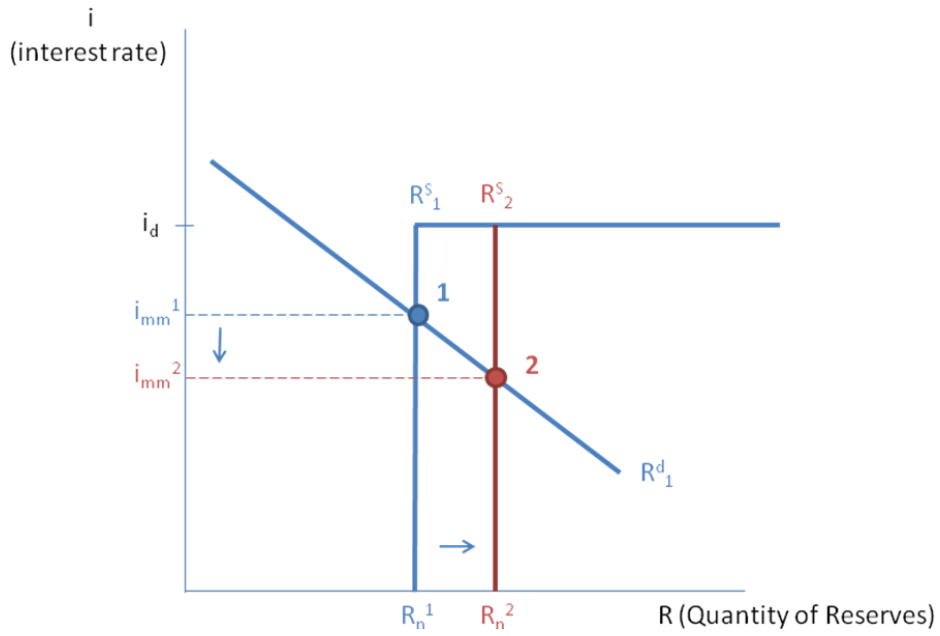


Figure 10. Response to an Open Market Operation (central bank purchases government bonds from private banks)

MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 396

2.1.2. Discount lending

A central bank has an authority to offer to private banks discount loans. These loans are being provided to the private banks for the cost of a discount interest. In other words if a private bank borrows from the central bank it is said that the private bank has used the "*discount window*".

Through setting up the discount rate the central bank can affect the money market interest rate. The money market interest rate will though change only if the discount rate is decreased bellow the actual money market rate. If this decrease is not sufficient and the discount rate still hovers above the actual money market interest rate then there will be no significant effect on the money market interest rate.

If on the other hand the central bank decreases the discount rate ($\mathbf{i_d}$) bellow the money market interest rate ($\mathbf{i_{mm}}$) than all the private banks will want to borrow from the central bank at the discount rate and then lend at a higher interest rate. This forces the money market rate to equalize to the discount rate (see figure 11).

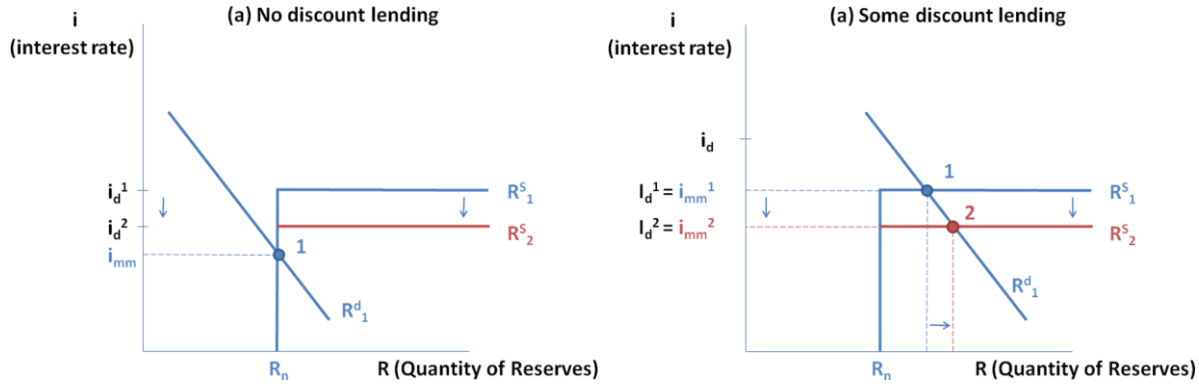


Figure 11. Response to a Change in the Discount Rate (central bank decreases the discount rate)

MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 396

It is necessary to say that central bank usually keeps the discount rate above the money market interest rate. This means that most of the changes in the discount rate have no effect on the money market interest rate.

Discount lending or in other words the possibility to use the discount window is particularly important in times of crisis or financial panics. In a crisis depositors may loose confidence in banks and start to withdraw their money from their bank accounts. This is very dangerous time for any bank or banking sector because banks usually hold just a fraction all the deposits in cash. So when a demand for withdrawing money starts to pick up, the bank is really in a need of larger reserves. In such times the central bank usually acts as a lender of last resort and provides as much liquidity to the banks as necessary. One of the channels through which this liquidity comes to the system is the discount lending.

For example during the current financial crisis "*Since last October (2007), the European Central Bank has provided unlimited funding in euro at fixed interest rates over periods up to six months. This extraordinary expansion of liquidity provided to euro area banks is reflected in the growth of the Eurosystem's balance sheet. Between the end of June 2007 and the end of April 2009, the balance sheet of the Eurosystem increased by about EUR 600 billion, and had reached EUR 1.51 trillion which is equivalent to 16% of the nominal GDP of the euro area. By comparison, the size of the Federal Reserve System balance sheet had reached 14% of the US nominal GDP at the end of April 2009*."[42]

Disadvantage of using discount lending as a tool of monetary policy during non-crisis times is that the central bank cannot control the exact volume of the discount loans. It is unknown to the central bank how many banks will request discount loans at any given interest rate. The problem is also that "*decisions to take out discount loans are made by banks and are therefore not completely controlled by the central bank. This is why the US Federal Reserve moved in January 2003 to the current system in which the discount facility is not used to set the federal funds rate, but is only a backup facility to prevent the federal funds rate from rising too far above its target.*"[43]

2.1.3. Changes in reserve requirements

Central bank sets up a mandatory rate of reserves to customer deposits which commercial banks must to hold on their balance sheets or directly with the central bank. The policy of changing reserve requirements is used very seldom. If though central bank changes the reserve requirements and for example increases required reserves ratio it will cause that commercial banks will seek for additional reserves. This will cause a drop in the money supply which in turn will cause a rise in the interest rates (see figure 12).

[42] PAPADEMOS, Lucas. The cost of the financial crisis: Planning an exit strategy, ECB [online]. 27 May 2009, [ref. 2010-09-06]. Accessible from WWW: <http://www.ecb.int/press/key/date/2009/html/sp090527_1.en.html/>
[43] MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 403

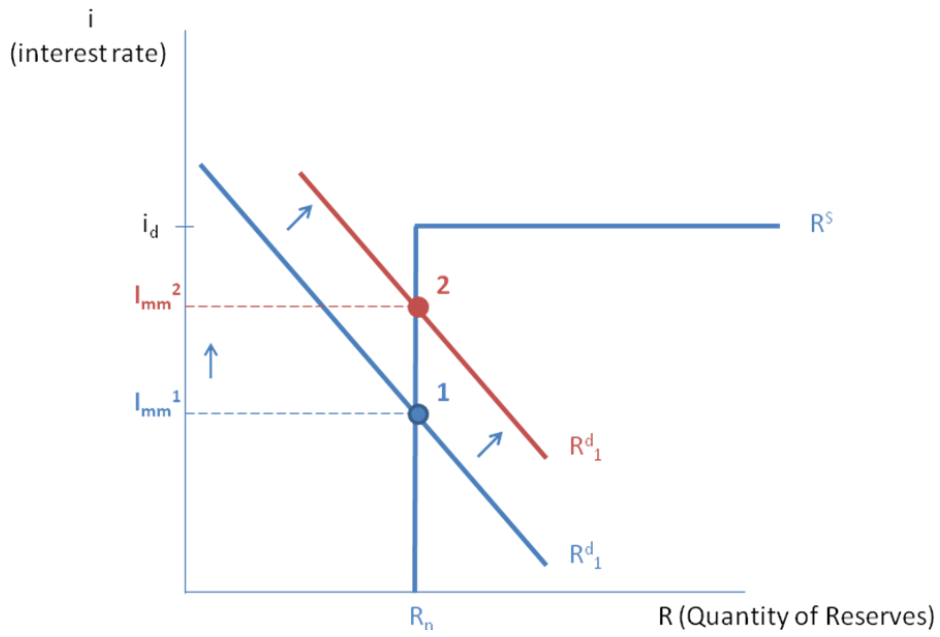


Figure 12. Response to a Change in Required Reserves (central bank increases required reserves ratio)

MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 397

2.2. Exchange rate arrangements

Before I start to talk about the conventional types of monetary policy I must describe some of the most commonly used exchange rate arrangements (or regimes). I will talk only about a selection of exchange rate arrangements – not about all of them. This will help to better understand the framework under which monetary authorities decide which monetary policy to use.

Basically exchange rate arrangements differ through the degree of flexibility and existence of formal or informal commitments to exchange the currency. According to IMF's De Facto classification of exchange rate arrangement[44] there are these categories of exchange rate regimes: *Exchange Arrangements with No Separate Legal Tender, Currency Board Arrangements, Conventional pegged arrangement, Stabilized arrangement Pegged Exchange Rate within Horizontal Bands, Crawling Pegs, Crawl-like arrangement, Floating, Free floating. Also 6,38% of countries in this De Facto classification does not qualify into none*

[44] HABERMEIER Karl, KOKENYNE Annamaria, VEYRUNE Romain, ANDERSON Harald, *Revised System for the Classification of Exchange Rate Arrangements*, IMF Working Paper, Monetary and Capital Markets Department, IMF, WP/09/211, November 17, 2009, p. 4

of the previous mentioned groups and is thus put into a category of "Other managed arrangements (residual)".

IMF occasionally specifies the classification of exchange rate system. One of the important changes took place in 2009. One of the changes has been replacement of managed and independently floating arrangements with two new categories: floating and free floating. The other change has been for example drawing a distinction between formal fixed and crawling pegs, and arrangements that are merely peg-like or crawl-like (See figure 13).

	1998 de facto system		2009 de facto system	
Hard pegs		**23**		**23**
	Arrangement with no separate legal tender	10	Exchange arrangement with no separate legal tender	10
	Currency board arrangement	13	Currency board arrangement	13
Soft pegs		**81**		**78**
	Conventional fixed peg	68	Conventional pegged arrangement	45
			Stabilized arrangement	22
of which: Intermediate pegs		**13**		**11**
	Pegged exchange rate within horizontal bands	3	Pegged exchange rate within horizontal bands	3
	Crawling peg	8	Crawling peg	5
	Crawling band	2	Crawl-like arrangement	3
Floating arrangements		**84**		**75**
	Managed floating	44	Floating	39
	Independently floating	40	Free floating	36
Other managed arrangements (residual)		**n.a.**		**12**
Total		**188**		**188**

Figure 13. De Facto Exchange Rate Arrangements

Source: HABERMEIER Karl, KOKENYNE Annamaria, VEYRUNE Romain, ANDERSON Harald, *Revised System for the Classification of Exchange Rate Arrangements*, IMF Working Paper, Monetary and Capital Markets Department, IMF, WP/09/211, November 17, 2009, p. 4

2.2.1. Exchange Arrangements with No Separate Legal Tender

This arrangement legally enables circulation of currency of a different country in domestic economy. This policy was formally called "*dollarization*". It is when monetary authorities decide to use another currency in the circulation they as a consequence completely surrender their control over domestic monetary policy.

2.2.2. Currency Board Arrangements

Currency board is a monetary arrangement in which monetary authorities back the domestic currency 100% by a foreign currency. In combination with this the monetary authorities declare an irrevocable fixed exchange rate to this foreign currency for which it will exchange the domestic currency.

By adopting a currency board monetary authorities give up the control of monetary policy. Due to especially strong commitment to the fixed exchange rate it is impossible for monetary authorities to change interest rates or print money. This has its negative aspects because for example speculative attacks on the currency board will lead to a sharp decrease in the domestic money supply and further damage to the economy.

2.2.3. Other Conventional Fixed Peg Arrangements

In this kind of exchange rate arrangement monetary authorities pegs the national currency to another currency. They peg the exchange rate at a fixed rate to another currency or a currency basket. In contract to the currency board the exchange rate is not irrevocable and can narrowly fluctuate. Usually monetary authorities allow a ±1 percent fluctuation around the central rate. They maintain the fixed exchange rate through direct intervention with the foreign currency. Monetary authorities can also utilize indirect interventions through interest rate policy, foreign exchange rate regulation etc. This exchange rate arrangement is thus more flexible than the previous ones.

2.2.4. Pegged Exchange Rates within Horizontal Bands

This exchange rate arrangement allows the exchange rate fluctuate within in advance defined bands. These bands are usually set up 1-2 percent from the central rate. The monetary policy is limited by the width of the bands. An example of this arrangement is the European Exchange Rate Mechanism II.

2.2.5. Crawling Pegs

The center point of this monetary arrangement is a periodically adjusted value of the fixed exchange rate. These changes are done on basis of for example the inflation differential between the domestic currency and currency to which the domestic currency is pegged. The rate of crawl is set up by the monetary authorities. On the other hand this

exchange rate arrangement is a limiting factor for the monetary policy. It limits the monetary policy in a similar manner as the system of fixed peg.[45]

2.2.6. Exchange Rates within Crawling Bands

This exchange rate arrangement is a combination of crawling peg system and a system of within horizontal bands pegged exchange rates. The currency is allowed to fluctuate within bands around the central rate. The central rate is usually periodically adjusted and so are the bands.

2.2.7. Managed Floating with No Predetermined Path for the Exchange Rate

This category and also the *Independently Floating* category has been replaced in 2009 by IMF with two new categories (Floating, Free Floating). Regardless of this fact I have to state that this exchange rate arrangement has been quite interesting. Monetary authorities did not define a specific exchange rate target. They also did not define any bands which the value of exchange rate must not cross. Monetary authorities though influenced the exchange rate through direct or indirect interventions. A management of the currency value (specifically the generation of signals for interventions) has been done by analysis of key macroeconomic variables and indicators (e.g. international reserves, balance-of-payments, etc.)

2.2.8. Independently Floating

This exchange rate agreement was purely determined by market forces. Central bank fully utilized the tools of monetary policy. Monetary authorities could even utilize interventions on the foreign exchange market.

2.3. Conventional types of monetary policy

There are basically three types of conventional monetary policy. I will talk about all of them accordingly to the historical development and usage of these policies. There is though one thing that can be found in all of them. All of monetary policies use one common feature called "*nominal anchor*". Actually the central focus of all monetary policies lies on the nominal anchor.

[45] DURČÁKOVÁ, J. -- MANDEL, M. Mezinárodní finance. Praha: Management Press, 2007. ISBN 978-80-7261-170-6, p. 381

2.3.1. Nominal anchor

Nominal anchor is used by monetary authorities as an anchor to which certain economic variables are being tied to. These can be for example exchange rate, money supply or inflation rate. The purpose of a nominal anchor is to function as an intermediate objective to achieve the ultimate objective of monetary policy such as price stability. It is though often said that stabilization programs that use for example exchange rate as a main nominal anchor are often associated with a business cycle that begins with a boom and ends with a recession.[46]

A very important thing for monetary authorities is to conduct monetary policy so that the anchor variable such as the money supply stays in a narrow range. This is because dramatic changes do not signal that monetary authorities are in control of the economic variables. A stable growth or decline of economic variables is much more preferable.

"*One reason a nominal anchor is necessary for monetary policy is that it can help promote price stability, which most countries now view as the most important goal for monetary policy. A nominal anchor promotes price stability by tying inflation expectations to low levels directly through its constraint on the value of domestic money.*"[47]

2.3.2. Exchange rate targeting

Targeting exchange rate was and still is one of quite popular monetary policies especially in emerging markets. In times of gold standard monetary authorities fixed the exchange rate to the price of gold. Nowadays the purpose of targeting exchange rate is to fix the value of domestic currency to currency of another country (called the "*anchor* country") or union which preferably has a low inflation and responsible long-term monetary policy.

There are a number of advantages of this policy. One of them is the fact that by targeting the exchange rate to the anchor country monetary authorities can through this policy keep the inflation rate under control. This is because the anchor country is usually a low-inflation economy. And as the price of internationally tradable goods is set up by the world market the price of such a good cannot differ at a domestic market.

It is quite logical though to ask ourselves a question whether the pegging of the exchange rate really causes a lower inflation or if it is the other way round (meaning that

[46] GOULD, David M. *Does the Choice of Nominal Anchor Matter?*, Federal Reserve Bank of Dallas, 1999, p. 1
[47] MISHKIN, Frederic S. *Monetary policy strategy*, Massachusetts Institute of Technology , 2007, p. 227

countries with low inflation are better suited and able to maintain a pegged exchange rate regime). A quite extensive study has been done by the IMF and their findings say that "*countries with low inflation do indeed have a greater proclivity toward pegged exchange rates. But they* (the findings) *also show that, even allowing for this, pegged exchange rates lead to lower inflation.*"[48]

If the exchange rate target is recognized and credible the inflation expectations will be affected in the same manner as in the anchor country. This is also one of the reasons why some countries which struggle with high inflation choose to peg their exchange rate to a different and low-inflation country. An empirical study and comparison of several countries has been done by the IMF. Results show that countries which peg their currency and do not adjust the exchange rate frequently enjoy a lower inflation than countries with free floating exchange rate (see figure 14).

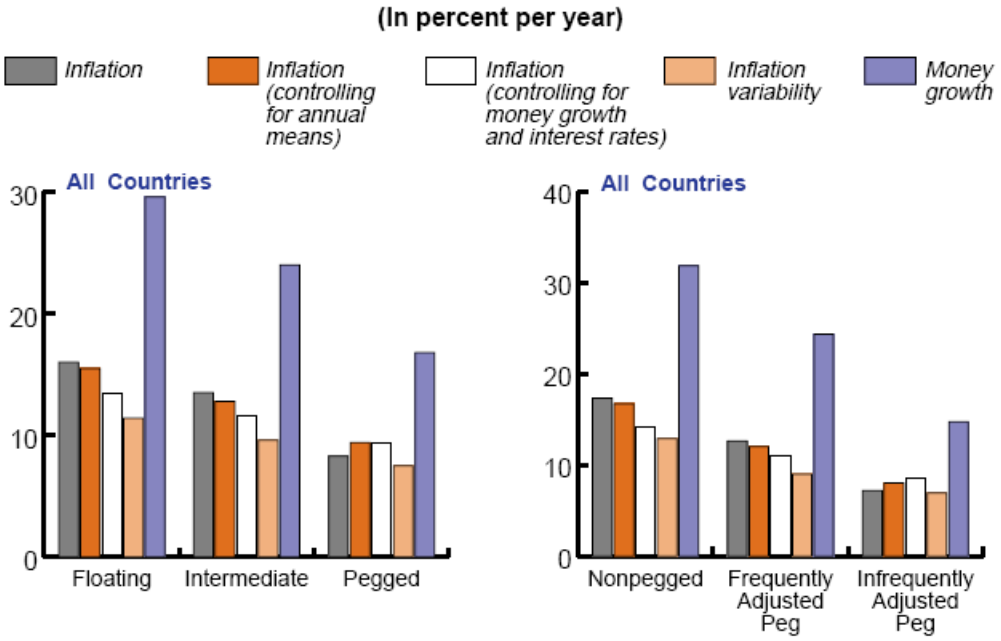


Figure 14. Inflation performance

GHOSH, Atish R. OSTRY, Jonathan D. GULDE, Anne-Marie. WOLF, Holger C. *Does the Exchange Rate Regime Matter for Inflation and Growth?,* International Monetary Fund, 1996, ISBN:1-55775-614-7,p. 5

Other advantage of an exchange rate targeting is the automatically defined reactions of monetary authorities. If the value of exchange rate comes farther away from the central rate than is the maximum distance tolerated by monetary authorities than the central bank

[48] GHOSH, Atish R. OSTRY, Jonathan D. GULDE, Anne-Marie. WOLF, Holger C. *Does the Exchange Rate Regime Matter for Inflation and Growth?,* International Monetary Fund, 1996, ISBN: 1-55775-614-7, p. 7

intervenes. This means that there is a certain respect and expectation toward the actions of monetary authorities.

