

**Course Research Paper for EC521 “Development Economics”, Fall 2003**

**Prof. John R. Harris, Boston University**

# **Bulgaria’s Currency Crisis 1996/97 and the Currency Board Arrangement**

**by**

**Aleksandar Ivanov**

15<sup>th</sup> Dec. 2003, Boston University, Boston, MA

# Table of Contents

1. Introduction	3
2. The path to the crisis	
2.1. Prelude to a catastrophe	4
2.2. Bulgaria's path to the 1996-97 Financial Crisis	5
2.3. The Hit	7
3. From Theoretical Solutions To Policy Action	9
3.1 Mechanics of Inflation	9
3.2 Roots of Inflation - Empirical Evidence	11
3.3. Policy Recommendations	12
4. Actual Policy Measures Taken and Their Effects post 1997	15
5. Concluding Remarks	20
6. References	22
7. Appendix	
Appendix 1: SHAZAM Regression Output	23
Appendix 2: Selected Macroeconomic Indicators of the Bulgarian Economy	26

# 1. Introduction

In late 1996 till mid 1997 Bulgaria experienced a severe currency crisis with *near-hyperinflation*. The questions this short paper seeks to address is how the problem could develop in the first place, what solutions economic theory could offer to resolve it, what actions were taken by the Bulgarian government and the IFI (International Financial Institutions, i.e. World Bank, IMF, etc.) to deal with the situation, and what results these have achieved in light of the theoretic predictions.

While the 1996/97 crisis was a Twin Crisis (bank sector crisis followed by a currency crisis) I will attempt to narrow the analysis on the currency crisis. However, it will be necessary to keep an eye on the developments in the banking sector and the economy in order to fully appreciate the CBA (Currency Board Arrangement) and its implications for Bulgaria.

The depreciation of a country's currency is associated with huge losses of value of the domestic currency, which erodes the value of savings and loans. Per capita income falls in real terms due to the underlying fundamental economic imbalances and the lagging wages as in the Bulgarian case of fast inflation. Adjustment in such a situation is costly (output and distributional costs) and can be politically difficult to implement [CF95].

The stabilization of the financial sector and the currency can therefore only be a part of a comprehensive stabilization and restructuring program as in the case of Bulgaria were the Currency Board was introduced as part of an IMF stabilization program for the country in 1997.

BULGARIA - FAST FACTS	
Location	Eastern Europe, Balcans Region
Population	7,537,929 (July '03 est.)
GDP per capita (PPP \$)	6,600 (2002)
GDP real growth rate	4.8% (2002)
Political system	Parliamentary democracy since '90
Literacy rate	98.6%
Fertility rate	8.02 births/1000 pop.
Death rate	14.34 deaths/1000 pop.
Population growth rate	-1.09%
Net migration	-4.58 migrants/1000 pop.
Unemployment rate	18% (2002)
Labor force by occupation	agri. 26%, ind.31%, serv. 43%
distrib. of family income	Gini Index 26.4 (2002)
National currency	1 Lev = 100 stotinki

Table 1, Source: CIA World Fact Book 2003, BNB, NSI

## 2. The path to the crisis – Fate or Moral Hazard?

### 2.1 Prelude to a catastrophe

The story of the Bulgarian currency crisis follows the patterns of many others which have preceded it in history and, as one might think, could therefore be avoided. As we will see, as always in economics it all comes down to the actions of economic groups and agents, namely the government, powerful insider groups, political parties, and others. The general population is the group least responsible for the crisis but the most adversely affected one by what had happened. After a while distortions in corporations' and banks' balance sheets and national accounts always work their way down to the public...

After the collapse of the communist block in 1989/90 Bulgaria suffered heavy adjustment shocks, a fall in GDP and rising prices. The most important trading partners, namely the other former communist block countries, were themselves involved in severe domestic crises and therefore unable to support each other (see Figure 1). Moreover, Bulgaria's opening economy was not able to compete with the more advanced western economies. The price system was heavily distorted by 40 years of central price control and centrally planned economy.