One of the last advantages is the clarity and simplicity of this policy. Market participants and general public can understand it well.

There are of course also disadvantages of exchange rate targeting. The biggest problem is that the country using the exchange rate targeting no longer has its own independent monetary policy. Monetary authorities cannot react through monetary policy tools on domestic shocks. Also shocks from the anchored country transmit through this policy directly to the anchoring country.

Emerging markets in some cases do not have as developed monetary institutions and legislation. They are not able to use appropriate monetary policies and thus the loss of independent monetary policy through an adoption of exchange rate targeting is not that significant. It actually makes sense for such a country to peg its currency to economically strong and stable country. On the other hand there still exists a high risk to the country which is targeting its exchange rate because they leave the country open to speculative attacks which can have serious consequences for their economies.

There are two varieties of exchange rate targeting. The first is "*soft peg*" and the second is "*hard peg*". Soft pegs make the country more vulnerable to speculative attacks. These attacks can lead to a currency crisis. They are costly in industrialized countries but often devastating in emerging markets.

The problem in emerging markets is that these countries usually have majority of their debt denominated in foreign currency and what is even more problematic is that this debt is usually short-term debt. So if a speculative attack succeeds and a dramatic depreciation occurs, most companies and banks start to have a big balance sheet problem. This can in the end lead to a financial crisis.

"*An additional disadvantage of an exchange-rate target is that it can weaken the accountability of policymakers, particularly in emerging market countries. Because exchange-rate targeting fixes the exchange rate, it eliminates an important signal that can help constrain monetary policy from becoming too expansionary. In industrialized countries, particularly in the United States, the bond market provides an important signal about the stance of monetary policy. Overly expansionary monetary policy or strong political pressure to engage in overly expansionary monetary policy produces an inflation scare in which inflation expectations surge, interest rates rise and there is a sharp decline in long-term bond*

prices. Because both central banks and the politicians want to avoid this kind of scenario, overly expansionary, time-consistent monetary policy will be less likely."[49]

2.3.3. Monetary targeting

Adoption of exchange rate targeting is for some countries nearly impossible. They are for example too big and for them there is no meaningful anchoring country. These are for example USA or the European Monetary Union. Monetary targeting though is in these huge countries possible.

Through monetary targeting country focuses on targeting continual and permanent growth rates for specific monetary aggregates. These aggregates are usually M1, M2 or reserve money and they function as a nominal anchor or intermediate target of monetary policy.

Benjamin M. Friedman defined principal criteria for the selection of an intermediate target for monetary policy of monetary targeting as follows:[50]

"*The principal criteria for the selection of an intermediate target for monetary policy are (1) that the target be closely related to the nonfinancial objectives of monetary policy, (2) that it contain information about the future movements of those relevant aspects of the nonfinancial economy, (3) that it be closely connected to the instruments over which the central bank can exert direct control, and (4) that data on it be readily available on a timely basis.*"

There were several reasons to adopt policy of monetary targeting. Mainly it was the acceleration of inflation in the early 1970s and high and volatile interest rates.

Other reason to switch to a policy of monetary targeting was that Milton Friedman and other monetarists described the volatility in money supply as a main cause for instability in the economy. This volatility was caused by the fact that central bank focused only on regulation of movement of interest rates. Friedman thus suggested that the central bank focuses mainly on the money supply. He recommended that central bank follows a rule to constantly increase the money supply by a certain rate.

The beauty of this approach was that the central bank should increase the money supply no matter the movements of neither the money market interest rates nor the

[49] MISHKIN, Frederic S. *The Economics of Money, Banking, and Financial Markets*, 8th Edition, Pearson Addison-Wesley., 2007, p. 491
[50] FRIEDMAN, Benjamin M. *Monetary policy with a credit aggregate target*, Elsevier, Volume 18, 1983, p.28

macroeconomic fluctuations. Monetary targeting forbids monetary authorities to control a development of interest rates. This means that central bank has to leave interest rates to fluctuate accordingly with the fluctuations of GDP (see figure 15).

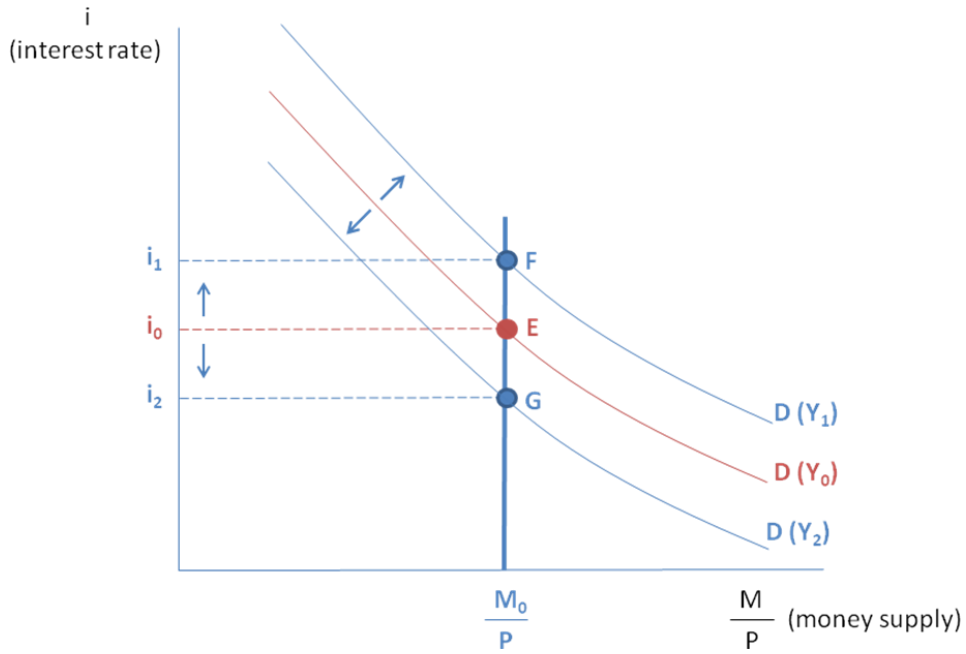


Figure 15. Stabilization of money supply

HOLMAN, Robert. *Makroekonomie – středně pokročilý kurz*, 1. vydání, Praha: C.H.Beck, 2004, p. 377 (HOLMAN, Robert. *Macroeconomics – advanced course*, 1st. release, Prague: C.H.Beck, 2004, p. 377)

Advantages of monetary targeting are that this policy ceases to be activist and on the other hand it becomes more transparent and credible. Monetarists also thought that there will be no more economic fluctuations because in their view these fluctuations were caused by unexpected changes in money supply. In 1979 United States adopted monetary targeting and as a consequence significant changes in the interest rates movement followed (see figure 16).

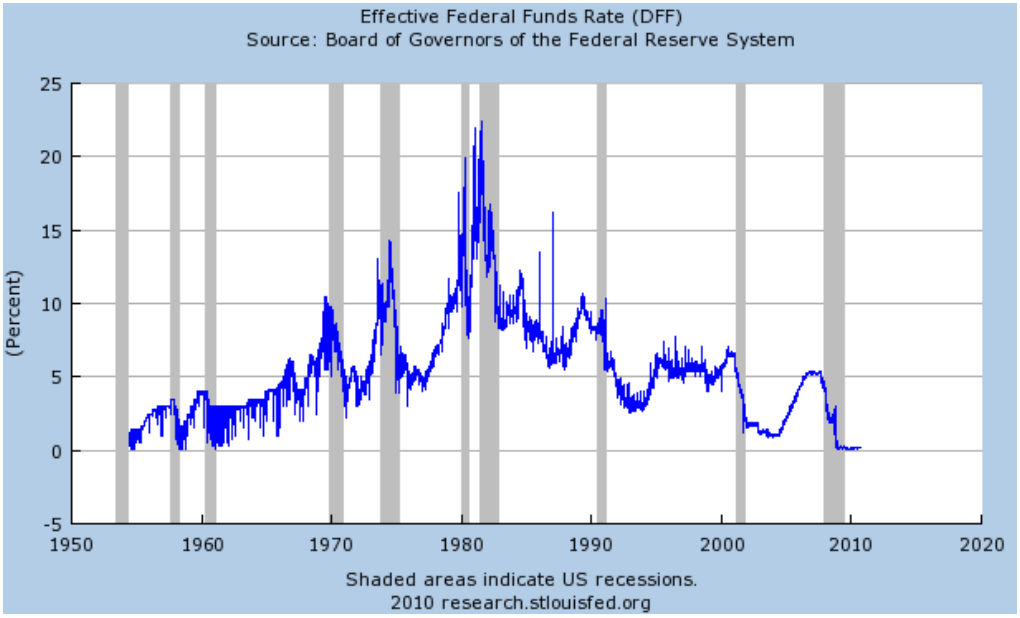


Figure 16. Effective Federal Funds Rate (effective) – July 1954 to December 2010

Board of Governors of the Federal Reserve System, Effective Federal Funds Rate (DFF), Federal Reserve bank Saint Louis, [online] 2010-09-07, [ref. 2010-09-07]. Accessible from WWW: <http://research.stlouisfed.org/fred2/series/DFF/>

History tells us that monetary targeting has been successful only in two countries, namely Germany and Switzerland. Problem is that the relationship between monetary aggregates and ultimate goals of monetary policy was not strong enough in other industrialized countries.[51] In Germany and Switzerland the policy of monetary targeting was different from the original Friedman styled policy. Monetary targeting in these two countries was focused mainly on communication of the strategy of monetary policy. And the ultimate objective of this strategy was to control inflation.

In the 1980s though financial innovation blurred the understanding of what can be counted as money supply and what is just quasi-money. Another problem was that with monetary targeting the central bank cannot accommodate negative external (cost) shocks like increase in the oil prices. As a result of mounting of these objections many central banks adopted inflation targeting instead.

2.3.4. Inflation targeting

[51] ESTRELLA A. MISHKIN F.S. *Is There a Role for Monetary Aggregates in the Conduct of Monetary Policy?*, National Bureau of Economic Research, Inc, November 1996, p. 28

The basis of inflation targeting is a declaration of long-term objective in form of a rate of inflation. Central bank then uses all the monetary tools at its disposal to achieve this objective. Development of monetary theory through targeting exchange rate, than monetary aggregate and at last inflation itself makes a lot of sense because inflation is the only one ultimate objective of monetary policy.

The advantage of inflation targeting is also the fact that its goals are much more understandable for the general public. Based on things that monetary authorities announce (if they are viewed as credible authorities) the public makes rational inflation expectations. It is thus necessary to have a strong institutional commitment to keep price stability the primary goal of monetary authorities. The monetary policy which central bank uses has to be transparent and there have to be regular official communication with banks and the public about the objectives of monetary policy.

Central bank has to be accountable for the success or failure of their actions and decisions.

Empirical evidence tells us about the success of inflation targeting in countries which implemented this policy in times of high inflation. The result of adopting this policy was a reduction in inflation below the levels that they would have attained in the absence of inflation targeting, but not below the levels that have been attained by some industrial countries that have adopted other monetary regimes.[52]

The policy of inflation targeting generally reinforces the position of central bank. There are of course though no easy permanent solutions and even with inflation targeting policy the economy needs to be directed with a good fiscal policy and the financial system also has to be kept in a good shape.

In last two decades the shift toward inflation targeting was quite dramatic. This shift was more evident in industrialized countries than in non-industrial countries. What is interesting though is even bigger shift to managed floats and monetary policies of multiple targets.[53] (see figure 17)

[52] BERNANKE, LAUBACH, T. MISHKIN, F.S. POSEN, A.S. *Inflation Targeting: Lessons from the International Experience*. Princeton University Press, 2001, ISBN 0-691-08689-3

[53] Monetary and Financial Systems Department, Policy and Development Review Department, and Research Department, *Inflation Targeting and the IMF*, INTERNATIONAL MONETARY FUND, March 16, 2006, p. 6

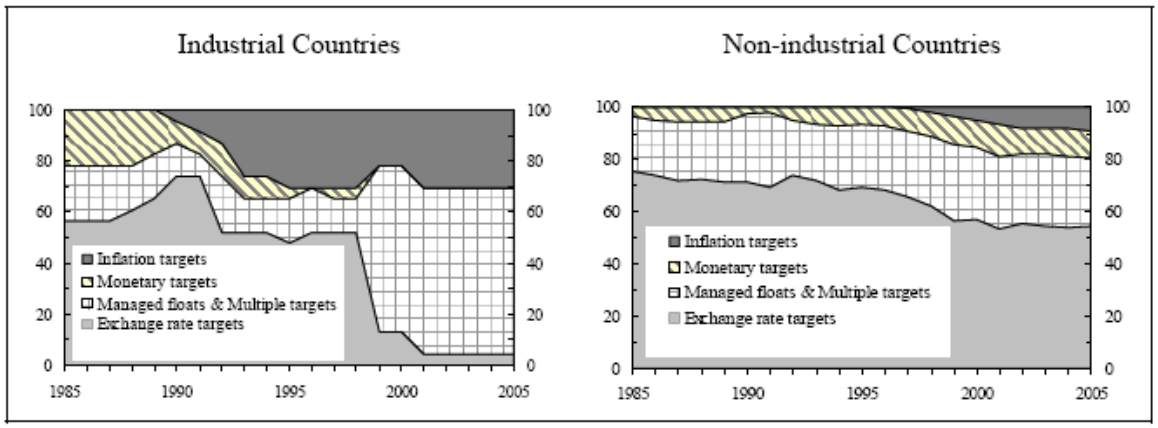


Figure 17. Evolution of Monetary Policy Regimes, 1985-2005

Monetary and Financial Systems Department, Policy and Development Review Department, and Research Department, Inflation Targeting and the IMF, INTERNATIONAL MONETARY FUND, March 16, 2006, p. 6

2.4. Unconventional monetary policy measures

In times of a crisis monetary authorities will more and more start to use unconventional monetary policy tools. Central bakers argue that in abnormal economic conditions like in the current financial crisis the usage of only conventional tools would not achieve the objectives of central bank. [54] There are basically two reasons why.

First is that economic shocks are so powerful that the nominal interest rate needs to be brought down to zero. At that point it is impossible to cut interest rates even lower and additional monetary tools have to be utilized. Unconventional policies focus on bringing more money stimulation in the system and thus improving financing conditions.

The second reason describes situation where interest rates are above zero but the monetary policy transmission process is significantly impaired. In this case central bank has to reduce the short term nominal interest rates even further or it has to act directly on the transmission process.

2.4.1. Direct Quantitative Easing

[54] SMAGHI, Lorenzo Bini. Conventional and unconventional monetary policy, ECB [online] Data as of 28 April 2009, [ref. 2010-09-08], Accessible from WWW: < http://www.ecb.int/press/key/date/2009/html/sp090428.en.html/>

Direct quantitative easing is a monetary policy tool through which central bank expands the size of its balance sheet. It purchases assets directly from public or banks. The logic is that by large purchases of longer-term government bonds yields will decrease. These yields usually function though as a benchmark for pricing riskier private issued securities. And thus when yields on government bonds decrease the yields on private bonds should decrease too. This will then stimulate longer-term investments and aggregate demand.

2.4.2. Direct Credit Easing

Direct credit easing is used in cases of liquidity shortage and wide spreads in certain markets segments. Monetary authorities purchase commercial paper, corporate bonds and asset backed securities. By this they aim at the wholesale financial markets and their importance in the financing of households and firms. Through buying these instruments monetary authorities take on their balance sheet real credit risk and in the same moment influence the monetary base.

2.4.3. Indirect (or Endogenous) Quantitative/Credit Easing

This monetary policy is quite interesting because it enables the central bank to lend to the banks at long maturities and as collateral they take assets for which there is no functioning market at the moment. These assets are usually temporarily impaired.

"*This policy affects directly the yield curve over the horizon at which policy operations are conducted or committed to be conducted. For instance, monetary policy operations with maturity of 6 months directly affect the 6 months interbank money market. This is particularly the case if the operations are conducted at a fixed rate, full allotment.*"[55]

There is one problematic part of this policy and that is the fact that an increase in the monetary base is determined purely by the banks. If central bank purchases assets from their balance sheet it does not yet mean that banks will immediately lend this money to the public or private sector. In stressful market conditions banks will hoard money and the unconventional policy of indirect quantitative/credit easing may not prove as successful.

3. The end of Theoretical bloc

[55] SMAGHI, Lorenzo Bini. Conventional and unconventional monetary policy, ECB [online], Data as of 28 April 2009, [ref. 2010-09-08], Accessible from WWW: < http://www.ecb.int/press/key/date/2009/html/sp090428.en.html/>

A good understanding of theory of financial crises and monetary policies is necessary to better analyze the real world economy. The theory is important to better not only analyze but to better understand not only the financial crisis as itself but also actions of central banks. At the end it is the theory and real economic data which should help find answers and understanding to whether monetary policies of fixed rate regimes may encourage a creation of a financial crisis and whether foreign exchange reserves may help a country to get out of a financial crisis.

These two theses will be tested in the analytical bloc.

Analytical block

4. People's Republic of China (PRC)

China was for centuries a leading civilization in the world[56]. Problems came at the end o 19th century and in the beginning of 20th when China started to fall into civil unrest, famines and also a foreign occupation. Regime changed in 1949 when communist party gained power and with its leader Mao Zedong established a socialist system.

After 1976 new generation of leaders came to power and namely Deng Xiaoping started to focus on market orientated reforms. In the period 1976 to 2000 the Chinese output had quadrupled. Living standards of much of the population have improved significantly yet political controls remained still tight.

4.1. Political system

PRC is a socialistic republic with one ruling Communist Party of China (CPC). State power is exercised through two branches. One is the CPC and the second is the Central People's Government. Both of these entities have their provincial and local counterparts.

The lowest level of PRC's political power the People's Congresses are being elected by voters. These county level People's Congresses elect among others members to the Provincial People's Congress. The Provincial People's Congress in turn elects members to the National People's Congress. National People's Congress is the highest state body and the only legislative house in the PRC. Majority seats in the National People's Congress are being controlled by the Communist Party of China.

Interesting is that there has actually been some attempts toward political liberalization. But these attempts were not significant and the CPC still has full control over the country.