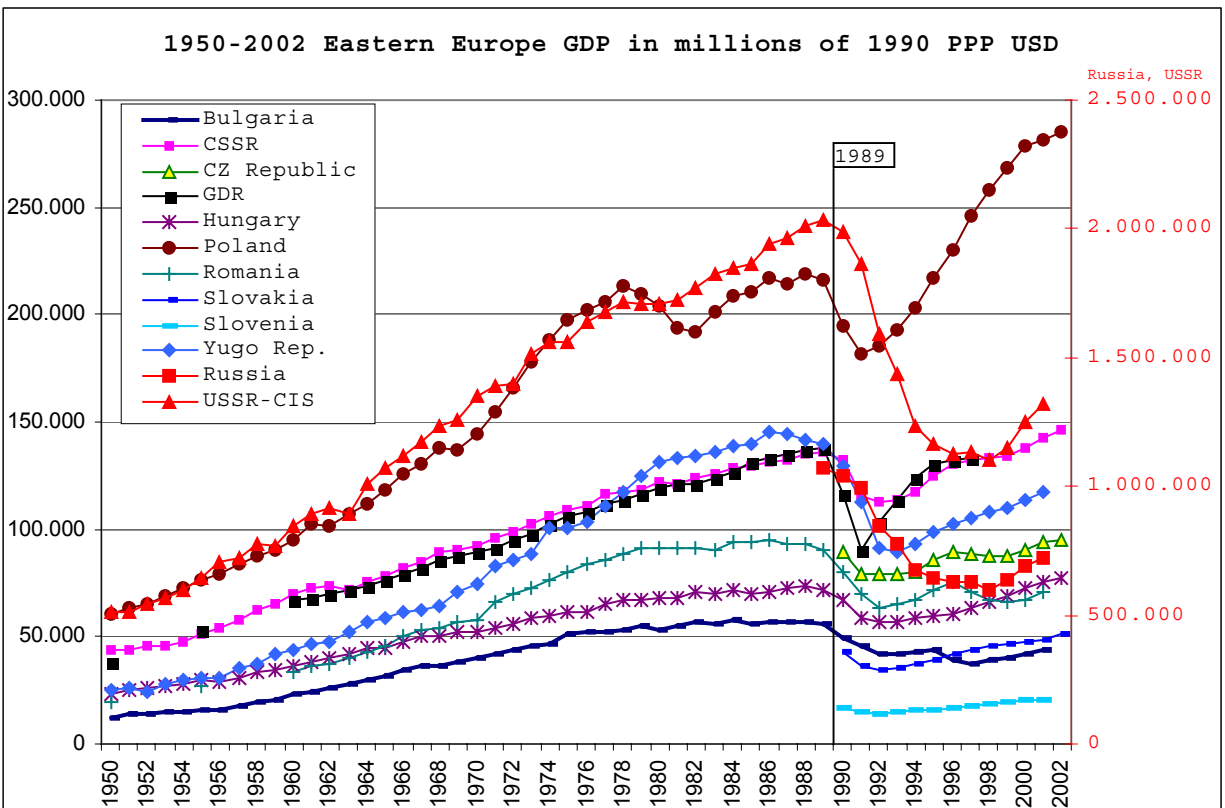


Figure 1, Source: IMF

## 2.2 Bulgaria's path to the 1996-97 Financial Crisis

This paper focuses on the currency crisis, but to understand its sources and in order to be able to derive some policy recommendation, one needs to oversee the whole picture.

As Bulgaria started opening its economy price controls were largely abandoned in February 1991 [MJ01] and prices rose sharply which lead to an inflation rate of 473% in 1991 (see Appendix 2).

Wages in the small private sector went down according to the lower domestic productivity and the corresponding market value of labor. However, wages in State Owned Enterprises (SOE) were kept above normal levels for a number of reasons, namely political fear of losing voters' support. In 1991 about 91% of the workforce, which also contains the biggest share of voters in the population, were employed in SOEs [NSI]. This figure declined to 55% in 1995, which is still too high and illustrates the inability of the government to initiate reform and retreat from the economic processes. A bad climate in the SOEs could have compromised the government's goals for re-election and this is any politician's biggest concern.

The wages at SOEs were too high relative to their then newly established market value, i.e. productivity. In addition to that price controls on important SOEs' products (electricity, communication, food) were only loosened gradually. These factors caused most SOE to be high loss-makers. In a normally functioning economy this would have led to some SOEs' bankruptcy and thus job losses for the economy.

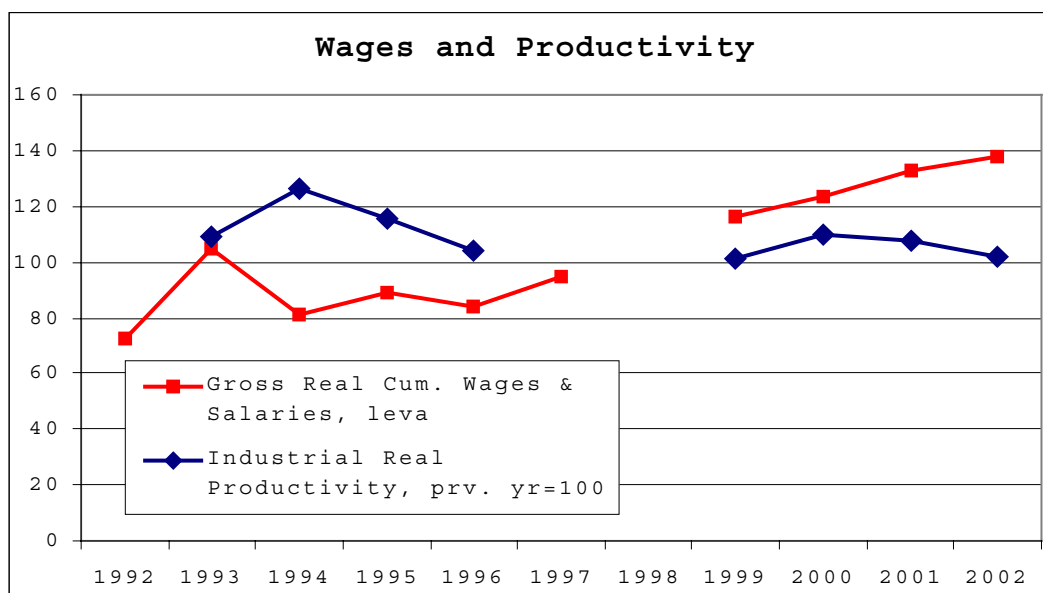


Figure 2, Source: BNB (Bulgarian National Bank), NSI (National Statistical Institute)

In fact, most SOEs were accumulating losses. A 1994 survey of non-financial SOEs in Bulgaria showed that those accounted for 87% of all non-financial enterprises' *operational profits* in Bulgaria. After-tax profits of non-financial SOE 's were (minus) 28530 mn leva, which corresponded to 92.7% of all after-tax profits. It is important to understand that those profits were *negative*, and have presumably been so in the periods before 1994 till the breakdown of the economy in end-1996 [AS96].

Still, those companies were able to continue to borrow from banks. They could borrow at interest rates, that didn't reflect their real risks or the fact that some of them were technically bankrupt (assets worth less than liabilities on the balance sheet).

One major reason for this was an implicit government guarantee for SOE, that was established by the actual behavior of the government, which via the Bulgarian National Bank (BNB) extended fresh credits to banks that borrowed to SOEs and to SOEs directly to pay off bank debt. Thus, the BNB had to use its Lombard window as well as its foreign currency reserves (mainly German marks and dollars) to support the exchange rate of the lev against the dollar. Appendix 2 shows the depletion of the BNB's reserves.

Secondly, the adverse lending practices in the banking sector with banks extending loans to companies owned by the banks' managers worsened the situation. Most of these banks were state-owned. The Bulgarian banking sector was characterized by a dominance of state owned banks and by micro-involvement of the government in the management of those banks. This is a perverted situation since it didn't allow the banks to make loan-decisions based on risk and credit rating [AS96]. Instead, powerful insider groups with close ties to the government (sometimes former government officials or relatives and friends of current government officials) were able to extract forex reserves of the BNB and real money from the economy as a whole and to divert it to own operations, SOEs they ran or to personal benefit. Private banks were engaged in dubious loan-making operations and acted without any responsibility for their depositors' funds.

In 1993 the government increased financing by government securities which by 1995 accounted for almost all domestic financing and about 20% of the total government revenues. This eased the pressure on the reserves of the BNB (see Appendix 2) but increased domestic government debt. The debt situation of the state became unsustainable as the country approached 1996 as Table 3 shows:

Table 3: Domestic Credit/GDP in %

Dec-95	Dec-96	Dec-97	Dec-98	Dec-99	Dec-2000
67.4	61.5	28.8	20.7	19	18.2

Source: [RL01]

### 2.3. The Hit

As noted before the economy contracted and grew only slightly in 1994/95 for the first time after the 1989 turn-over. In the run up to the 1996/97 crisis the Bulgarian economy posted large overall deficits as the government didn't initiate structural reforms to transform the country into a functioning market economy. Consequently, international funding whether in the form of credit or current account surpluses was scarce (see Appendix 3), and therefore deficit spending was largely financed via domestic credit and expansion of the money aggregates, which fueled inflation.

A 1996 survey showed that out of the 10 state banks which accounted for over 80% of the banking sector's assets (see Table 4), 9 had negative capital. More than 50% of the state banks' portfolios were *non-performing*. Half of the private banks were also technically bankrupt [GA99].

In end-1996 the economy slithered swiftly into disarray when 14 out of 36 banks failed and the government was forced to ask the BNB for assistance. About one-third of Bulgaria's banking system dissolved. Some 20% of the total bad debt in the defaulted banks was covered by the state through extended liquidity. In that year the forex reserves of the BNB declined by almost two thirds (Appendix 2, column for 1996) as the BNB tried to support the value of the inflated lev and cover bank losses. The breakdown should not have been a surprise to anyone after 6 years of bad-loan-accumulation.

Unfortunately, there was no comprehensive data available on pre-crisis loan portfolio quality (another sign of non-functioning institutions) but after the consolidation which followed the hit only 78% of commercial banks' loans were *not* classified as "special mention", i.e. of "standard" quality in December 1997 (see Table 5). This however confirms the supposition that there was a high number of bad loans before the 1996 burst and bail-out which is not surprising given the overall profit structure of the Bulgarian economy and its loss-accumulating SOEs.

Table 4 shows that state owned banks lost part of their assets and that foreign banks have injected some fresh capital into the economy.

**Table 4: Structure of Bulgarian Banking Assets (in%) shortly before and after the bank-failure shock.**

Period	State-owned Banks	Private Banks	Foreign Banks
October 1996	84.8	12.6	2.6
December 1997	67.1	14.8	18

Source: [VG01]

In 1996 and 1997 GDP growth was –10.1 and –6.9% respectively. Inflation reached 4-digit numbers from February till August 1997 (Fig. 3). The households had to bear the largest part of the currency's devaluation and GDP contraction as those losses worked their way through the banking sector and the government budget down to the consumer. To keep the money multiplier high and thus reduce the need for monetary base expansion<sup>1)</sup>, the BNB kept the BIR high to make holding of domestic currency in bank deposits more attractive (see Appendix 3 and Table 7). However, in 1996/97 inflation overtook any imaginable market rates and households' savings and pensions were devaluated (see Table 7). The dollar value of pensions fell below the daily poverty line value of the WorldBank of 4 US\$ [MJ01].