4.2. Economy in general (GDP, unemployment, inflation)

[56] DAHLMAN, Carl J. AUBERT, Jean-Eric, *China and the Knowledge Economy: Seizing the 21st Century*, WBI Development Studies, World Bank Publications, 2008

China's economy is to a larger sense already a market economy with private ownership. In the last twenty years China has accomplished consistent and very strong growth in the Gross domestic product (see figure 18)

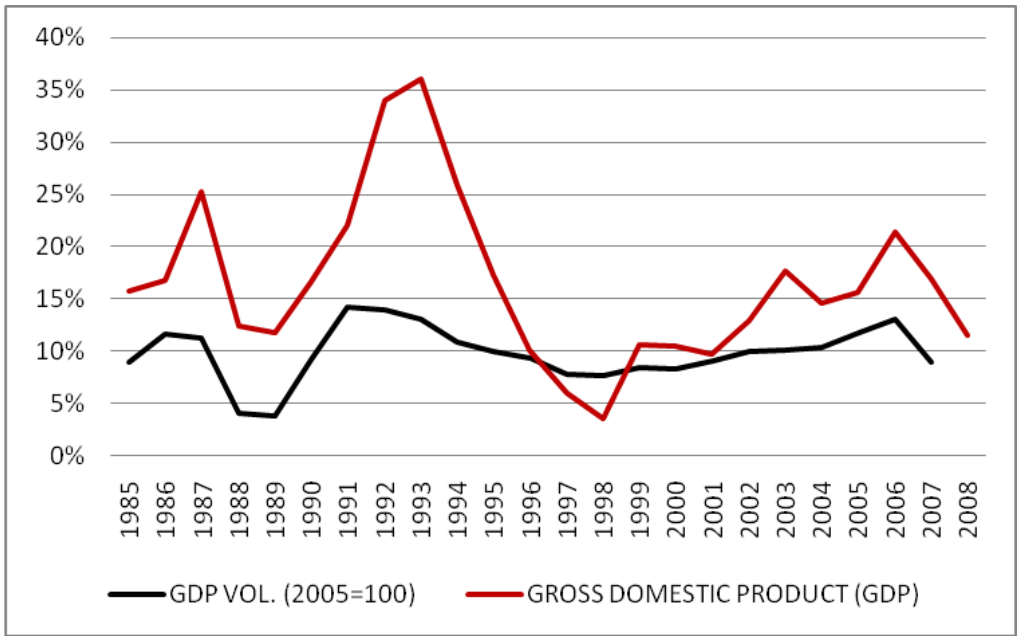


Figure 18. Rates of GDP(China) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

Since the liberalization in 1978 China's economy has grown more than 10 times. Now China is the second biggest economy in the world with nominal GDP at the end of 2009 at 33,535 trillion Yuan. China is the fastest growing major economy in the world and as it is visible from the Figure 18 its GDP in steady prices hovers for the last 25 years around 10%. Even in the time of global financial crisis this data shows that growth has not been suppressed that much.

In the period of 1985 until 1996 China had a very high inflation with two peaks of inflation rates of more than 15% annually (see figure 19). This drop in inflation is a very significant one and shows that China made number of right macroeconomic and monetary decisions which helped to cool the inflation down.

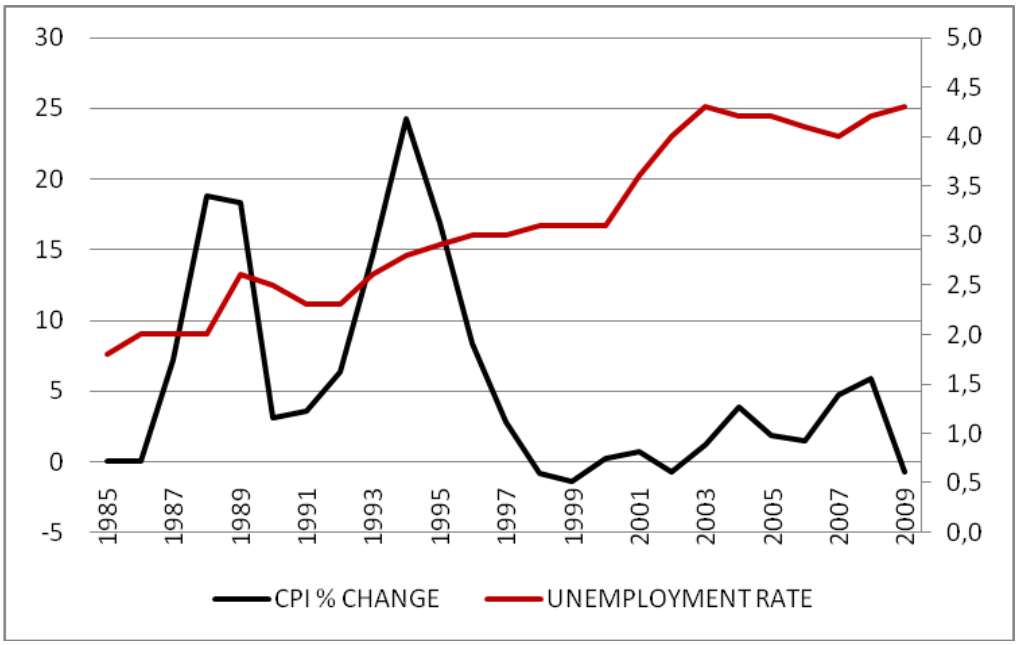


Figure 19. Rates of CPI and unemployment (China) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

The unemployment on the other hand rises steadily from the year 1985 and has been decreasing slightly since 2003 from 4,3% to 4% until the end of 2007. Since the global financial crisis started the unemployment rate again started to rise.

So when I summarize GDP growth, inflation rate and unemployment rate. I can distinctly divide three separate periods. The first one was until 1997 with volatile GDP growth, volatile and high inflation rates and relatively lower unemployment rate. This period was marked by consistent and strong depreciation which was managed by monetary authorities. Since the Year 1997 the GDP growth has stabilized, inflation stabilized and moved permanently bellow 5%. The rise in unemployment was more significant.

The third period is since the end of 2007 when the global financial crisis started. The GDP growth rate decreased dramatically and inflation rate moved in the year 2009 even bellow zero. The unemployment figures were stable and until the end of 2009 the data does not show any dramatic rise.

All of this development has some roots in the monetary policy of China's monetary authorities. The monetary policy of China and decisions which China's monetary authorities made had filled front pages of many economy newspapers from the beginning of this financial crisis.

4.3. Monetary policy (recent and past crises)

Chinese monetary policy is since 1984 formally carried out by the People's Bank of China. People's Bank of China exercises central bank functions and powers by conducting macro-control and supervision over the nation's banking system.

"*The objective of the monetary policy is to maintain the stability of the value of the currency and thereby promote economic growth.*"[57]

"*The monetary policy instruments applied by the People's Bank of China include reserve requirement ratio, central bank base interest rate, rediscounting, central bank lending, open market operation and other policy instruments specified by the State Council*."[58]

4.3.1. Past economic problems and responses of authorities

The period until 1997 was a time of extremely high inflation. Monetary authorities decided in 1995 that their primary target has to be curbing inflation.[59] They adopted a strict policy of controls over the total currency credits. The increase in broad money was 34,5% in the year 1994 but was then controlled by the central bank and went down to 17,3%. The growth of consumer prices started decrease as a consequence (see figure 20a).

Monetary authorities also decided to cease further devaluation of the exchange rate. They stabilized the value of Yuan nearly at the weakest value which Chinese currency (Yuan) reached in 1994 at 8,62 Yuan per USD (see figure 20b). Since this moment the currency stopped to depreciate and the rate of inflation started to sharply decrease.

[57] *Objective of the Monetary Policy*, [online]. [ref. 2010-09-13]. Accessible from WWW: < http://www.pbc.gov.cn/english/detail.asp?col=6630&ID=21/>
[58] *Objective of the Monetary Policy*, [online]. [ref. 2010-09-13]. Accessible from WWW: < http://www.pbc.gov.cn/english/detail.asp?col=6640&ID=22/>
[59] GEN-YOU, Dai, *China's Monetary Policy: Retrospect and Prospect,* Monetary Policy Department of People's Bank of China, 2001

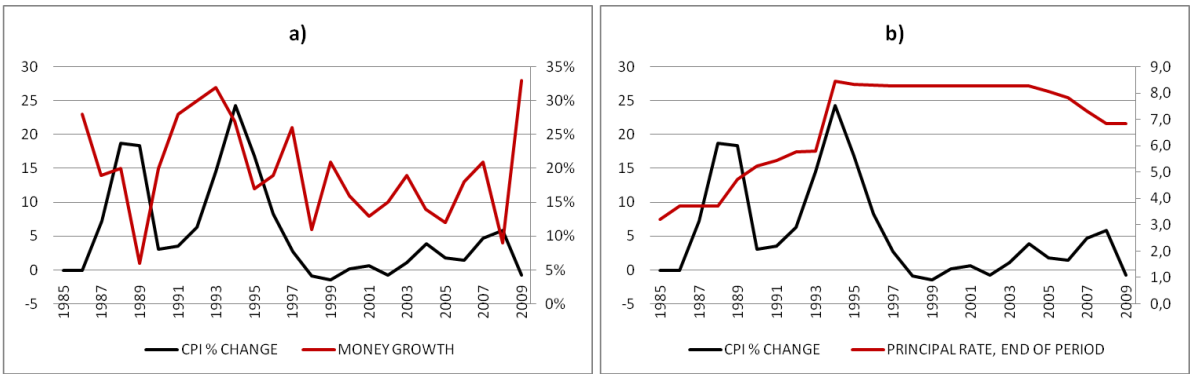


Figure 20a. Rates of CPI and Money Growth (China) 1985-2009
Figure 20b. Rates of CPI and Exchange rate Yuan-USD (China) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

Problems came with Asian financial crisis and with the reversal of flows of capital to the region. Chinese central bank reacted promptly and decided to again increase the money supply through reduction of interest rates for seven times (see figure 22a), downward adjustment of the deposit reserve ratio twice, expansion of the open market operations and expansion of the commercial banks credit. In 1998 and 1999, the broad money supply thus shot up 15.3 percent and 14.7 percent respectively,

4.3.2. Current financial crisis (Balance-of-Payments, FX reserves)

China entered into the process of current global financial crisis in a very good macroeconomic shape. From figures 18-20 it is clear that GDP growth was strongest in more than a decade. At the end of 2007 the rate of GDP growth was 13 percent. Inflation was though also highest in more than a decade. The rate of inflation was 4,7 percent. On the other hand this rate is from longer perspective of 25 years still very low. The unemployment was at 4,75 percent.

One thing that helped softened and also stabilize negative effects of global financial crisis were the foreign exchange reserves which monetary authorities of China accumulated. Due to the current and capital account surpluses which started to balloon up since 2001 (see figure 21a) the amount of foreign exchange reserves has risen to more than 1,5 trillion USD in 2007 (see figure 21b) and by the end of 2009 these reserves nearly reached a level of 2,5 trillion USD.

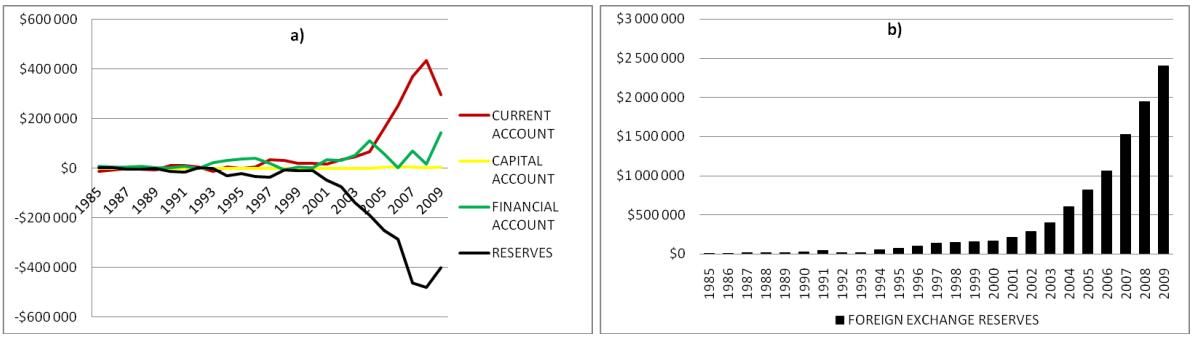


Figure 21a. Current account, capital account, financial account, reserves (China) 1985-2009 (in millions)
Figure 21b. Foreign exchange reserves (China) 1985-2009 (in millions)

Source: IMF Statistics (data compiled by author of the MT)

4.3.3. Current financial crisis (Exchange rate policy, NEER, REER)

The really interesting thing is the development of the value of the exchange rate. Chinese monetary authorities decided in the year 2005 to start gradually revaluate the Yuan (see figure 20b). The reason for this monetary policy decision was according to statement of People's Bank of China to curb inflation and shift investment toward service industries from export-manufacturing.[60]

This policy lasted until the year 2008 when Chinese monetary authorities decided that Chinese currency does not need to be revaluated any more. United States of America had repeatedly argued that the Yuan is under valuated and that this monetary policy unfairly helps Chinese exports and at the expense of everyone else. Now in 2010 Chinese authorities again said that Yuan may be slightly revaluated in the near future.

A very interesting turnaround can be seen on the Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) (see figures 22abcd). Throughout the mid 1980s and early 1990s, the CPI-based real effective exchange rate depreciated drastically. This was a result of big devaluations of the nominal exchange rate (see figure 20b). The value of NEER was much higher than the value of REER in this period.

The REER appreciated continually since 1994 until the start of the Asian crisis in mid-1997. This was a reflection of a faster CPI growth in China than in its partner countries. Since

[60] CHEN, Judy. *Yuan Strengthens Most since 2005 after China Signals End to Peg*, [online], June 21 2005, [ref. 2010-09-14], Accessible from WWW: < http://noir.bloomberg.com/apps/news?pid=newsarchive&sid=ah3_IuOO4vAk/>

1999 China's CPI inflation has been lower relative to partner countries and both REER and NEER depreciated.[61]

Since the year 2005 the situation of higher NEER and lower REER reversed and due to a low CPI inflation in China the NEER was already on the July 2010 6,363 percentage points bellow the REER. The values of NEER and REER (with a base year 2005) were on the July 2010 116,365 and 122,728.

The actions of People's Bank of China during the last financial crisis are also reflected in their interest rate policy. Before the crisis begun the PBC raised several times the lending rate from its lowest level of 5,31% in 2004 to 7,47% in the end of 2007 (see figure 22b). Since the start of the crisis the PBC has slashed down the lending rate dramatically again to 5,31% in just four months.

PBC also managed to dramatically increase the money growth rate to an unprecedented 33% in the Year on Year (YoY) basis in the year 2009 (see figure 20a)

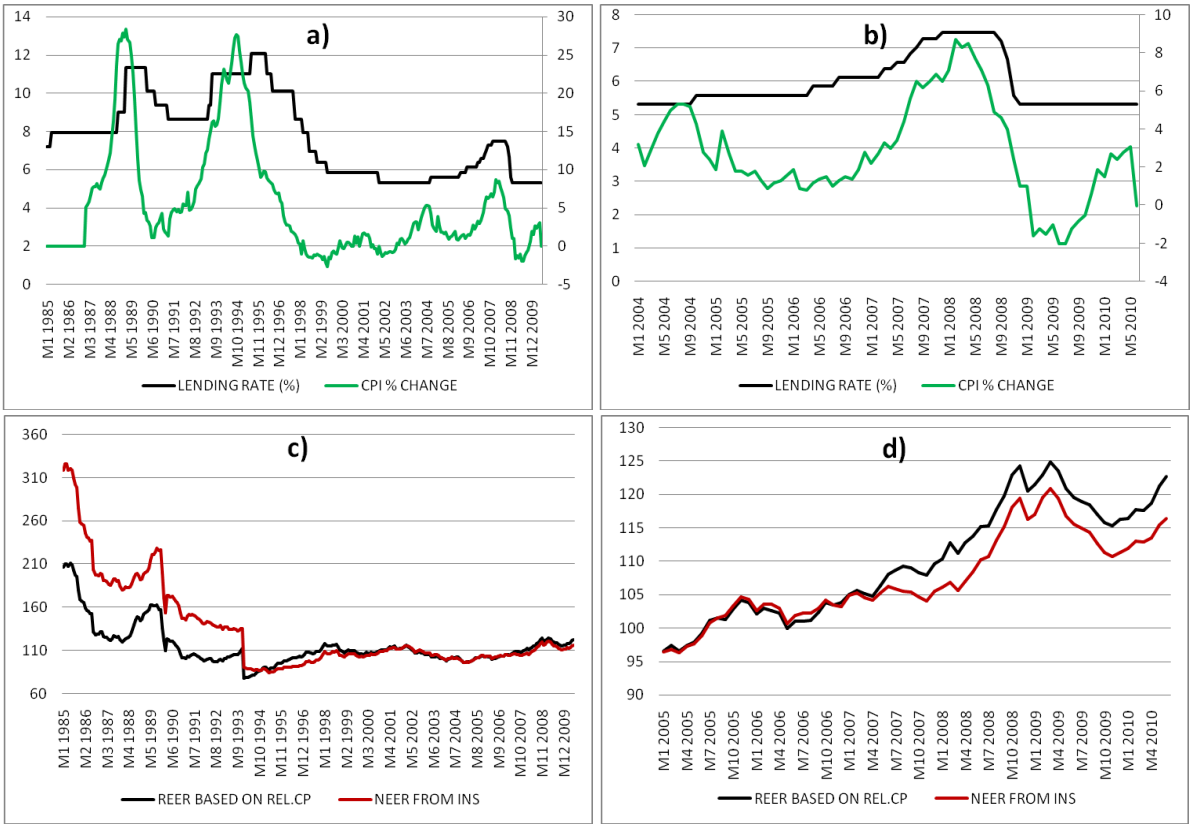


Figure 22a. Lending rate (%), CPI Change (%) (China) 1985-2010

Figure 22b. Lending rate (%), CPI Change (%) (China) 2004-2010

[61] WANG, Tao. *China: Sources of Real Exchange Rate Fluctuations*, International Monetary Fund, IMF Working Paper, Asia and Pacific Department, February 2004, p. 5

Figure 22c. REER, NEER (China) 1985-2010 Index Numbers (2005=100)
Figure 22d. REER, NEER (China) 2004-2010 Index Numbers (2005=100)

Source: IMF Statistics (data compiled by author of the MT)

4.3.4. Review of fixed exchange rate usage in China (first MT hypothesis)[62]

Officially China has a managed floating exchange rate system since 1995. The currency is though in reality fixed to the USD. Chinese monetary authorities kept the value of Yuan from 1996 until the year 2005 completely fixed at an exchange rate of approximately 8,277 Yuan per 1 USD. This policy has been seen as a very good choice in the time when the Asian financial crisis broke out because China was completely avoided by this crisis and did not have to undergo any devaluation (see figure 23)

Since 2005 China started to revaluate slowly its currency to curb inflation and shift investment toward service industries from export-manufacturing. China was also under a strong pressure from United States which claimed that China manipulates its currency and that Yuan is undervalued.

The revaluation lasted until the year 2008 when Chinese monetary authorities decided that Chinese currency does not need to be revaluated any more. Chinese monetary authorities though that the stability of Chinese economy will be strengthened by a stabilization of the value of Yuan to USD. And thus since 2008 the value of Yuan is again fixed.

[62] Monetary policies of fixed rate regimes may encourage a creation of a financial crisis.

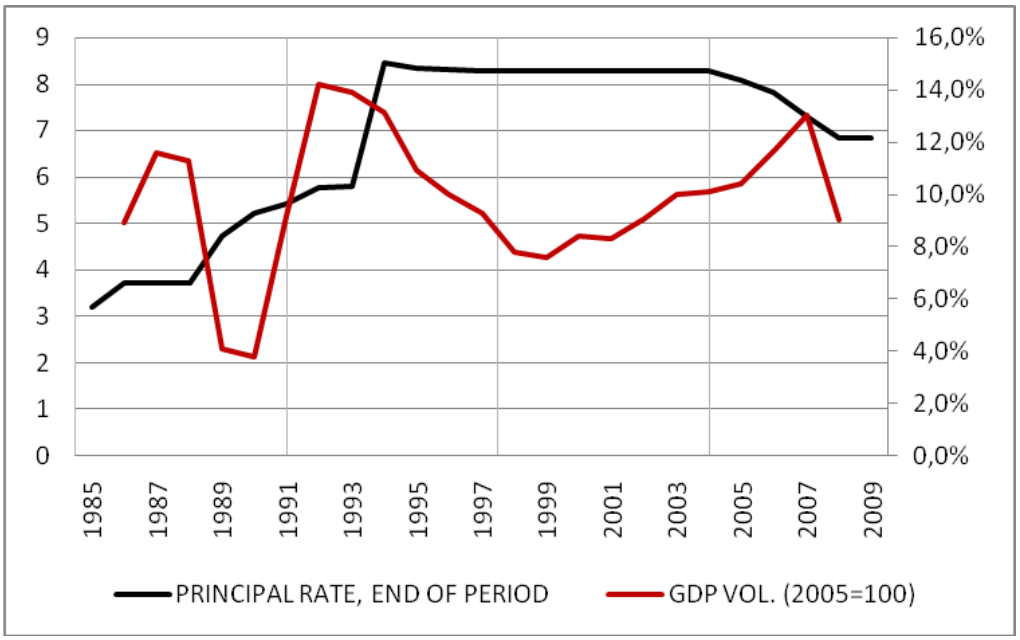


Figure 23. Exchange rate Yuan-USD; GDP growth rate with base 2005 (%) (1985-2010)

Source: IMF Statistics (data compiled by author of the MT)

In both crisis (Asian financial crisis and the current global financial crisis) the monetary policy of a fixed exchange rate regime seems to be one of the factors which stabilizes China's macroeconomic position and helps to prevent a crisis to spread into the Chinese economy.

An effectively fixed value of Yuan was a factor that strongly helped to decrease high inflation of the 1980s and 1990s and slow revaluation before the global financial crisis helped to decrease inflation further and to stabilize the Chinese economy.

GDP figures are not as conclusive as the data about CPI inflation. GDP growth seems to be negatively affected by external crises but it is not possible to say whether monetary policy of fixed exchange rate has a positive or negative impact.

So in case of China the first hypothesis does not seem to be valid. It seems that the opposite may be the truth. In case of China the monetary policy of fixed exchange rate regime might really help to stabilize the economy when a financial crisis out broke. It is though necessary to say that this positive outcome for China may be caused also by another factor. This would be the broadly criticized value of the Chinese currency. A fixed exchange rate in combination with an undervalued currency seems to have worked well in case of China.

4.3.5. Review of usage of FX reserves in China (second MT hypothesis)[63]

China holds an astonishing amount of foreign exchange reserves. According to China Securities Journal the total amount is 2,45 trillion worth of USD. The composition is 65% in dollars, 26% in Euros, 5% in pounds and 3% in yen.[64] This composition is quite risky if the USD should significantly depreciate.

The biggest advantage of holding large amounts of reserves it the psychological stabilization. There is just not enough speculative capital in the world to fight with Chinese monetary authorities. This fact alone contributes to a bigger stability of Chinese macroeconomic environment.

If I come back to the second hypothesis then I have to say that the sole existence of huge FX reserves can probably soften effects of global financial crisis. Monetary authorities can use part of these reserves to boost domestic money supply and hope that it will help the domestic economy. This policy is though problematic from the longer-term perspective because it could lead to high inflation.

China is an export oriented country. If financial crisis affects markets to which Chinese companies do export their goods the demand for Chinese goods will decrease. A direct usage of FX reserves to boost foreign demand for Chinese goods would be both risky and also complicated.

Another problem of Chinese reserves is the social cost of holding excess of FX reserves (see chapter 1.6.1.).

The second hypothesis can be thus marked only partly as a valid statement.

[63] Foreign exchange reserves may help a country to get out of a financial crisis.

[64] Guestposter. *China Offers Rare Glimpse Into USD-Heavy FX Reserve Composition, Warns Of USD Depreciation Risk*, [online], September 3, 2010, [ref. 2010-09-14], Accessible from WWW: < http://www.investingcontrarian.com/index.php/financial-news-network/china-offers-rare-glimpse-into-usd-heavy-fx-reserve-composition-warns-of-usd-depreciation-risk/>

5. Bolivarian Republic of Venezuela

Venezuela of 19th century was mainly under a dictatorship rule. Generally the political situation was unstable and turbulent. In the first half of the 20th century Venezuela was still under dictatorship rule. A big change of the situation came in the 1922 when the first oil was found. In the 1940s the government managed to negotiate with foreign oil companies a rule under which revenues from oil had been split by a law between the government and the oil companies. This law remained unchanged until 1976 which was the year of effective nationalization of the oil industry.

Democratic principles and first democratic elections came to Venezuela in 1959. The current president is Hugo Chavez. He is in the office since 1999. He "*seeks to implement his "21st Century Socialism," which purports to alleviate social ills while at the same time attacking capitalist globalization and existing democratic institutions.*"[65]

5.1. Political system

Venezuela is a federal republic. Majority of political spectrum is divided between two political parties. These are *United Socialist Party of Venezuela* and the opposition party *A New Era*. The current president Hugo Chavez is a strong critic of the United States, neoliberalism and globalization. One of his goals when he took the office of the president was to make Venezuela less dependent on the oil industry.

Chavez managed to implement new constitution and change even the name of the country to Bolivarian Republic of Venezuela. He has close relation with Cuba and Fidel Castro. Through good Venezuelan relationship with several other Latin American countries Hugo Chavez intends to counter the influence of the United States. Close relationship with Russia and Iran are causing some international controversy.

In 2008 Chavez expelled the US ambassador and consequently USA expelled the Venezuelan ambassador. This conflict was solved in 2009 when both ambassadors could return. [66]

5.2. Economy in general (GDP, unemployment, inflation)

[65] The world factbook. *Introduction: Venezuela*, [online]. [ref. 2010-09-19]. Accessible from WWW: <https://www.cia.gov/library/publications/the-world-factbook/geos/ve.html/>
[66] The world factbook. *Economy: Venezuela*, [online]. [ref. 2010-09-19]. Accessible from WWW: <https://www.cia.gov/library/publications/the-world-factbook/geos/ve.html/>

Venezuelan economy is dominated by the petroleum industry which accounts for 90% of export earnings, about 50% of the federal budget revenues and around 30% of GDP.

The actual economic history of Venezuela has a truly fascinating development. For several decades before 1980s it was the second fastest growing economy in Latin America with average GDP growth of 5,025% in the period 1958-1980. Venezuela had in this period consistently low inflation rates averaging 3,314% (see figure 24). In period of 1958-1988 Venezuela also maintained one of the most stable and democratic systems in Latin America.

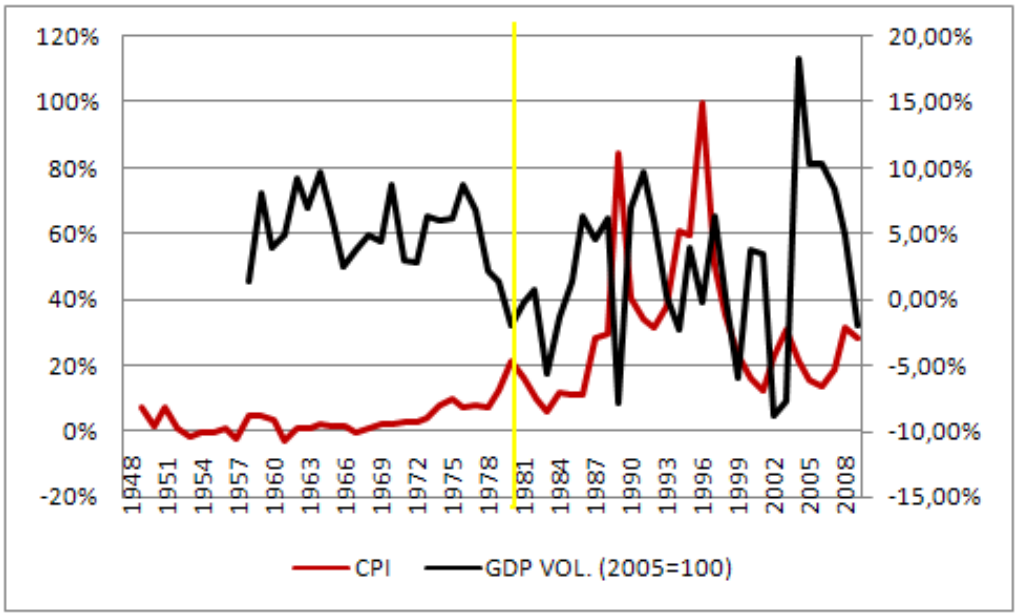


Figure 24. CPI; GDP growth rate with base 2005 (%) (1948-2009)

Source: IMF Statistics (data compiled by author of the MT)

The period 1988-2002 on the other hand was marked by the worst per capita income declines in Latin America. Also the percentage increases in poverty and income inequality have been one of the highest in Latin America.[67] GDP has been extremely volatile. The year 1980 was marked by the highest inflation rate in many decades of 22%. But the highest inflation rates severely affected Venezuela around 1990 and 1996. In these years rates of inflation were 84% and consequently 100%.

By analyzing figures 25a and 25b we can see that from 1996 until nowadays the persistently high inflation came down to relatively lower and more stable rates of around 30%. The GDP growth rates remained though very volatile.

[67] DIJOHN, Jonathan. THE POLITICAL ECONOMY OF ECONOMIC LIBERALISATION IN VENEZUELA, Development Research Centre LSE, June 2004, p. 1

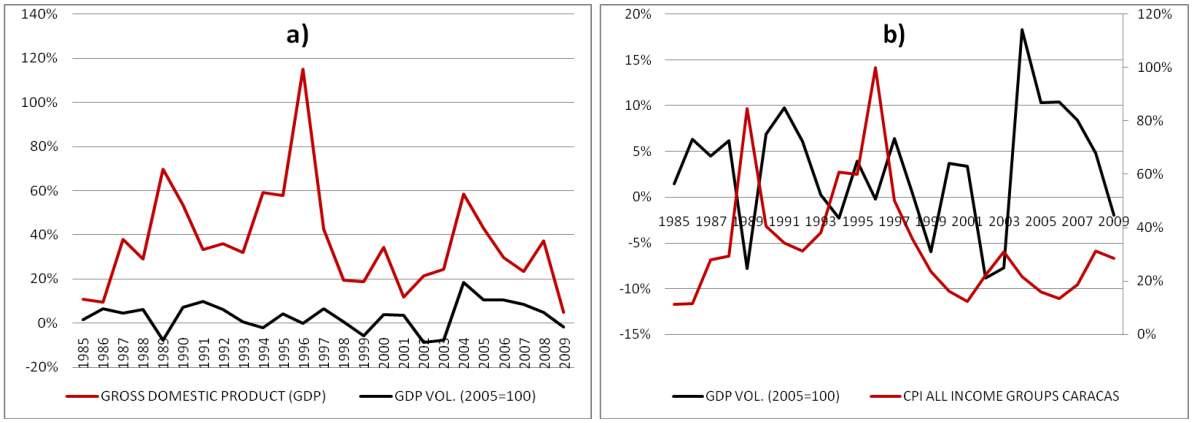


Figure 25a. Rates of GDP, Rates of GDP with base of 2005 (Venezuela) 1985-2009
Figure 25b. Rates of GDP with base of 2005; CPI (Venezuela) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

Venezuelan GDP growth in period from 1993 to 2003 was abysmal and the growth in unemployment is a reflection of this development. The volatility of Venezuelan growth of GDP is though really startling (see figure 25b). GDP growth has been extremely volatile in the whole period from 1985 to 2009 but the most volatile development took place since 2002 to 2005. In 2002 the Venezuelan GDP contracted 8,86% only to sharply rebound and show 18,23% growth in 2004. This sharp reversal surely had a positive effect on the development of the rate of unemployment.

There are two opposite trends in the development of the rate of unemployment (see figure 26a). The first one started in 1993 and lasted until 2003. In this period the rate of unemployment consistently grew until the peak of 18%. In the same period inflation rates decreased from hyperinflational levels to relatively lower levels. In the second period of 2003 to 2008 the rate of unemployment though dramatically decreased to 7,36% which was the lowest rate in more than a decade. The last data from 2008 and 2009 indicate that there has been a rather small increase in the rate of unemployment. Inflation rate has been in this period relatively more stable and floated around 30%.

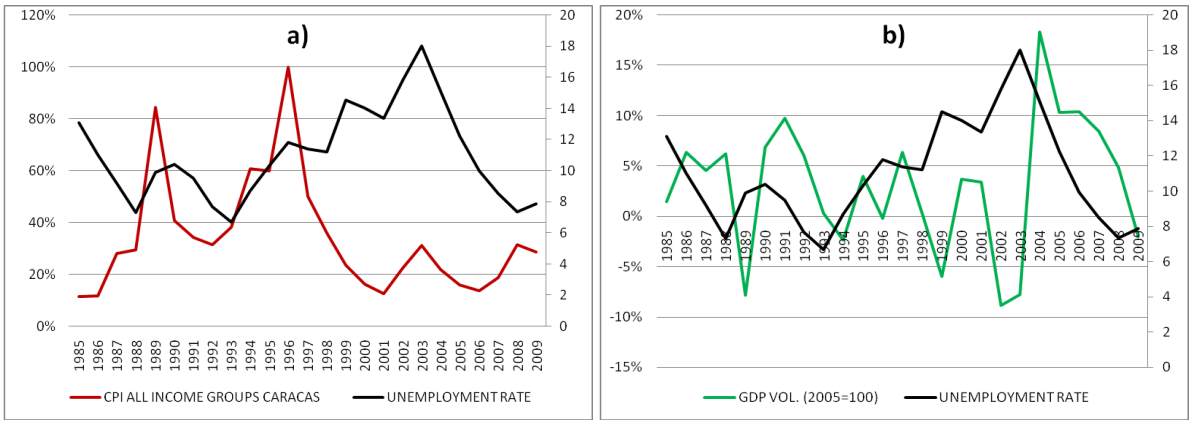


Figure 26a. Rates of CPI and unemployment (Venezuela) 1985-2009
Figure 26b. Rates of GDP growth with 2005 base; unemployment (Venezuela) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

Some of these economic developments have its causes in monetary policy. The fact on the other hand is that a large role in the economic development of Bolivarian Republic of Venezuela is being played also by political decisions made by Hugo Chavez and government. This makes the analysis of impacts of monetary policy much more complicated.

5.3. Monetary policy (recent and past crises)

Venezuelan monetary policy is carried out since 1939 by Banco Central de Venezuela or the BCV (central bank of Venezuela). By law the central bank has full autonomy and should have a total independence in creating and implementing monetary policies. In real world the central bank is being influenced by government and cannot be marked as independent.

"*The fundamental objective of the Venezuelan Central Bank is to achieve price stability and preserve the internal and foreign exchange value of the monetary unit.*"[68]

"*The functions of the Venezuelan Central Bank shall include those of formulating and implementing monetary policy, participating in the design of and implementing foreign*

[68] *Constitución de la República Bolivariana de Venezuela*, [online]. [ref. 2010-10-16]. Accessible from WWW: < http://www.embavenez-us.org/index.php?pagina=constitution/title_vi.htm&titulo=Government/>

exchange policy, currency regulation, credit and interest rate, administrating international reserves and any others established by law."[69]

The main problem of Venezuelan central bank is the dominance of fiscal policy. The role of central bank is also worsened by the fact that it is the government which announces the annual inflation targets. BCV only then does establish corridors for the growth of the monetary base.[70]

Venezuela keeps its currency strictly pegged to the USD and falls into IMF's group of *other conventional fixed peg arrangement*. The value of the Venezuelan currency (the Bolivar) is though continually decreasing since the 1985.

5.3.1. Past economic problems and responses of authorities

The period until 1997 was similarly as in the case of China a time of extremely high inflation (see figure 26a). The CPI averaged in this period at 44,6%. The interesting thing though is the development of the money growth ratio and specifically a comparison of the years 1994-1996 and 2006. In 1994 and 1996 the rate by which the amount of money grew in the economy was exceptionally high. In 1994 it grew by 139% and in 1996 it grew by incredible 152%. In the same period the CPI inflation was also hitting an all time high. In 1996 the CPI grew by 100%.

But this is though only the first part of this interesting development. Another peak in the rate at which the amount of money was growing has been in the 2006. I this year alone the amount of money grew by 150%. The interesting thing is that even thought the amount of money in Venezuelan economy grew at such a high pace the CPI did not reflect this dramatic development. The CPI increased only marginally from the rate of 14% in the 2006 to 19% in 2007. In 2008 though the CPI was 31,4%.

This development may suggest that the rate of inflation is affected by another factor.

This factor may be the exchange rate policy. Until 2005 the value of officially pegged exchange rate of Venezuelan Bolivar to USD has been continually decreasing. Since 2005 the value of Bolivar though ceased to decrease and was fixed at 2,147 Bolivars per 1 USD. A logarithmic scale for the development of Bolivar-USD exchange rate (see figure 26b) visually helps to understand this development. From this chart it is evident that the strong devaluation which took place from 1985 to 1996 had its reflection in the rise of the CPI.

[69] *Constitución de la República Bolivariana de Venezuela*, [online]. [ref. 2010-10-16]. Accessible from WWW: < http://www.embavenez-us.org/index.php?pagina=constitution/title_vi.htm&titulo=Government/>
[70] *VENEZUELA MONETARY TRANSPARENCY,* Oxford Analytica Ltd, Country Report 2006

Since 1996 the devaluation has not been as dramatic and in the 2005 the official rate ceased to devaluate any more. CPI in this period returned to relatively more stable and relatively lower rates.

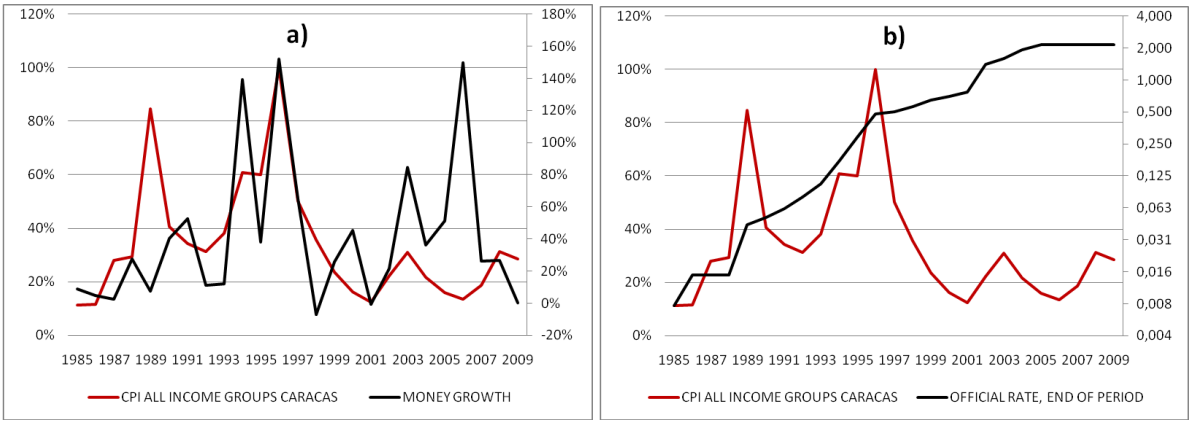


Figure 26a. Rates of CPI and Money Growth (Venezuela) 1985-2009
Figure 26b. Rates of CPI and Logarithmic chart of Exchange rate Bolivar-USD (Venezuela) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

The Asian financial crisis has its repercussions in the whole Latin America. According to some sources nearly 9 billion USD left the region. Massive short-term capital outflows from the region caused recessions. In 1997 Latin America had grown 5.3%, in 1998 growth rate diminished to 2.3% and in 1999 regional GDP growth was only 0.3%.[71]

5.3.2. Current financial crisis (Balance-of-Payments, FX reserves)

Venezuela's economic position immediately before the outbreak of the global financial crisis can be marked as relatively stable and strong. I emphasize the word "*relatively*" because it is relative only to the Bolivarian Republic of Venezuela. A comparison to any other economically strong and stable country would only highlight all the weaknesses of Venezuelan economy.