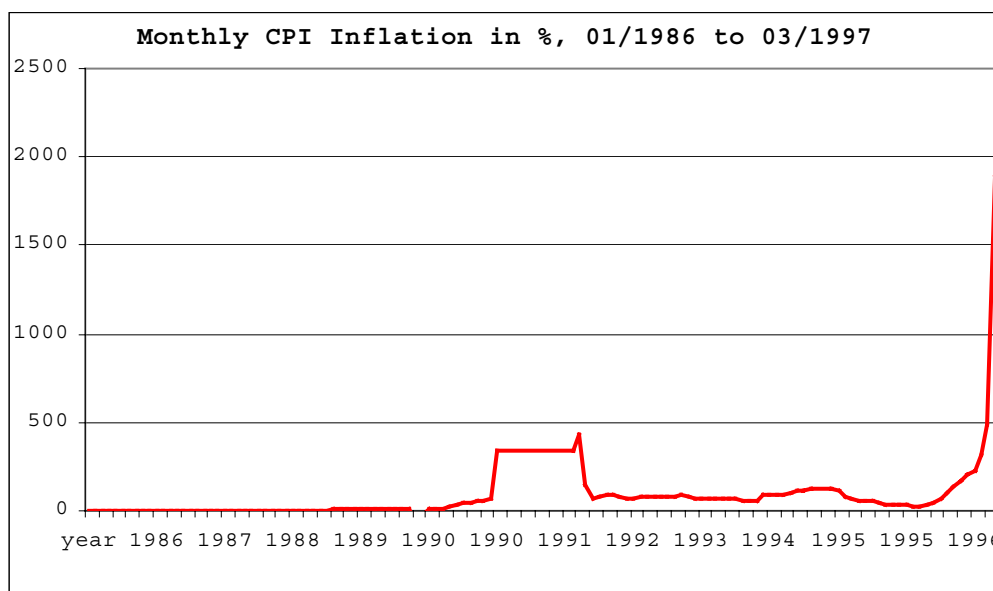


Figure 3, Source: BNB

For the sake of completeness and to illustrate the power of insider groups which favoured SOEs, it should be mentioned, that the credit supply to private enterprises was limited. Since those companies did not enjoy the implicit government insurance, banks were effectively denying credit to them: It was hard to obtain sound and verifiable financial data from these companies and banks were also lacking the expertise to thoroughly assess all information, thus setting interest rates to over 30% - unsustainable for any realistic growth rate.

As for the answer to the question stated in the heading of this chapter, I would like to refer the reader to chapter 5.

<sup>1)</sup>  $M = m \times MB$ , M=money aggregate, MB=monetary base,  $m = \frac{1+c}{r+e+c}$ , with c = currency to deposits ratio, e = excess reserves to deposits ratio, r = required reserve ratio.

### 3. From Theoretical Solutions To Policy Action

Without a doubt, Bulgaria was in need of a comprehensive structural adjustment program covering the public and the private sector.

*Fundamental problems to be addressed:*

- Privatization of loss-accumulating SOEs
- High Inflation eroding value of domestic currency
- Non-functioning institutions in the public and banking sector
- Problem of lost credibility as well as Moral Hazard in the banking sector and government
- Reduction of government deficit spending into it's SOEs (e.g. by privatization of SOEs)

Orthodox and heterodox IMF policies might be applicable here. Part of the stabilization effort should be to reduce inflation, which is our focus here.

#### 3.1 Mechanics of Inflation

The political and economic reasons behind the monetary expansion while GDP, productivity growth and BOP accounts (see Appendix 2) were lagging behind have been outlined in chapter 2.

The reduction of inflation can be analyzed in the context of a simple macroeconomic model by Dornbusch and Fischer found in [CF95]. The notation follows the one in [CF95].

Inflation is marked-up to wage inflation  $w$  and the rate of currency depreciation  $e$  as well as to adverse supply shocks  $\mu$  :

$$\Pi_t = \alpha w + (1 - \alpha)e + \mu \quad 0 < \alpha < 1 \quad (\text{c1})$$

An adaptive expectation-type Phillips curve sets wages according to inflation in the previous period  $\Pi_{t-1}$  and unemployment  $u$  :

$$w = \Pi_{t-1} - \lambda u \quad (\text{c2})$$

However, whether rising nominal wages "cause" inflation, or rather rising prices "cause" higher wages cannot be conclusively answered. The same critique applies to the determination of the rate of depreciation of the currency:

$$e = \beta\Pi_t + (1 - \beta)\Pi_{t-1} \quad 0 < \beta < 1 \quad (\text{c3})$$

Finally, by rearranging and replacement of (c1) – (c3), we arrive at the crucial equations for the relationships between inflation and unemployment:

$$\Pi_t = \Pi_{t-1} + \theta\mu - \alpha\lambda\theta u \quad (\text{c4})$$

inflation and real rates-of-change (i.e. rate-of-change differentials between inflation and wages and currency exchange-rate depreciation rates respectively):

$$\Pi_t = \Pi_{t-1} + \alpha(w - \Pi_{t-1}) + (1 - \alpha)(e - \Pi_{t-1}) + \mu \quad (\text{c5})$$

as well as unemployment as well as monetary and fiscal policies:

$$u = u_{t-1} - \gamma(m - \Pi_t) - \theta(e - \Pi_t) - \sigma f \quad (\text{c6})$$

with 
$$\theta = \frac{1}{1 - \beta(1 - \alpha)} . \quad (\text{c7})$$

In equation (c7)  $\theta > 1$  is always true for  $0 < \alpha < 1$  and  $0 < \beta < 1$ . The most important equation might be (c6) as it has some explanatory variables, that the government is able to control:  $m$  - the money supply rate and  $f$  - the fiscal expansion. To reduce inflation (c4) implies that an increase in unemployment is necessary. Thus, in (c6) it is necessary to reduce fiscal expansion and the money supply rate.

This will cause an increase in unemployment. According to (c2) for any  $\lambda > 0$  this will decrease wage inflation, which by (c1) and (c3) decreases inflation and the rate of currency depreciation  $e$ . Thus, by (c5) the inflation falls. This requires real wages to fall  $(w - \Pi_{t-1}) < 0$ .

Since all these are costly and politically unfavourable actions, the government has to have its hands tied so that one can rule out the possibility of printing money for financing new deficit spending.

Furthermore, (c5) tells us that the rate of currency depreciation has to fall below inflation in the previous period, which calls for some sort of credible currency peg.

### 3.2 Roots of Inflation - Empirical Evidence

To check on Bulgaria's determinants of inflation in the pre-peak-crisis period I examine a simple model

$$CPI_t = \beta_1 + \beta_2 M_t + \varepsilon_t \quad (8)$$

which suggests, that  $CPI_t$  (Consumer Prices Index in period t), and thus inflation of consumer prices, can statistically be explained by the money supply  $M_t$ . Here  $\{M_t\}$  is Bulgaria's monthly M3 and M1 respectively, from June 1995 to February 1997 were implementation of a currency peg was announced. Since there clearly is a structural break in 1997 with the introduction of a nominal anchor for the currency, I only show the relationship between  $\{M_t\}$  and CPI from 1995 to February 1997:

The regression confirms the expected relationship between the money aggregate M3<sup>2)</sup>, the CPI and thus inflation of consumer prices.