The GDP growth in 2007 was 8%, CPI was at 19% (which is relatively low rate in last two decades), the rate of unemployment was at 8,5% (which was the lowest rate since 1993).

[71] *TWN Third world network*, [online]. 2000 [cit. 2010-10-11]. The financial crisis of Latin America and the new international financial architecture, Available from WWW: <http://www.twnside.org.sg/title/twr122f.htm>

Be as it may one definitely positive thing for the Venezuelan economy was the large amount of their foreign exchange reserves. These reserves reached in 2007 according to IMF Statistics 23,7 billion USD (see figure 27b). According to Banco Central de Venezuela these reserves were 33,5 billion USD (see figure 27c). The difference in these two numbers is caused by the fact that BCV counts in these reserves also its gold reserves.

The foreign reserves nearly doubled since 2003 to 2005 because of the sharp increase in price of oil. Since then the rise in foreign exchange reserves has not been as rapid and according to data from Banco Central de Venezuela since 2006 until 2010 the amount of foreign reserves remained flat.

Another positive thing is the current account surplus which remained in positive territory since 1999 (see figure 27a). This was caused mainly by the oil exports.

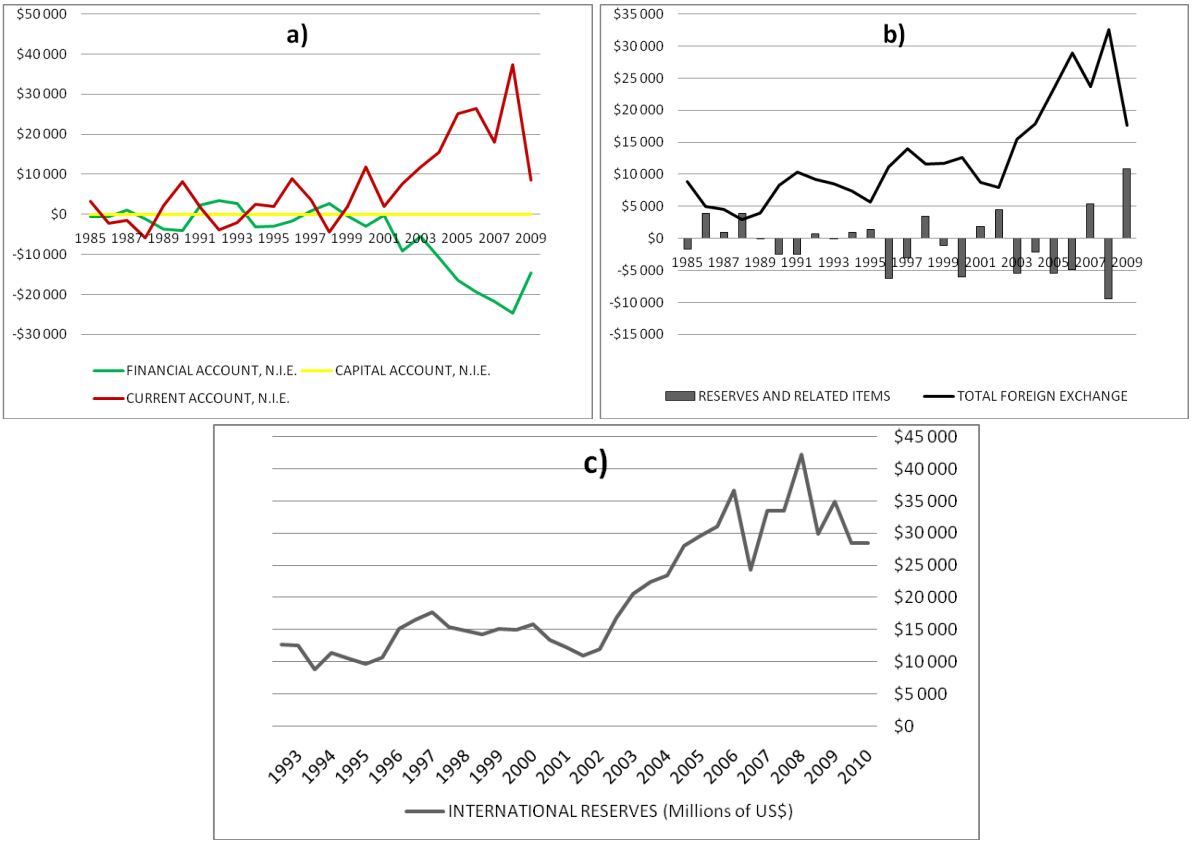


Figure 27a. Current account, capital account, financial account (Venezuela) 1985-2009 (in millions)

Figure 27b. Foreign exchange reserves, TOTAL Foreign exchange reserves (Venezuela) 1985-2009 (in millions) – data from IMF Statistics

Figure 27c. International reserves (Venezuela) 1993-2009 (in millions) – data from Banco Central de Venezuela

Source: IMF Statistics (data compiled by author of the MT), Banco Central de Venezuela

5.3.3. Current financial crisis (Exchange rate policy, NEER, REER)

Venezuela maintains for a long time a conventional fixed peg arrangement. One important thing in the development of the exchange rate policy in pre-financial crisis period is the fact that the Venezuelan currency had been continually devaluated until the year 2005 (see figure 28). Since 2005 the value of Bolivar against USD did not change. This is one factor that could have affected and most probably also did affect the impacts of the financial crisis on Bolivarian Republic of Venezuela. This decision was made in time when Venezuelan GDP grew annually 10% and CPI has been at relatively low at 16%.

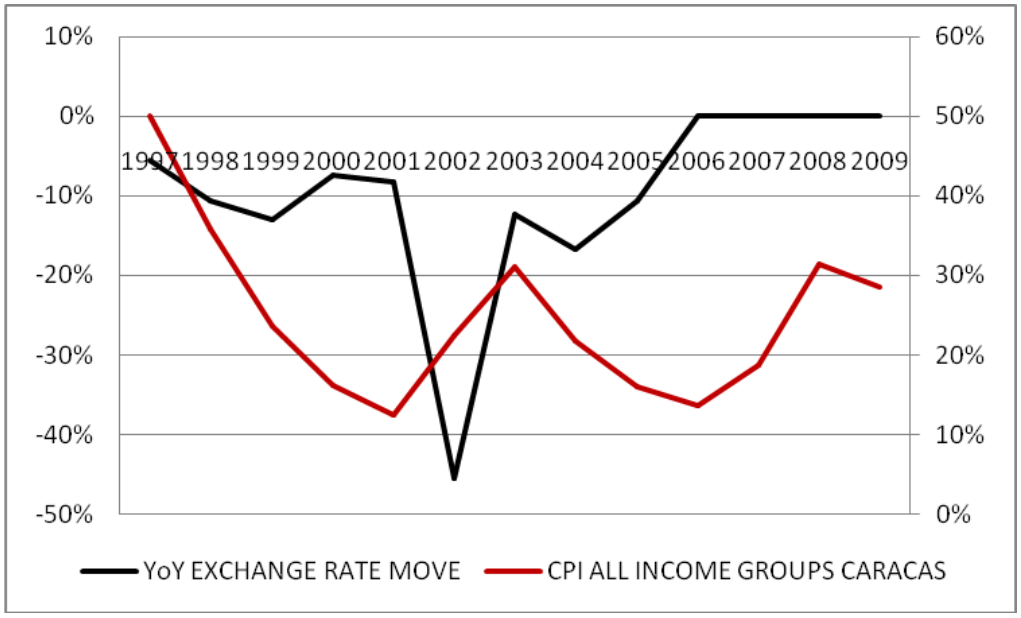


Figure 28. YoY Exchange rate move Bolivar-USD (Venezuela) 1997-2009

Source: IMF Statistics (data compiled by author of the MT)

Interesting is that the inflation did not start to gradually decrease (see figure 28). Since the year 1997 CPI dramatically decreased from levels around 50% to levels around 20% in 2005. In the same period the value of Venezuelan currency has still been continually devaluated. The one exceptionally sharp devaluation has been in the year 2002. Since the year 2005 the CPI grew from 14% to 29%. This suggests that fixing the value of exchange rate did not bring more stability to the development of CPI.

The interest rate policy differs a lot from the case of China. It seems that the internal problems of Venezuelan economy and specifics of its strong dependence on oil exports did not cause similar actions as in developed and some developing countries. From the figure 29b we can see that in the months which preceded the global financial crisis the BCV did in 2008 increase (and then in 2009 decreased) the lending rate only marginally. From 28,5% to 33,5% and then back to lower level of 29,5%.

A very interesting development can be noticed in the chart of Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) (see figures 29c). The NEER is strongly affected by very high rates of CPI and is thus far better to make analysis based mainly on the REER. Since the year 2005 the value of REER had risen from 100 to slightly above 200 in the end of 2009. This is an expression of the fact that the international competitiveness of Venezuelan economy had dramatically worsened just in 5 years.

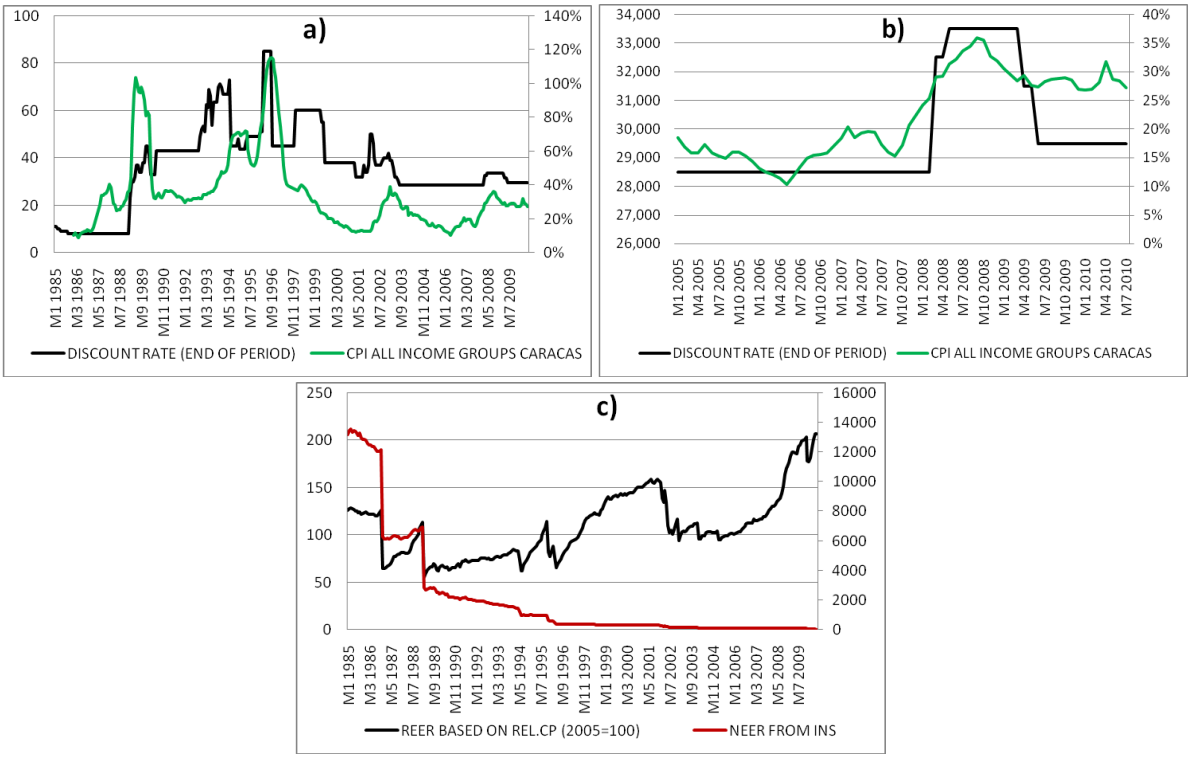


Figure 29a. Discount rate (%), CPI Change (%) (Venezuela) 1985-2010
Figure 29b. Discount rate (%), CPI Change (%) (Venezuela) 2005-2010
Figure 29c. REER, NEER (Venezuela) 1985-2010 Index Numbers (2005=100)

Source: IMF Statistics (data compiled by author of the MT)

5.3.4. Review of fixed exchange rate usage in Venezuela (first MT hypothesis)[72]

Venezuelan Central bank is under control of government. This means that implementation of any independent monetary policy is virtually impossible. Decisions about devaluation, fixing the official exchange rate or usage of the foreign exchange reserves are affected more by the political will than by a rational policy of the BCV. Nevertheless it is still possible to analyze impacts of monetary policy decisions regardless of who made the decision.

Venezuelan economy is strongly dependent on the price of oil and the international demand for oil. Since the beginning of the global financial crisis the demand for oil decreased and price of oil has been cut by half. This caused serious problems to the Venezuelan Balance-of-Payments. Current account surplus had decreased by more than 70%.

The value of exchange rate has been fixed since 2005. Originally this decision was made to help stabilize Venezuelan economy especially to cool down rates of CPI. From previous chapters it is clear that at year 2005 Venezuelan economy was in relatively better state in comparison to previous years. The fact though is that since the year in which the exchange rate has been fixed to the end of 2009 the economic indicators as CPI or GDP growth have only worsened. The rise in CPI may be caused by the fact that in 2006 the amount of money in the circulation has been increased by the central bank by nearly 150%. So it seems that fixing an exchange rate alone cannot help cool down inflation. In fact it seems that a fixed exchange rate in combination with rapid money growth may have done more harm to the Venezuelan economy. GDP growth has been continually decreasing since 2006 from 10,3% to -1,999% in 2009 (see figure 26b).

On the other hand a positive development can be seen in the development of the rate of unemployment which decreased from levels of around 15% to just bellow 8%. Unfortunately when analyzed from the longer perspective of 20 years it becomes clear that the unemployment rate at 15% was unusually high (see figure 26a). This doesn't though change the fact that the unemployment rate has been significantly decreased in just 5 years time.

Over all it is difficult to analyze effects of monetary policy of fixed peg alone. Mainly it is because the central bank is under a strong influence (or maybe better word would be "control") of the government. There is no independent monetary policy. Tools of monetary policy which central bank uses are in the hands of the government. Bolivarian Republic of

[72] Monetary policies of fixed rate regimes may encourage a creation of a financial crisis.

Venezuela suffers from high rates of inflation. The problem is that central bank has to obey all government requests to print more money. This money is then being used mainly for governmental socialist programs. The exchange rate has been fixed since 2005 but a brief look at REER can tell us that a fixed exchange rate did not help Venezuela to gain any competitiveness at all.

Structural problems of Venezuelan economy, political experiments and now the global financial crisis make it very difficult to separate causes and effects. One thing is probably true and this is the fact that a fixed exchange rate alone did not help the Venezuelan economy as it did help the Chinese economy. On the other hand it is not possible to prove that policy of fixed exchange caused the latest Venezuelan economic crisis.

5.3.5. Review of usage of FX reserves in Venezuela (second MT hypothesis)[73]

Bolivarian Republic of Venezuela has accumulated since 2003 substantial amounts of foreign exchange reserves (see figure 30). The main reasons are combination of rising oil prices and a monetary policy of fixed exchange rate. Since 2007 the volatility of foreign reserves (without gold) though started to dramatically pick up. Swings of plus minus 15 billion USD became quite usual. This is partly caused by the Venezuelan government which used several times significant amounts of reserves for funding their socialist programs.

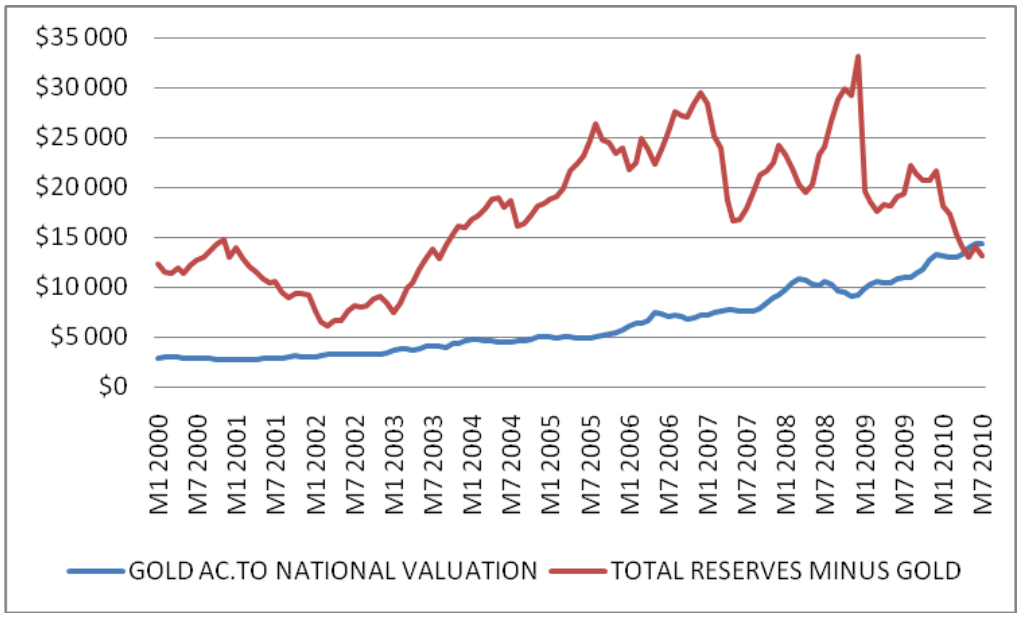


Figure 30. Reserves of Bolivarian republic of Venezuela 2000-2010 (in millions)

Source: IMF Statistics (data compiled by author of the MT)

[73] Foreign exchange reserves may help a country to get out of a financial crisis.

One advantage of holding these foreign reserves is clear. Domestic inflation decreases the value of domestic currency very rapidly and international currency (and gold) creates for Venezuelan authorities a kind of a solid anchor. On the other hand it is probably not the best choice to use these reserves mainly on governmental spending programs and on programs which support domestic consumption. This kind of usage can in short term boost domestic demand and help other macroeconomic indicators. But in the longer term it seems that this policy in combination with specific state and structure of Venezuelan economy only increases rates of CPI.

Venezuelan foreign exchange reserves also are not an unlimited commodity and if Venezuelan authorities continue to spend their foreign exchange reserves in the current trend the day when majority of foreign exchange reserves will be gone may not be so far in the future. This would mean that no more foreign exchange reserves will be used as an anchor or as a stimulus of the domestic consumption.

Volatility of foreign exchange reserves also does not help to stabilize the situation. The pure fact that the amount of foreign exchange reserves has been halved since 2007 does not help either.

Bottom line is that problems of Venezuelan economy are so brought that solely the amount of foreign exchange reserves cannot help the economy to get out of the crisis. It surely is a positive factor but more important than the amount of these reserves is the usage of them by the Venezuelan authorities. It seems that the usage of these reserves is focused only on the short term and possibly also on short sighted goals. In this manner it seems that foreign exchange reserves may be only a minor help in process of getting the Venezuelan economy out of the economic crisis.

6. Kingdom of Denmark

Denmark is a Scandinavian country of approximately 5,5 million inhabitants. It has evolved from a predominantly agricultural export orientated country in 1950[74] (65% of exports were agricultural goods) to broad based exports and service society. Denmark is a prosperous, rich nation and a member of many international organizations.

Denmark is a mixed economy of both capitalism and socialism. It has an exceptionally large welfare system (or welfare state). High taxes and income equality creates in this country a very unique place for its citizens. Standards of healthcare, education and welfare are one of the highest in the world.

Denmark is consistently being ranked by the non-governmental organizations as one of the least corrupt countries in the world. It is also ranked as one of the best places to do business.