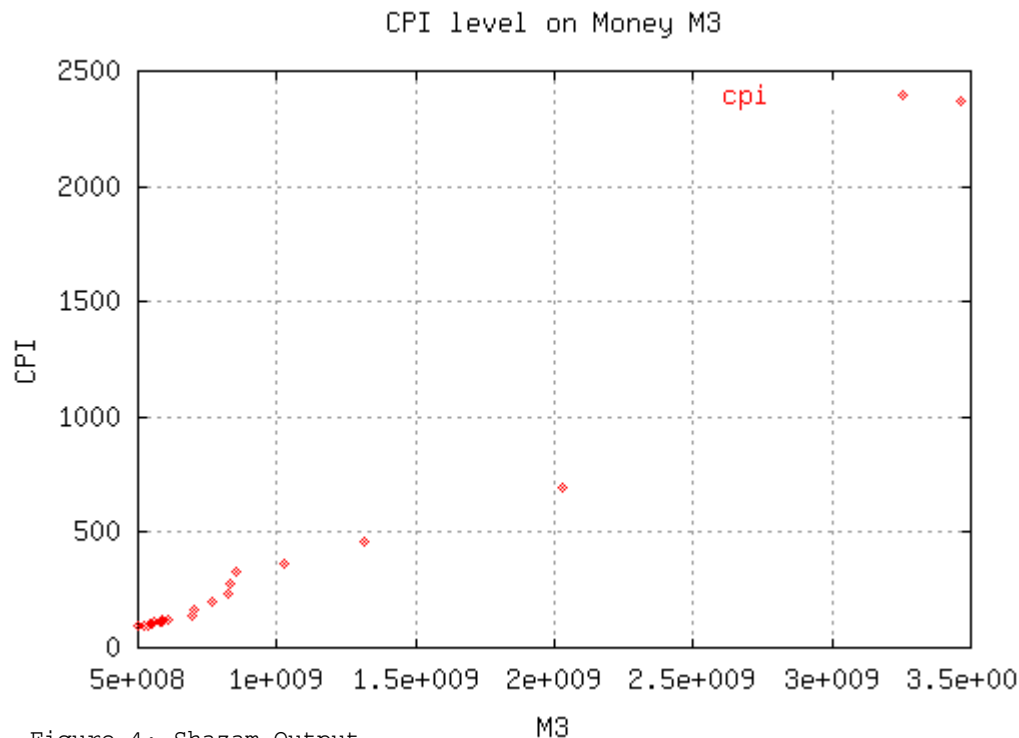


Figure 4: Shazam Output

The p-value, t-ratios of the coefficients and an  $R^2$ -adjusted of 0.9405 point to a good fit. The Durbin-Watson Test value and its p-value do not confirm the existence of autocorrelation (see Appendix 1 for complete results).

<sup>2)</sup> According to the definition of the *European Central Bank* monetary aggregates include:  
M1 = money outside banks and overnight deposits in BGN and foreign currency;  
M2 = M1 + Quasi money. Quasi money consists of deposits with agreed maturities up to 2 years (term deposits & special deposits)+deposits redeemable at notice up to 3 months (including savings deposits);  
M3 = M2 + debt securities issued up to 2 years + repos. Money market funds shares&units will be included in M3 following the creation of the institutional preconditions. Source: BNB

Another examination on the dependence of CPI on M1 shows a good fit with  $R^2$ -adjusted at 0.8586. But the Durbin-Watson Test also reveals significant positive autocorrelation in the residuals (see Appendix 1).

Clearly, the model in (8) is too simple but this is so in order to be able to concentrate on one policy variable. Common theory and the model in chapter 3.1 suggest that other explanatory variables could include past-period exchange rates, money aggregates and inflation. Also, the sample is too small since I could not obtain monthly  $M_x$  ( $x=\{0, 1, 2, 3\}$ ) time series data from the beginning of the 1990ies. In addition to that the large hikes in CPI at the end of the period's sample introduce some instability in the estimation. However, a more comprehensive Vector Autoregression analysis carried out by [TK00], confirms my results about the relation between M1, M3 and CPI.

After the analysis carried out in chapters 3.1 and 3.2, we are now ready to proceed to some policy recommendations.

### **3.3. Policy Recommendations**

I aim at proposing policy measures that would reduce inflation. Some attention will also be given to the mitigation of the fundamental problems of the Bulgarian economy.

The analysis in chapters 3.1. and 3.2. offered an insight into the direction and type of policy actions. The premier aim is therefore to stop government deficit spending along with a cut on monetary expansion. Simple commitments of the government to stop monetary expansion and deficit spending are not credible anymore after 7 years of governmental mismanagement. The Bulgarian people had lost their confidence in the lev and the banking sector after the devaluation of their deposits [RL01].

To reduce the rate of currency depreciation a pegged exchange-rate could help but since it is a discretionary policy credibility problems remain [KS94]. Likewise, classical Central Banking strategies for fighting inflation by control of the money supply or inflation targeting, are all subject to credibility constraints in the context of the time inconsistency problem. The economic and political dependency of the central bank on the government presents a problem here. The BNB was not credible or independent from government orders at all [BM03].

I would therefore propose the idea of a Currency Board Arrangement (CBA). A CBA is especially designed to address these time inconsistency and credibility problems in a central banking environment with a currency peg.