6.1. Political system

Denmark is a constitutional monarchy and a parliamentary democracy. The monarch has formal executive powers but these powers are purely ceremonial. Legislative branch is conducted by the parliament and a prime minister (who possesses the real executive power). Usually Danish political system produces coalition governments and political dialogue is thus a necessary and important part of every political decision.

Denmark is a member of the European Union since 1973. There are though several issues in which Denmark has opted-out. These are common citizenship, a common currency, common foreign and defense politics and a common policy on police and legal matters. This is the reason why Denmark has not joined the Euro zone and still has its own currency – the Danish krone (DKK).

Denmark is a founding member of NATO and OECD and it is also a member of the Organization for Security and Cooperation in Europe (OSCE).

6.2. Economy in general (GDP, unemployment, inflation)

Denmark is a mixed economy where both socialistic and capitalistic principles meet and function in a so far impressive way. Denmark is a small export orientated country. It has

[74] Henriksen, Ingrid. "*An Economic History of Denmark*". EH.Net Encyclopedia, edited by Robert Whaples. October 6, 2006. URL http://eh.net/encyclopedia/article/henriksen.denmark

a high tech agricultural sector, world leading companies in pharmaceuticals, maritime shipping and also renewable energy capabilities. The dependence on foreign trade is substantial. Denmark's fiscal position is one of the strongest in the EU.[75] The income inequality is in Denmark one of the lowest in the world.

Denmark is a stable and developed economy. Until the recent global financial crisis it has for long time managed to grow its GDP at sustainable and moderate levels (see figure 31).

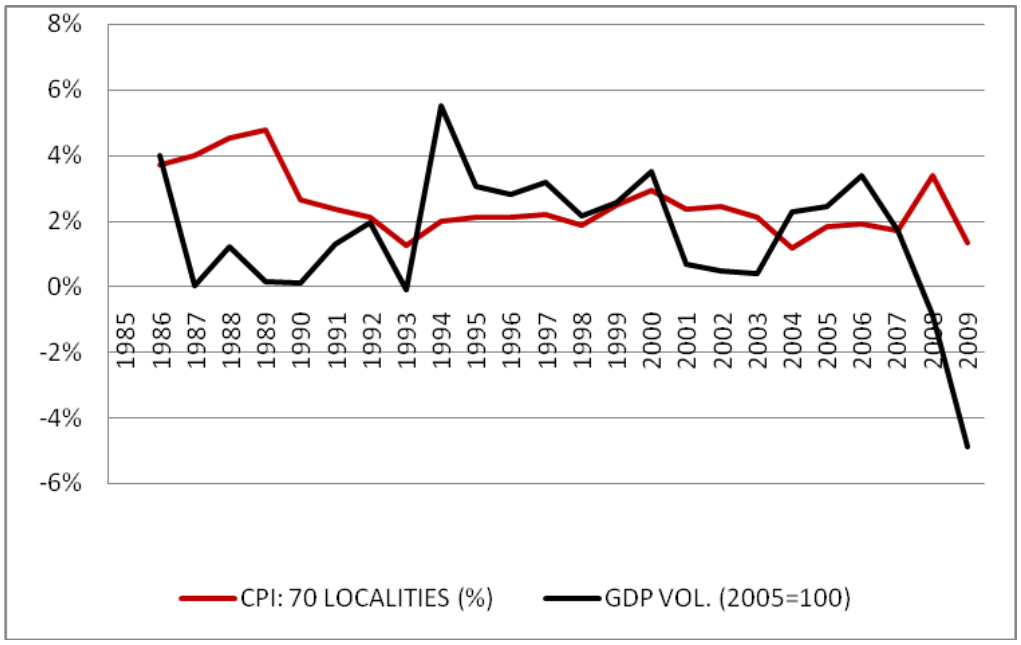


Figure 31. Rates of CPI, Rates of GDP with base of 2005 (Denmark) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

The GDP growth has been sluggish in the period of 1987-1993 but still the GDP did contract only once in this period (in 1993 the GDP contracted 0,1%). Since then until the end of the 2007 the Danish economy grew at an average pace of 2,45% annually. There have not been any volatile years until the beginning of the global financial crisis.

Another very positive fact is that the rates of CPI averaged in the whole period since 1986 till 2009 at only 2,47%. There has been a similar trend in the development of the CPI as in China and Venezuela. It may be only a coincidence but it seems that the development of the CPI in Denmark preceded the development of CPI in China and Venezuela. Since 1986 to

[75] The world factbook. Economy: Denmark, [online]. [ref. 2010-10-28]. Accessible from WWW: https://www.cia.gov/library/publications/the-world-factbook/geos/da.html/>

1993 the rates of CPI came down from more elevated levels and since then they have stabilized. In China the CPI rates stabilized in 1998 and in Venezuela they stabilized in 2001

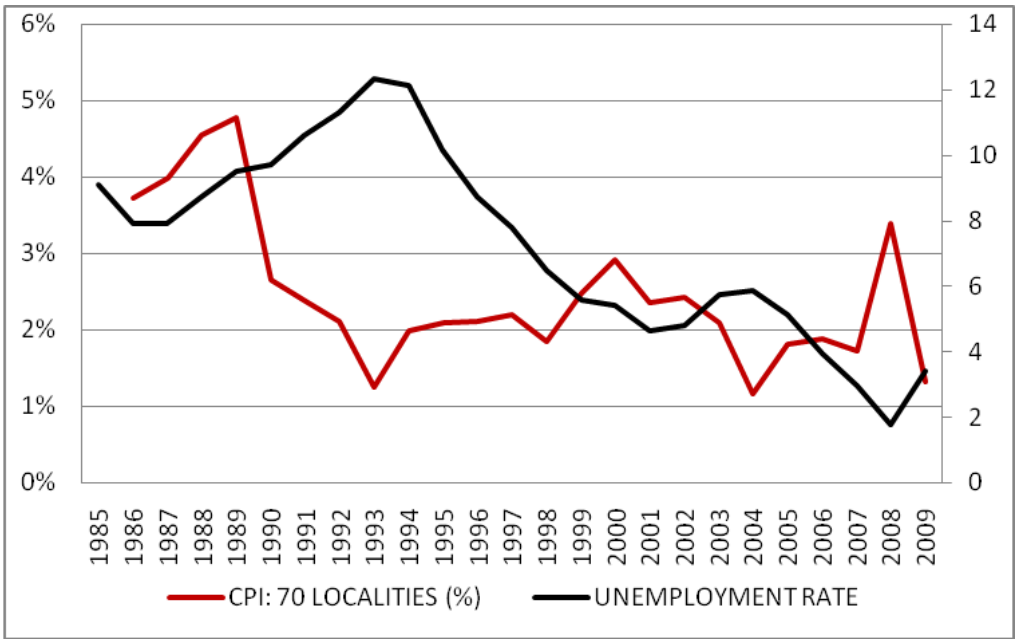


Figure 32. Rates of CPI and unemployment (Denmark) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

Completely different picture from both China and Venezuela can be seen in the unemployment numbers. The rates of unemployed people in Denmark are consistently decreasing already since the 1993 (see figure 32). In 1993 the rate of unemployment has reached a very high level of 12,32%. Since then several Danish governments implemented number of labour market reforms which helped to reduce unemployment significantly. But overall it seems that there is no apparent influence or cause-effect relationship in the relation of CPI and rates of unemployment.

It is possible to divide the development of GDP, inflation and unemployment into three phases. The first one is until 1993. This period was marked by a slower (yet still a not volatile) GDP growth, relatively higher inflation and a rising rate of unemployment. Second period was from 1993 to 2007. In this period Denmark enjoyed a stable GDP growth, low inflation and an ever decreasing rate of inflation. The last period had begun in the 2008. In both 2008 and 2009 the Danish GDP had continuously contracted. In contrast to this

development rates of unemployment were in their all time lows of 1,76% and 3,38%. Rates of inflation had been relatively more volatile.

Some of these developments have their causes directly in the monetary policy of Danish monetary authorities. Some of these developments may have different causes than the monetary policy alone.

6.3. Monetary policy (recent and past crises)

Danish monetary policy is closely tied with the monetary policy of the European Central Bank (further just ECB). This is because the Danish central bank maintains a fixed exchange rate of the Danish Krone and euro.

"*The objective of the monetary policy is to support the overall objective of the exchange rate policy, namely to maintain a fixed exchange rate vis-à-vis the euro. The monetary policy is primarily conducted via the very short term interest rates. In practice, the Danish central bank steers the very short term interest rates by setting the official discount rate and the central bank's lending rate. The overall objective of keeping the exchange rate fixed vis-à-vis the euro implies that the monetary policy and the exchange rate policy are tightly connected.*"[76]

Denmark participated in the original ERM (Exchange Rate Mechanism) and is also currently participating in the ERM II. ERM II is a mechanism where EUR is an anchor currency. Objective of this mechanism is to secure exchange rate stability between the Euro zone and a state which participates in ERM II. ERM II was established along with the introduction of the euro on 1 January 1999. Since this date Denmark participates in ERM II. In 2000 there was a referendum in Denmark which though rejected a membership in the euro zone.

6.3.1. Past economic problems and responses of authorities

Denmark has not suffered directly any major economic crisis. Overall the economic development since 1985 has been stable. One of the few topics which had been more widely discussed has been the widening of bands of the original ERM in 1993 from 2,25% to 15%. This has been done as a reaction on speculative attacks on several European currencies. Denmark preferred the old system of narrower bands because of fears that wider bands will

[76] *Danish Monetary and Exchange Rate Policy*, [online]. [ref. 2010-11-02]. Accessible from WWW: <http://uk.fm.dk/Portfolio/International%20cooperation/EU%20economic%20and%20political%20coordination/Danish%20Monetary%20and%20Exchange%20Rate%20Policy.aspx/>

cause unwanted volatility. The fact though is that the widening of these bands decreased the overall exchange rate volatility (see figure 33).

Another trend can be seen as already mentioned in the development of CPI. The CPI has been consistently decreasing until the year 1993. It went down from a peak of 4,8% in 1989 to 1,3% in 1993. During the same period the Danish Krone appreciated against the EUR for 5,1% (see figure 34b).

It seems that the reduction in volatility and a fixed exchange rate of DKK-EUR had helped to stabilize and cool down the rates of CPI.

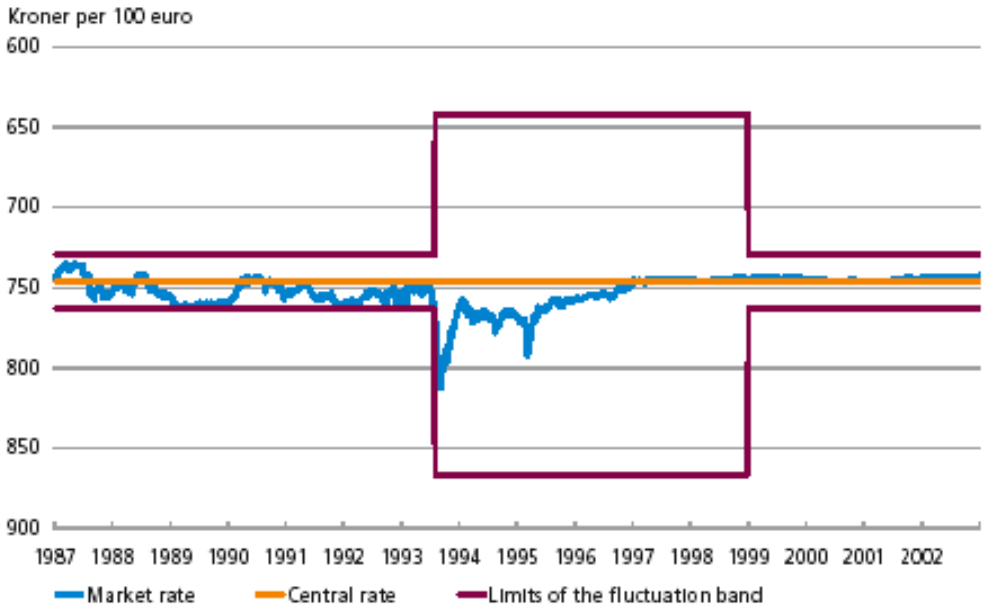


Figure 33. Exchange rate of the krone vis-à-vis the euro

Note: Before 1999, a synthetic krone rate vis-à-vis the euro is applied, calculated on the basis of the krone rate vis-à-vis the D-mark and the D-mark-to-euro conversion rate fixed at 1 January 1999.[77]

Source: Danmarks Nationalbank

An interesting development can be seen in the chart of money growth (see figure 34a). It seems as if the volatility of growth of money did not cause any major increases to the volatility of CPI. This volatility has its two peaks in 1993 and 2005 when the amount of money grew each year at around 20%.

[77] Monetary policy in Denmark, The Monetary- and Foreign-Exchange-Policy Instruments, Chapter 1, Chart 1.3 , [online]. [ref. 2010-11-02]. Accessible from WWW: <http://www.nationalbanken.dk/C1256BE9004F6416/side/Monetary_Policy_in_Denmark/$file/kap02.html#01-1-1/>

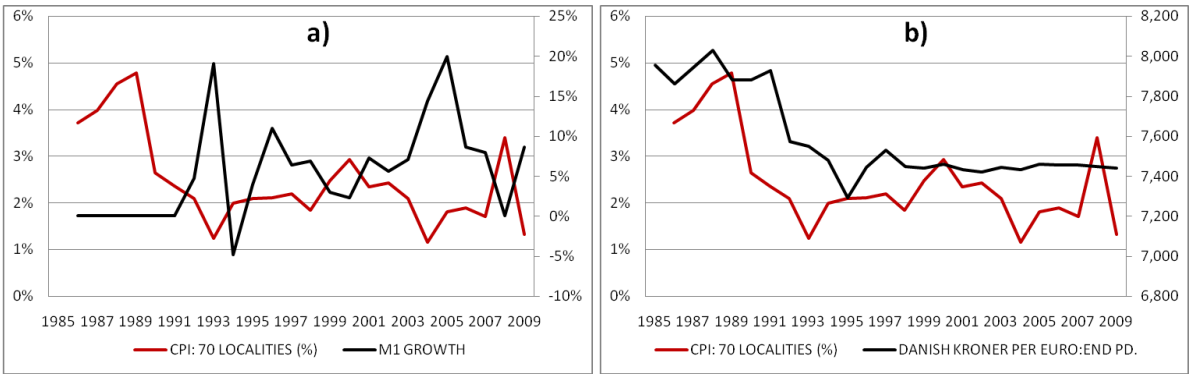


Figure 34a. Rates of CPI and Money Growth (Denmark) 1985-2009
Figure 34b. Rates of CPI and Exchange rate Danish Kroner-EUR (Denmark) 1985-2009

Source: IMF Statistics (data compiled by author of the MT)

6.3.2. Current financial crisis (Balance-of-Payments, FX reserves)

Before the current financial crisis Denmark's position has been a very strong and stable. From figures 31-34 it is clearly visible that GDP growth was stable and solid, CPI at stable and low levels and unemployment at historically low levels. At the end of 2007 GDP growth was 1,7%, CPI was also 1,7% and unemployment rate was 2,93%.

A very interesting development can though be seen in the development of the balance-of-payments. In 2002 for the first time since 1985 the amount of FX reserves topped the level of 25 billion USD (see figure 35b). The rise of FX reserves was actually gradual over the whole period from 1985. The most significant increase of FX reserves can be seen in the year 2009. This strong increase is mainly because both the current and financial account of the balance-of-payment were significantly positive (see figure 35a).

This development is interesting because in period of 2003-2007 the financial account has been relatively more negative than in the period of 1985-2002. But since the beginning of the global financial crisis the financial account went from being negative into being significantly positive. Current account does not seem to be affected by this crisis although in the 2009 it was in the highest surplus since 1985. This situation is a very similar one in comparison with the China which also has a current account and financial account significantly positive. Both of these developments and a fixed exchange rate policy meant that the FX reserves will significantly increase.

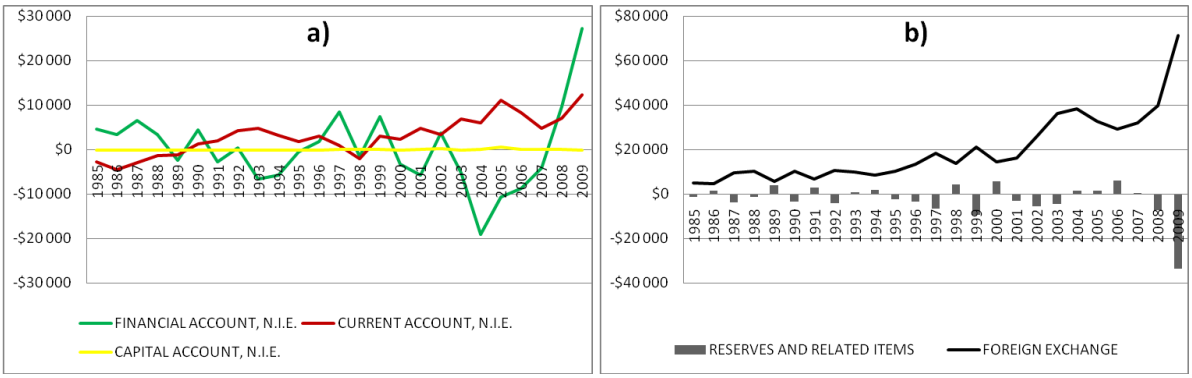


Figure 35a. Current account, capital account, financial account (Denmark) 1985-2009 (in millions)
Figure 35b. Foreign exchange reserves, TOTAL Foreign exchange reserves (Denmark) 1985-2009 (in millions)

Source: IMF Statistics (data compiled by author of the MT)

6.3.3. Current financial crisis (Exchange rate policy, NEER, REER)

Because of the fact that the exchange rate of Danish Krone is fixed to the EUR the monetary policy of Denmark is effectively transferred to the European Central Bank. Fixed exchange rate provides visible benefits to the Danish economy and society. It suppresses exchange rate volatility and offers Danish companies a stable environment for their decision making process. "*The primary objective of the ECB's monetary policy is to maintain price stability. The ECB aims at inflation rates of below, but close to, 2% over the medium term.*"[78] And because of this primary objective of ECB the fixed exchange rate system ensures low rates of inflation.

Since 1985 until 1998 the value of DKK has been continuously appreciating but since 1998 the exchange rate between DKK and EUR has stayed on average at rate 7,447 (see figure 34b). Even in the years of global financial crisis the Danish central bank successfully managed to keep the value of DKK fixed.

The interest rate policy and actions of Danish central bank has been similar to most of the developed world. Since 2006 until 2008 the Danish central bank has increased the discount rate several times only to sharply turn around and decrease it from 4,5% in 2008 to 0,75% in 2010 (see figure 36b). The inflation has significantly spiked only once in the whole

[78] Monetary policy - objective, European Central Bank, [online], [ref. 2010-11-03], Accessible from WWW: < http://www.ecb.int/mopo/html/index.en.html/>

period of 2004-2010 and this was shortly in the end of 2008. Overall the CPI has been stable and relatively low.

The effect of a low inflation can be noticed in the development of NEER and REER. Values of these indices are nearly the same and diverge only marginally in the beginning of 2008 (see figure 36d). According to the development of these indices it seems that Denmark has lost some international competitiveness in the period from the middle of 2007 to the end of 2009. But in the 2010 all the lost competitiveness has been regained. This underlines the ability of Danish economy to withstand well in the international competition which is a very positive ability for an export oriented country.

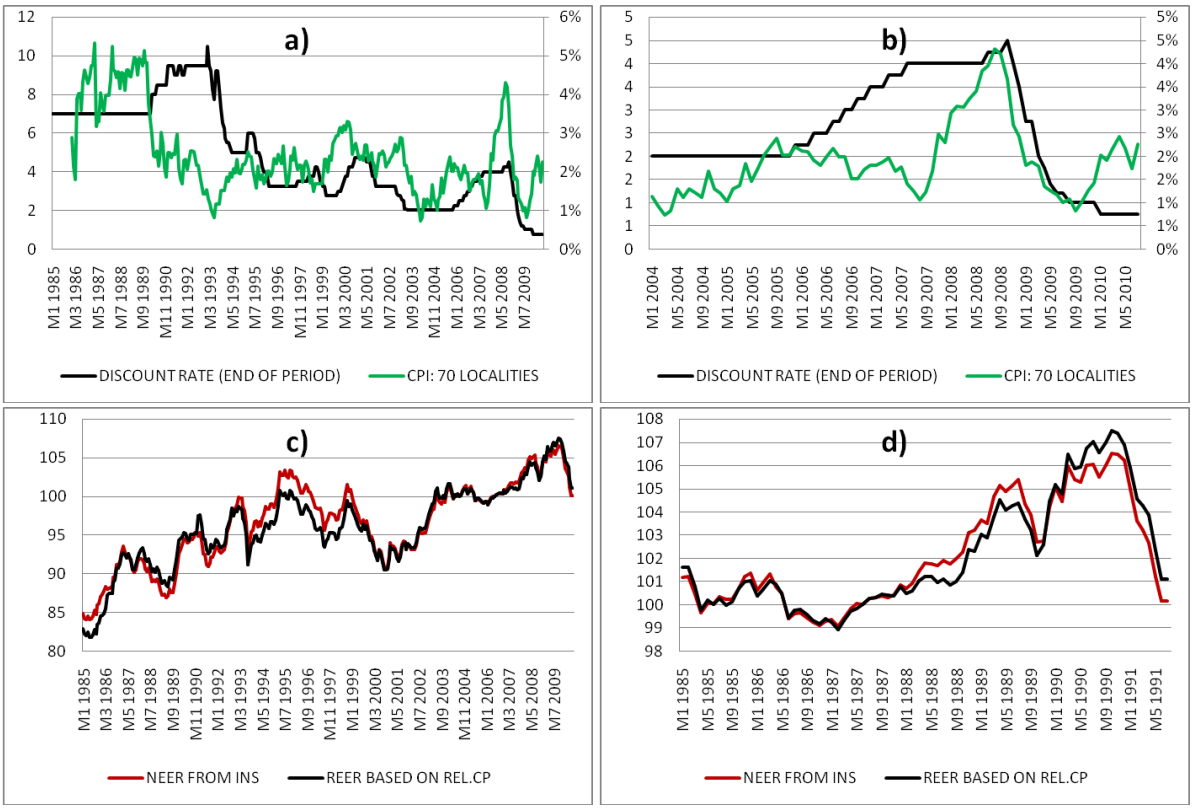


Figure 36a. Discount rate (%), CPI Change (%) (Denmark) 1985-2010
Figure 36b. Discount rate (%), CPI Change (%) (Denmark) 2004-2010
Figure 36c. REER, NEER (Denmark) 1985-2010 Index Numbers (2005=100)
Figure 36d. REER, NEER (Denmark) 2004-2010 Index Numbers (2005=100)

Source: IMF Statistics (data compiled by author of the MT)

6.3.4. Review of fixed exchange rate usage in Denmark (first MT hypothesis)[79]

[79] Monetary policies of fixed rate regimes may encourage a creation of a financial crisis.

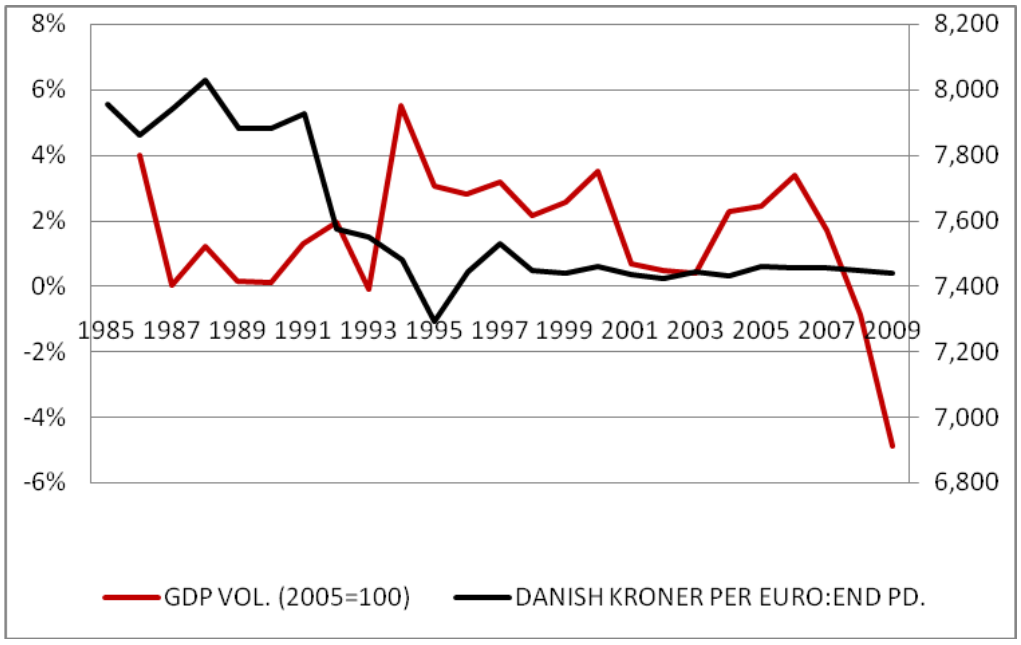
In the case of Denmark the first MT hypothesis seems to be false. Denmark enjoys an exceptionally stable GDP growth, low inflation and low rates of unemployment. Since 1988 the exchange rate of DKK-EUR has not been changed which means that this policy offered a very stable environment for the export industry, domestic importers and domestic consumers.

Until the year 1998 the DKK continuously appreciated against the EUR. This surely helped to cool down the rates of CPI (see figure 34b).

"*The fixed exchange rate system plays a pivotal role in the Danish economic policy, and has contributed significantly to today's strong Danish economic performance.*"[80]

The overall good economic results of Danish economy cannot be connected only to its fixed exchange rate policy but it surely had its significant impact on the overall development of the economy. It is though important to remember that Denmark is one of the Nordic economies which mix both the capitalistic and socialistic concepts together. Denmark on its own has a very unique place in the world. This has been achieved by deep structural reforms of the whole economy.

The concept of stability as one of the main goals in the monetary policy is really only a one visible example of the idea how the whole Danish economy and society should function. And in the current global financial crisis it seems to have functioned well.



[80] Danish Monetary and Exchange Rate Policy, Danish Ministry of Finance, [online], [ref. 2010-11-03], Accessible from WWW: < http://uk.fm.dk/Portfolio/International%20cooperation/EU%20economic%20and%20political%20coordination/Danish%20Monetary%20and%20Exchange%20Rate%20Policy.aspx/>

Figure 37. Official rate DKK-EUR; GDP growth rate with base 2005 (%) (1985-2010)

Source: IMF Statistics (data compiled by author of the MT)

There is one point in the recent history at which the Danish currency fluctuated more than usually. This was in the year 1993 (see figure 33). This fluctuation has been caused by the speculative currency attacks on some of the European countries. This was the only year since the 1985 until the start of the global financial crisis in which the Danish GDP contracted (see figure 37).

6.3.5. Review of usage of FX reserves in Denmark (second MT hypothesis)[81]

The amount of the FX reserves has been gradually increasing since 1985. In 2002 these reserves topped the level of 20 billion USD. But since then until the end of 2009 the FX reserves have more than tripled. The highest levels of the amounts of FX reserves which are being held by the Danish central bank were reached in the years in which the global financial crisis took place.

In case of Denmark the second MT thesis does not seem as relevant as in the case of Venezuela (where the FX reserves are being used to stimulate domestic demand) or as in the case of China (where number of economists argue that the exchange rate of Renminbi is undervalued and one of the consequences is a buildup in Chinas FX reserves). Denmark does not use the FX reserves to stimulate the economy and the value at which the DKK is fixed to the EUR is not being criticized as undervalued. It seems that the buildup in the Danish FX reserves is more of a natural process which reflects the strength of the economy and a decision to have a fixed exchange rate.

Overall it is difficult to decide whether the second MT hypothesis can or cannot be marked as valid because Danish monetary authorities just do not explicitly use the FX reserves to do anything in particular. More than anything concrete the amount of reserves reminds investors and speculators that Danish central bank has its means to maintain the exchange rate and to defend it if necessary.

[81] Foreign exchange reserves may help a country to get out of a financial crisis.

7. Czech Republic

The Czech Republic had undergone a number of significant changes throughout the entire 20th century. It was a young though a strong democracy in the period of 1918-1938. The economy was flourishing until the great depression which started in 1929. Since then the Czechoslovakia had a hard time getting back on the track of pre crisis prosperity.

After the communist coup Czechoslovakia became a communist country. This lasted since 1948-1989. The era of communism brought a strong centralization of the whole economy. The free market principles have been abandoned. Czechoslovakia continued to function and develop as an industrialized economy with a focus on foreign trade. It has been one of the best performing countries in the whole Soviet block but the rates of growth which were seen in the Western Europe were still far away.

The last episode of the history of Czechoslovakia (later the Czech Republic and Slovakia) begun after the Velvet Revolution in 1989. The Czech Republic again became a parliamentary democracy with free market capitalist economy. As so called "emerging market" the Czech Republic became a rapidly growing country which was in 2006 marked by the World Bank as a "developed economy".

Czech Republic is a member of European Union and OECD.

7.1. Political system

The Czech Republic is a parliamentary democracy. The president is a formal head of the state and can return bills to the parliament. Executive branch is being lead by prime minister.

The electoral system produces very often coalition governments. Political dialogue is thus a necessary part of everyday politics. The 2010 parliamentary elections produced an unusually strong coalition government of "budgetary discipline" which seems to be committed to do deep reforms in the current system.

7.2. Economy in general (GDP, unemployment, inflation)

The Czech Republic is known as one of the most stable and prosperous post-Communist state in the Central and Eastern Europe. It is an opened and export oriented country. Its dependence on exports makes it extremely vulnerable to any decreases in demand in foreign markets.

The growth rates of GDP since 1994 were one of the highest in the whole group of emerging markets. Until the begging of the global financial crisis the average growth rate of real GDP was 3,85%. In this period the Czech Republic underwent one currency crisis and a reflection of that can be seen in the figure 38. This crisis took place in 1997. GDP contracted not only in 1997 for 0,7% but also in 1998 for 0,8%.

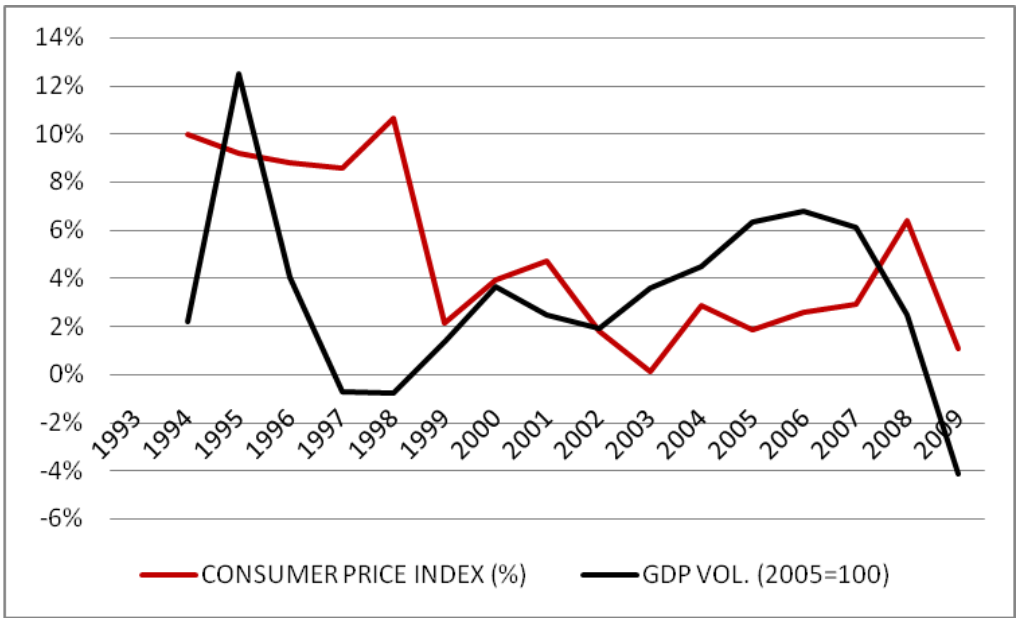


Figure 38. Rates of CPI, Rates of GDP with base of 2005 (Czech Republic) 1993-2009

Source: IMF Statistics (data compiled by author of the MT)

Since the division of Czechoslovakia in 1993 the Czech Republic had suffered from high rates of inflation. This was though in combination with relatively low rates of unemployment (see figure 39). It is interesting to notice that the CPI and the rates of unemployment move in the opposite directions. In 1999 CPI decreased to historically low levels. This was mainly an effect of actions of the Czech national bank (further just CNB). In the same period the rate of unemployment more than doubled. The rate of unemployment hit its all time high in 2004 of 9,93%. In 2003 the rate of CPI hit its all time low of 0,1%. Since then these two economic indicators always moved in the opposite direction.

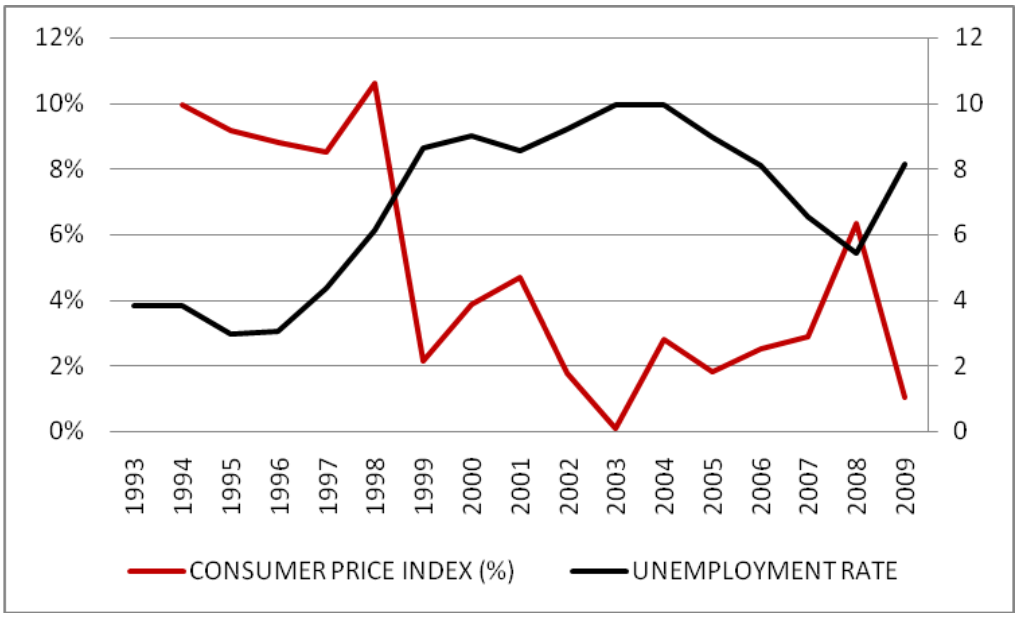


Figure 39. Rates of CPI and unemployment (Czech Republic) 1993-2009

Source: IMF Statistics (data compiled by author of the MT)

It seems natural to divide the rather short period of 1993-2009 to three separate periods. The first one took place since 1993 until 1999. This period can be viewed as a period of wild consolidation and transition to a new politico-economical regime. This period has been ended by a currency crisis and an abandonment of fixed exchange rate regime.

Second period took place since 1999 until the beginning of the global financial crisis in the end of 2007. This is a period of relatively strong economic growth, relatively low and stable inflation and a relatively high unemployment rate. The GDP averaged in this period at 4,08%, inflation at 2,53% and unemployment rate at 8,75%.

The last period started in 2008 with the beginning of the global financial crisis.

7.3. Monetary policy (recent and past crises)

The Czech monetary policy is carried out by the CNB. CNB is an independent institution and its objective is set up in the Constitution of the Czech Republic.

"The CNB's monetary policy objective is to maintain price stability. Without prejudice to its primary objective, the CNB shall support the general economic policies of the Government leading to sustainable economic growth.."[82]

In December 1997 the CNB made a decision to change its monetary policy regime to inflation targeting. This new policy came into effect in the beginning of 1998. This change did not mean any change in the objective of the monetary policy. It only changed the method of achieving this objective.

7.3.1. Past economic problems and responses of authorities

Until 1997 the Czech National bank maintained a monetary policy regime of fixed exchange rate. One of the main problems from the Central Bank's point of view was the high inflation (see figure 40a). Another thing that was typical for this period was a high interest rate differential. High interest rates in this period caused a large inflow of foreign capital. But because of the system of fixed exchange rates there has not been any significant appreciation of the actual exchange rate. This pressure for appreciation has been countered by the CNB which has been intervening on the FX market.

These interventions had to be then sterilized. Without sterilization through selling bonds the pressure of increased money supply would be harmful to the Czech economy. This is actually the reason of high interest rates because in order to sell such a high amount of bonds the interest rate had to be quite high. The problem though is that these sterilizations had not been done to the full extent and the rate at which the amount of money grew in the economy has been exceptionally high (see figure 40a). In the period of 1993-1996 the amount of money in the Czech economy grew at an average annual pace of 30,8% which is by any means a really high growth.

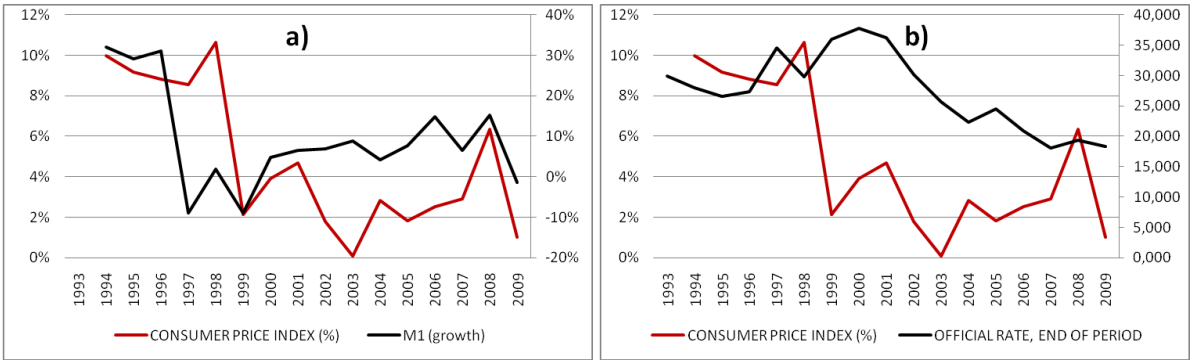


Figure 40a. Rates of CPI and Money Growth (Czech Republic) 1993-2009

[82] *The objective of monetary policy*, [online]. [ref. 2010-11-04]. Accessible from WWW: < http://www.cnb.cz/en/monetary_policy/objective.html#b2 />

Figure 40b. Rates of CPI and Exchange rate CZK-USD (Czech Republic) 1993-2009

Source: IMF Statistics (data compiled by author of the MT) and Czech National Bank Statistics

In 1996 the CNB decided to significantly widen bands of oscillation which effectively meant that the exchange rate regime was still fixed but now with wide horizontal bands.

In the moment when the currency crisis out broke the CNB countered with interventions and with sharp and temporary increases of its interest rates. At the end the CNB had announced that the currency is transitioning from being fixed to new system of managed free floating.