### *What is a Currency Board?*

A Currency Board (CB) is a form of Central Banking where changes in the money supply are tied to the Balance of Payments (BOP) and all notes and coins in circulation are completely backed by hard foreign currency reserves at the CB. The currency board guarantees unlimited convertibility of the domestic currency notes and coins with the reserve currency at an pre-announced non-changeable exchange rate. A CBA is a tool for mitigating or completely solving credibility problems since it deprives the government and the central bank of monetary tools. Economic agents can easily verify the credibility of the CB by checking daily exchange rates (e.g. online).

The simple and transparent rules and mechanics of the CBA aid the solution of the credibility problems: All currency is backed by forex, gold and other highly liquid reserves and no additional currency can be issued unless the reserves increase. If there is a deficit in the BOP the monetary base will shrink automatically until balance in the BOP is restored, i.e. the BOP deficit has been paid for with reserve currency obtained by the public from the currency board. BOP surpluses increase the monetary base by the same mechanics.

### *What reserve currency:*

Choosing a familiar currency would be of some help. Three international key currencies [HS94] were available at that time: The US dollar, the German mark and the Japanese yen. All currencies have a history of stability, with the mark having the best overall track record. A basket of reserve currencies does not seem advantageous to most potential currency boards. Some of the reasons being an increase in complexity and therefore possible conflicts with the aim of achieving credibility by transparency as well as foregoing the chance of eliminating exchange rate risk with at least one (key) currency [HS94].

Most important of all, the country of the reserve currency (RC) must ideally be experiencing symmetrical shocks to its economy as the CB country, since the CB country will give up all or most of its monetary instruments for mitigating such shocks [BM03]. Whatever monetary actions the RC country takes, will be immediately transmitted to the CB country (e.g. interest rates changes). Therefore, a symmetrical effect of shocks is desirable. Here Bulgaria's geographical vicinity and close trade relations with Western Europe would make the German mark an ideal currency. It already circulated as an unofficial currency in Eastern European countries and the former Soviet Union and used to be the dominant currency in the European market at that time. The German mark as a reserve currency would eliminate the exchange rate risk for most of Bulgaria's trade relations (largest partners are Russia, the EU and CEE countries<sup>3)</sup>).

---

<sup>3)</sup> EU = European Union, CEE = Central and Eastern European

### *The economy, the banking sector and LOLR:*

The introduction of a currency board would impose strict constraints to banks as there would be no central bank to serve as Lender of Last Resort (LOLR). This deprives the economy of tools for adjustment at the occurrence of (adverse) shocks. Bulgaria's banking sector was in distress and would probably not sustain these hard constraints. It is to be expected, that a number of insolvent SOEs will finally be able to default as neither banks nor the government continue their support as described in chapter 2. Beside the additional unemployment this would create in the economy, lending banks would suffer further defaults on their assets (see Table 5) and therefore it would be likely that additional banks could default in the adjustment process, which would compromise the stabilization attempts in the financial sector and the economy as a whole. To prevent such an adverse development, the CB should have some reserves in excess of the monetary base to stabilize those banks that should continue to operate, given their overall condition. Such reserves must in any case be *separate* from the reserves backing the monetary base, otherwise the CB would fall apart.

By taking over the role of the central bank as a Lender Of Last Resort (LOLR) to troubled banks, another loophole of monetary indiscipline can be closed without losing the ability to stabilize the economy and the highly volatile banking sector in the event of shocks. The LOLR function must of course also be designed to address the adverse lending practice. Banks which would continue to borrow to insolvent firms should not be given the right to receive LOLR support. Thus, such banks would default and go out of business and the currency board would have imposed more discipline throughout the economy.

### *Overview of predicted effects of a Currency Board Arrangement:*

The BNB will loose the ability to control the monetary base. The associated cut of the fiscal expansion  $f$  and the monetary expansion rate  $m$  will cause the real exchange rate to depreciate as deficit spending decreases and excess supply of non-tradeables would cause their prices to drop (price stickiness is not incorporated in the model of chapter 3.1). Under a fixed exchange rate a depreciation of the real exchange rate by a devaluation of the nominal exchange rate is not possible. Since most prices were deregulated by 1996 a currency peg should still be feasible with flexible prices in the process of adjustment (i.e.  $\Delta$  real exchange rate). Finally, inflation should converge to inflation in the reserve currency country.

The reduction of domestic government spending leads to a rise in exports and fall in imports as domestic demand for non-tradeables falls and by depreciation of the real exchange rate it becomes more profitable for domestic firms to sell abroad while prices for non-tradeables should drop. Furthermore, wages (in the non-traded sector) will fall and unemployment will continue to increase as the economy releases resources into the exports sector [GR96].

The CBA should restore credibility in the domestic currency and cause inflation to converge to the level of the anchor currency.

The hard constraints in the government budget together with a tight but transparent LOLR function of the currency board would both impose financial discipline throughout the economy and stabilize the banking sector.

*Adjustment will be costly, painful and politically difficult to implement.*<sup>4)</sup>

## 4. Actual Policy Measures Taken and Their Effects post 1997

The IMF brought a stabilization program under way, preparatory talks started in November 1996 [RL01]. To solve the immediate currency crisis the introduction of a currency board has been seen as the best solution. An announcement of an upcoming currency peg took place in February 1997. In the spring of 1997 a caretaker government took office and preparation for the introduction of a CB started [HS97]. The IMF has long not been favor of CBAs, instead it preferred the standard orthodox policies. As this crisis had a specific Agency aspect, the issue of credibility had to be addressed.

On June 30<sup>th</sup> 1997 the BNB prepared a closing balance and on July 1, 1997 the currency board started its operation [GA99]. Inflation had reached its peak in March 1997 and has since then declined to reach single digit values in 1998 (see Figure 5). Although the economic events that followed its introduction cannot all be attributed to the CBA, the CBA played an important role in the overall IMF-program. An outline of the comprehensive reforms undertaken since then can be found in [IM98].

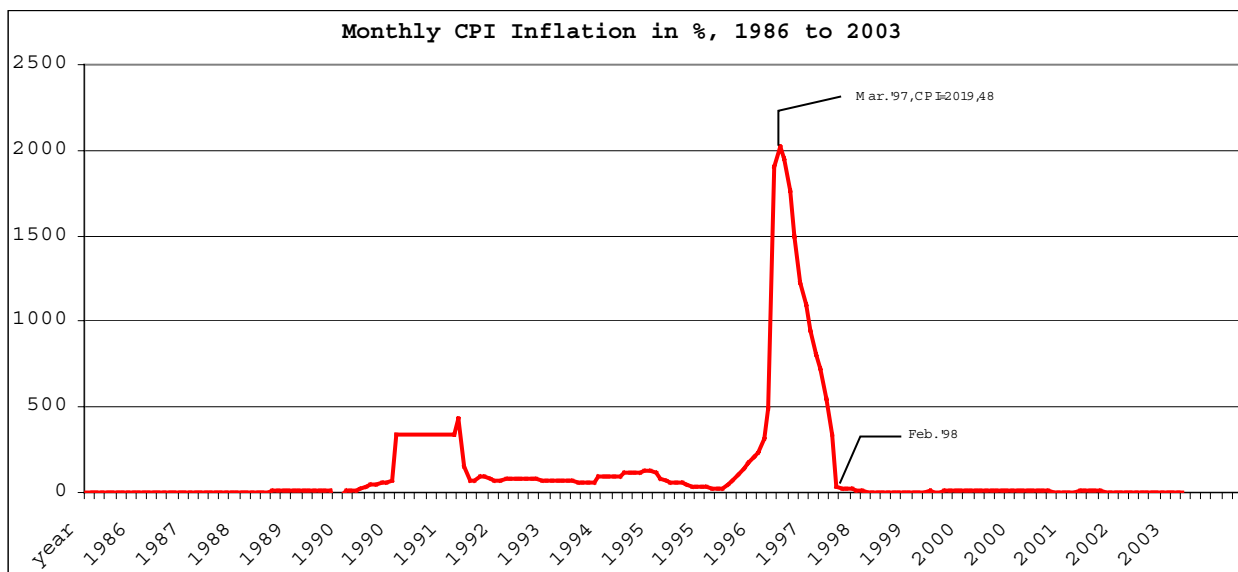


Figure 5, Source: BNB

<sup>4)</sup> author's opinion

### *Structure of the Bulgarian Currency Board:*

The CB obtained its *initial reserves* from the IMF and the remaining reserves of the BNB. The German Mark was chosen to be the anchor currency and the nominal exchange rate was fixed to 1 DM = 1000 leva. In June 1998 coverage of the monetary base by reserves reached 224% (see Figure 6).

The currency board consisted of an Issue Department, a Banking Department and a Banking Supervision Department. The Issue Department was the heart of the CB, holding the reserve assets and issuing notes and coins on its liabilities side. The Banking Department incorporated “the rest” of the BNB’s functions, namely LOLR, holding all other assets and claims of the central bank and acting as the fiscal agent for relations with the IMF. All of its liabilities were covered by additional foreign reserves held on accounts at the Issue Department separate from those covering the monetary base.

In addition to those three departments, the Issue Department held a Fiscal Reserve Account (FRA) for the government, which represents the budget available to the government at any given time. It was comprised of all government deposits at the BNB and the consolidation of 12 major extrabudgetary funds and was fully covered by additional foreign reserves. The IMF program governs, that the FRA maintains certain floor level, as to ensure that the government will be able to meet its debt obligations and avoid deficit spending.

The Fiscal Reserve Account and the deposits of the Banking Department with the Issue Department mean that the automatic adjustment mechanism linking the monetary base entirely to the reserves of the CB has been modified. Imbalances in the BOP can now be balanced by changes of the deposits of the government’s (FRA) or the reserves of the Banking Department on the liabilities side of the Issue Department. A major advantage of this design is the smoothing of the money supply and stabilization of aggregate demand.

Transparency was imposed as the CB publishes weekly balance sheets of its Issue Department online at [www.bnb.bg](http://www.bnb.bg).