From the figure 40a it is visible that the rate of CPI trails the development of the rate in which the amount of money in the economy is growing. A sharp change of money growth, where in 1996 the rate of M1 growth was 31% and in 1997 the M1 actually decreased by 8,9%, can bring drastic shocks to the economy. One of the outcomes though was a significant decrease in the rate of CPI in subsequent years. CPI decreased from rates of around 9% to just 2% in 1999.

7.3.2. Current financial crisis (Balance-of-Payments, FX reserves)

The Czech Republic is an open and export driven economy. Its balance of payments more or less produces consistently several trends. Primary it is the continual current account deficit. From 1994 the deficit of current account averaged at -3047 billion USD. From 2004 the volatility of this deficit became more significant. Since the begging of the global financial crisis the current account deficit remained relatively low.

The financial account shows an opposite development. From 1994 the surplus of the financial account averaged at 5176 billion USD. From 2004 the volatility of this deficit actually decreased. One of reasons is that the inflow of large foreign direct investment decreased.

The development on the capital account is predominantly affected by emission allowances.

Over all the balance of payments has been in deficit only in 1996 and 1997 (see figure 41b). This can be marked as a positive sign but the fact is that the growth of this surplus is continually loosing its momentum. The FX reserves are thus continually increasing.

When compared to for example the Danish economy than the biggest difference is in the current account. The Czech current account is consistently in a deficit while the Danish current account is in a significant surplus.

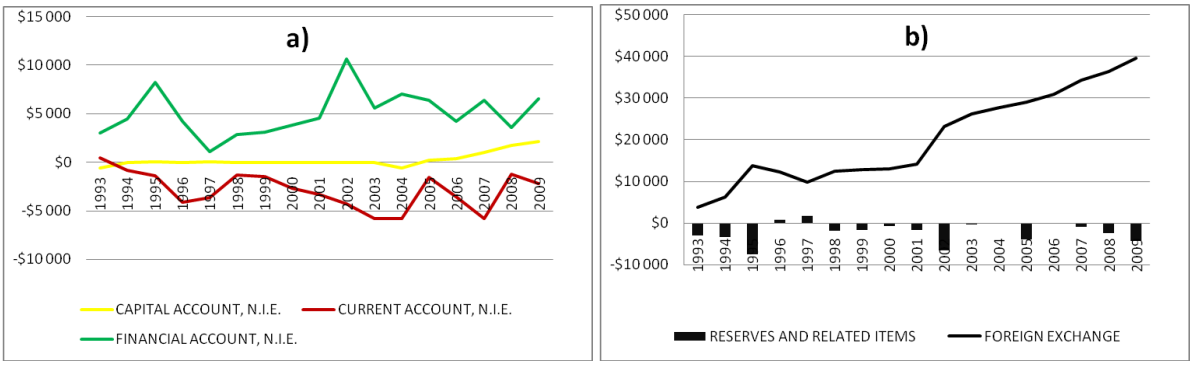


Figure 41a. Current account, capital account, financial account (Czech Republic) 1993-2009 (in millions)
Figure 41b. Foreign exchange reserves (Czech Republic) 1993-2009 (in millions)

Source: IMF Statistics (data compiled by author of the MT)

The only time at which the Czech monetary authorities used the FX reserves for interventions was in the 1997 currency crisis. The outcome of these interventions is still a matter of discussions. The clear thing is that regardless of these interventions the Czech currency had to abandon the fixed exchange rate system.

7.3.3. Current financial crisis (Exchange rate policy, NEER, REER)

The Czech Republic entered the episode of global financial crisis in relatively strong economic position. In 2007 the GDP growth was 6,1% the CPI 2,9% and unemployment was 6,55%. The value of Czech koruna has been appreciating until the middle of 2008 (see figure 42). This trend has been hurting the competitiveness of Czech exporters.

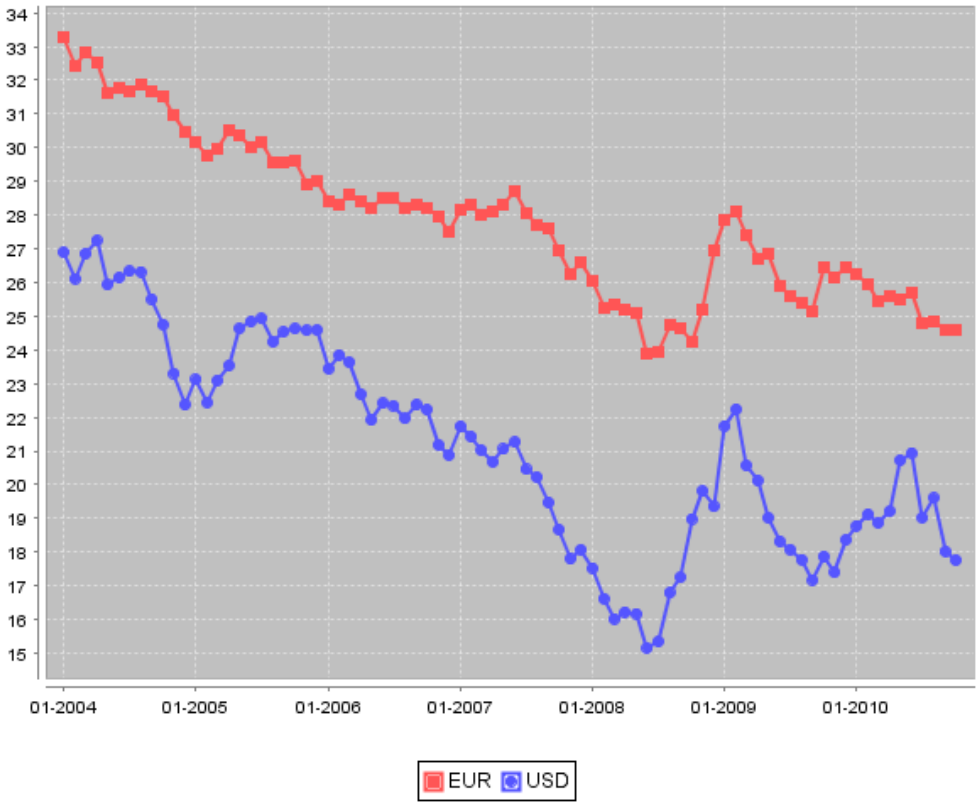


Figure 42. Exchange rates of EUR-CZK and USD-CZK (Czech Republic) 2004-2010

Source: The Czech National bank

Since 2007 the Czech currency has floated in relatively more volatile manner. The short term trends have been particularly strong since the middle of 2008. But because the currency is in a free floating regime the market and not the central bank's interventions determines its movement.

An interesting turnaround is visible on the figure 43a. In the beginning of 1990 the value of NEER has been significantly higher than the value of REER. This was because the rates of CPI had been relatively high. After the currency crisis the inflation levels came down significantly and since the 1999 the NEER and REER were moving virtually the same. Than in 2007 though the value of REER topped the value of NEER and since then it stood on average a 3,66 points above the value of NEER.

The figure 43c shows the most significant episode of development of monetary policy. This was the currency crisis in 1997 where the Czech Central bank decided to make significant interventions and also to drastically hike the short term interest rates. Shortly after this move on the short term interest rates the inflation spiked up to 13% only to decrease dramatically to 1% in 1999.

Since the beginning of the global financial crisis the interest rate policy of CNB has been consistent with the majority of European central banks. It has been continually raising the 2M repo rate until middle of 2008. Since then it slashed the 2M repo rate form 3,75% in 2008 to just 0,75% in 2010. The CPI in the same period moved virtually identical (see figure 43d)

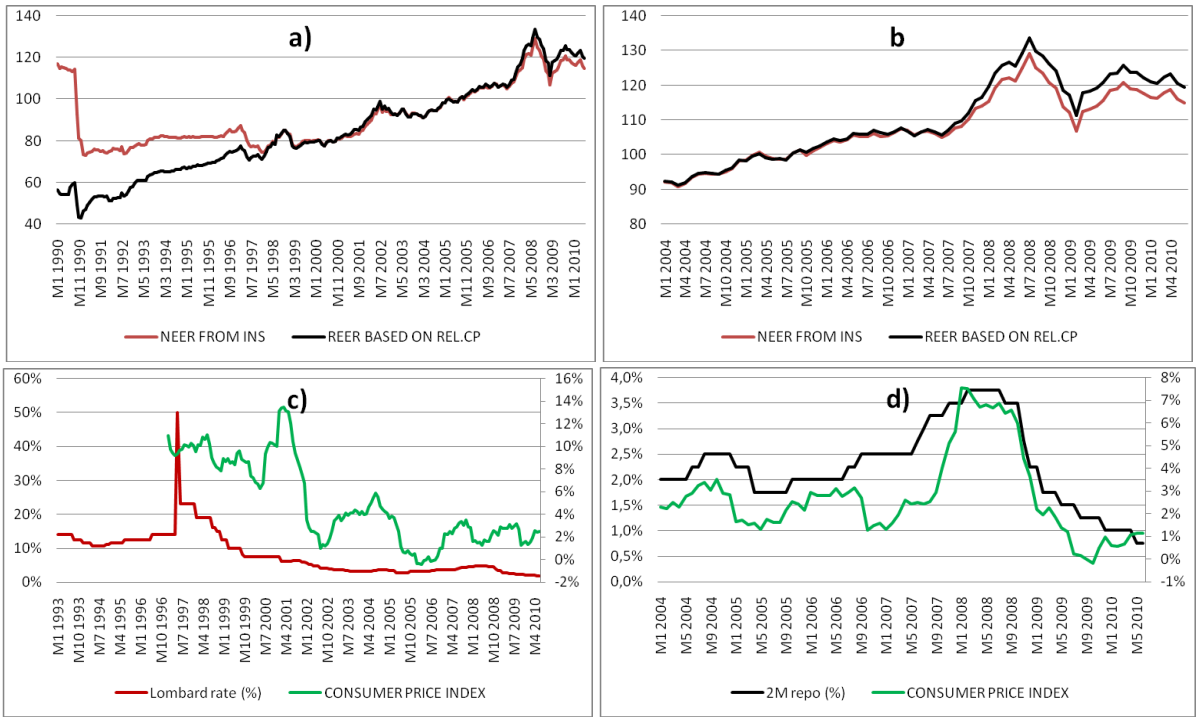


Figure 43a. REER, NEER (Czech Republic) 1990-2010 Index Numbers (2005=100)
Figure 43b. REER, NEER (Czech Republic) 2004-2010 Index Numbers (2005=100)
Figure 43c. Lombard rate (%), CPI Change (%) (Czech Republic) 1993-2010
Figure 43d. 2M repo rate (%), CPI Change (%) (Czech Republic) 2004-2010

Source: IMF Statistics (data compiled by author of the MT)

7.3.4. Review of fixed exchange rate usage in the Czech Republic (first MT hypothesis)[83]

The case of the Czech Republic is different from all the previous countries because it is the only country which abandoned the monetary policy regime of fixed exchange rate. It is necessary to emphasize that it has been forced to abandon this policy by massive flows of speculative capital.

[83] Monetary policies of fixed rate regimes may encourage a creation of a financial crisis.

In the beginning of the usage of monetary policy regime of fixed exchange rate in 1991 the maintenance of the value of currency had been without any problems.

"*This was because the flow of international capital had not been liberalized. The other reason was that the devaluation at the beginning of the economic reforms created a sufficiently "soft" atmosphere for adaptation of Czech companies and their competitiveness. The exchange rate could function as a nominal transformational anchor and CNB could without any problems meet its obligations of achieving stability of the currency. In the first years of transformation process there has been no pressure towards appreciation or depreciation. The balance-of-payments had been balanced and monetary policy could be focused according to the development of money supply."* [84]

The transformational process is unique and thus it is nearly impossible to make any general assumptions. In the case of this specific event in the history some authors speculate whether the Czech currency should have been revaluated in 1993.[85] The revaluation could have balance the trade balance and also decrease the inflow of foreign capital.

Over all it seems that the monetary policy regime of fixed exchange rate could have helped to encourage a creation of currency crisis. But as the CNB said in the beginning of the transformational process it also helped as a nominal transformational anchor.

7.3.5. Review of usage of FX reserves in the Czech Republic (second MT hypothesis)[86]

The amount of FX reserves which Czech National bank holds is according to Vladimír Tomšík who is a member of the board of CNB more than sufficient.[87] In comparison to for example Denmark CNB holds only about one half of the amount which the Danish central bank holds. On the other hand it is necessary to say that the amount of the Czech FX reserves equals about 20% of GDP. The ratio of FX reserves to GDP is comparable to the Danish one. CNB can cover with its FX reserves 3 to 4 months of imports. These ratios suggest according to Mr. Tomšík that the amount of FX reserves which the CNB holds is sufficient.

[84] Česká národní banka 1993-2003. *CNB*, [online], 2003, [ref. 2010-11-09], Accessible from WWW: < http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/verejnost/publikace/download/cnb_1993-2003_cz.pdf/>
[85] Mandel, M. - Tomšík V.: Monetární ekonomie v malé otevřené ekonomice. 1. vydání, Praha, Management Press, 2003. p.229
[86] Foreign exchange reserves may help a country to get out of a financial crisis.
[87] Podíl dolarů postupně klesá. *CNB*, [online], *7.1.2010*, [ref. 2010-11-09], Accessible from WWW: < http://www.cnb.cz/cs/verejnost/pro_media/clanky_rozhovory/media_2010/cl_10_100107c.html/>

In the current global financial crisis the CNB did not have to use its reserves on any direct interventions. The size of FX reserves though suggests that if any extraordinary conditions occur the CNB will have relatively plenty of reserves for possible interventions.

The fact though is that FX interventions in 1997 did not prove to be sufficient. The CNB had to abandon the monetary policy regime of fixed exchange rate even though it was fully committed to defending the currency before the actual currency crisis. From this point of view the reserves did not help to avoid the currency crisis.

Conclusion

The next statement can probably be marked as valid. "*The global financial crisis has started in 2007 and has affected the global economy.*" The fact is that many countries suffered from similar problems as a contraction (or reduction in the case of China) of GDP, a rise in unemployment and greater instability. But what is important and what should emanate from this MT is the importance of understanding that we cannot generalize and also that every economy has to primarily be analyzed as one specific and unique entity. It just does not seem to work to make general statements and expect that they will be universally true. Universally true is according to Daniel Defoe only death and taxes (as he noted in his 1726 book *The Political History of the Devil*). And even Defoe's statement is relative. So what are the findings of this MT?

The figure 44 shows a compressed version of all the findings that came out during the process of writing this MT. The main goal was to study the two hypotheses which I stated in the beginning of this MT. The first hypothesis says: "monetary policies of fixed rate regimes may encourage a creation of a financial crisis" and the second thesis says: "foreign exchange reserves may help a country to get out of a financial crisis".

	Impact of a Fixed ER*			Change in the IR		Change in FX reserves			
	CPI	GDP	unem.	2005-2008	2008-2009	2005-2008	2008-2009	1st hyp.*	2nd hyp.*
CH	+	?+	?+	34%	-29%	150%	57%	invalid	partly valid
VEN	+	?-	?-	12%	-6%	33%	-25%	inconclusive	partly valid
DK	+	?+	?+	100%	-75%	-16%	123%	invalid	inconclusive
CZ**	?+	?+	?+	56%	-71%	24%	15%	partly valid	inconclusive

***author's opinion**
****until 1997 currency crisis**

Figure 44. Summary of individual findings

According to findings of this MT it is clear that results are mixed and they differ from one country to another.

The first hypothesis seems to be invalid in China and Denmark, inconclusive in Venezuela and partly valid in the Czech Republic. The second hypothesis has even more ambiguous results. It is partly valid in China and Venezuela and inconclusive in both Denmark and the Czech Republic.

The case of China is unique in the sense that this country managed to have an average real GDP growth of 9,8% already since 1986. But what is important is the fact that in both Asian financial crisis and also in the current global financial crisis the monetary policy

regime of fixed exchange rates seemed to have fended of the major external negative effects. It is a policy that helps to stabilize the Chinese economy. Fixed exchange rate played a significant role in bringing down the rate of inflation. It also helped to boost the international competitiveness of China. The overall effect of fixed exchange rate in China's seems to be positive. It is though important not to forget the argument of Chinese currency being under valuated. The natural result of Chinese economic policies and its fixed exchange rate is the accumulation of FX reserves. Chinese FX reserves are the biggest in the world. The positive effect of a demonstration of power is obvious. There are though risks connected to 65% share of these reserves being denominated in the USD. Another problematic factor is the so called social cost of holding excess reserves. The second hypothesis can be though marked only as partly valid because it is not possible to clearly draw a connection between getting the economy out of the crisis and usage of the FX reserves.

Another country which is known for its preference to stability is Denmark. It seems that stability is one of the key elements of the Danish economy. Denmark for example preferred to keep the 2,25% bands in 1993 because its authorities feared of unwanted volatility and a loss of stability. The Danish currency is pegged to the euro and so far it seems that this relationship has produced mainly positive results especially in case of the CPI and GDP growth. Since the start of the global financial crisis Danish GDP contracted similarly as the rest of the Europe but according to REER it managed to regain its lost competitiveness very rapidly. Denmark is an opened and export oriented country and monetary policy regime of fixed exchange rate has helped significantly to adding stability and in connection with deep economic reforms it enabled to bring Denmark one of the top rated countries in the world. The first hypothesis thus seems to be invalid. Concerning the second hypothesis it is difficult to make a clear verdict. Danish authorities do not use FX reserves to any unorthodox policies to boost for example domestic demand nor do they intervene in the currency markets. The amount of FX reserves does though promote stability through owning enough gun powder should any major problem arise.

The case of Bolivarian Republic of Venezuela is also very unique. This is especially because of the current president Hugo Chavez. Central bank is effectively under control of his and the government so any independent monetary policy comes out of question. Venezuela is strongly dependent on the price of oil and its exports. Since 2005 the Venezuelan currency ceased to devaluate and its value has been fixed. This decision was made to cool down the inflation. In the same time though the monetary aggregate M1 expanded at unprecedented level so in the end the inflation did not decrease but actually increase. In the case of Venezuela it is very difficult to understand what the cause in development of specific macroeconomic variables is because monetary policy is under a very strong in influence of the government. The first hypothesis is inconclusive because on one hand the monetary policy regime of fixed exchange rate did help to cool down the inflation until 1997 but on the other hand the value of officially declared exchange rate mismatches

the reality. This causes a creation of black market and also number of economic distortions. The second hypothesis seems as partly valid because the government can utilize the large amount of FX reserves to defend the value of Venezuelan currency. Government also uses these reserves to fund its social programs. Problem is that these governmental programs probably cause in the longer term a rise of inflation.

The last case was the Czech Republic. The case the Czech Republic is again very special because of its transformational process and the fact that it underwent a currency crisis in which the monetary policy regime of fixed exchange rate had to be abandoned. The first hypothesis seems to be partly valid because the fixed exchange rate and especially the value of currency may have been a factor which helped in creation of a monetary crisis. The policy of fixed exchange rate on the other hand probably helped the economy in the early stage after the creation of the Czech Republic. It stabilized the economic environment and offered better conditions for Czech competitiveness. The value of currency and high interest rates caused a large inflow of foreign capital. This capital then played a significant role in the monetary crisis. Concerning the second hypothesis it not possible to clearly decide. On one side the CNB was able to defend the value of the currency with these reserves. But on the other side it lost a significant amount of FX reserves. Moreover these interventions did not succeed and at the end they did not avert the currency crisis.

All of these four countries have their unique stories and specific approaches to monetary policy. The usage of monetary policy tools and the overall handling of sometimes very dramatic market conditions differs these countries significantly. One thing is clear – monetary policy plays a powerful and important role in the economy of every state and thus has to be handled carefully. The preference of stability and continuity is one important thing that monetary authorities should thus definitely focus on.

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