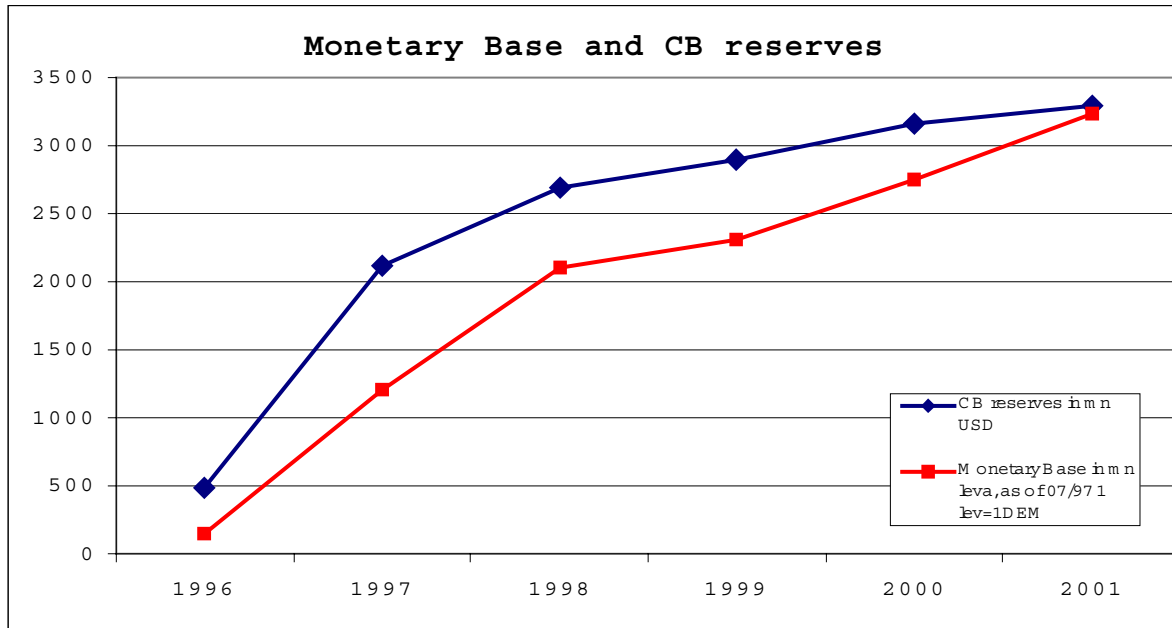


Figure 6, Source: BNB

### General Economic Development post-crisis

Figure 5 shows the resolution of the inflation crisis. Retail interest rates followed and came down to 5.8% at the end of 1998. The Base Interest Rate (BIR) reached single digit-levels and thus reduced the debt burden of the government and the public (Appendix 3).

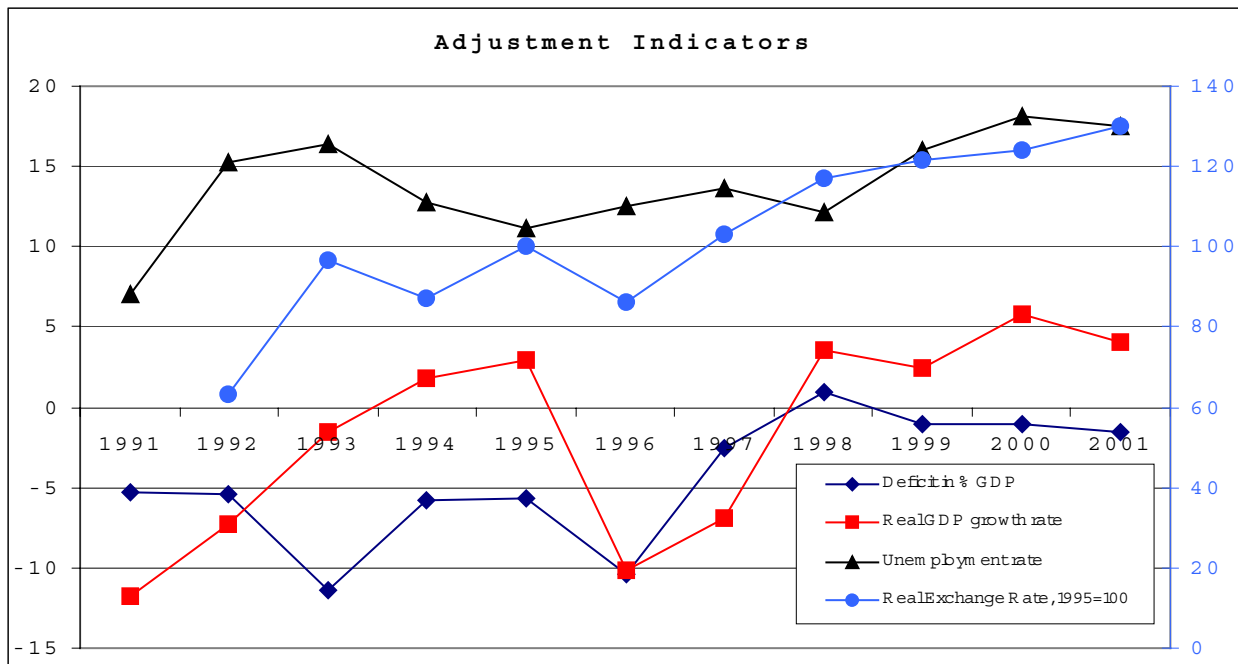


Figure 7, Source: BNB, IMF

The indicators in Figure 7 confirm that since 1997 Bulgaria has stabilized and settled on an adjustment path. In the course of adjustment unemployment rose (mainly industrial unemployment, Appendix 2, positions 4 & 6) and output began to grow slowly. Real exchange rate depreciation was modest compared to other developing countries in similar situations [RL01], which might be attributed to large privatization receipts and capital inflows (see Appendix 3, position 9.2) allowing the government to generate some demand for non-tradeables. The persisting current account deficits have so far been offset by these inflows of IMF funds and Foreign Direct Investment (FDI) in the form of privatization receipts.

Despite the high transparency and the strong standing of the CB, trust in banks never reached its pre-crisis level as the data in Table 7 and a rising Cash-to-Deposit-ratio show (see [MJ01]). This exacerbated the shortage in credit supply for the economy. But, the increase in the monetary base shows returning trust in the domestic currency (Figure 6).

The CBA introduced hard budget constraints to the government and the banking sector and prudential policies to commercial banks: The Banking Department now has to consult the IMF for any loan above 2 mln leva that would be extended to banks. To meet its debt service the BNB was allowed to on-lend IMF purchases to the government upon a decision of the BNB Management Board. No other credits in any form may be extended by the BNB to the government or any government agencies (BNB Law Article 45, [RL01]). Deficit spending could be eliminated almost completely by these measures (see Figure 7). Ergo, the government switched from domestic financing to borrowing from IFIs and funding from privatization revenues (representing part of the FDI), a source that will only last a few years (see Appendix 3 positions 11, 16 and 17). Seeking other forms of revenue the government also improved tax collection providing adequate revenues for its external obligations.

As predicted, the limited-LOLR availability combined with new prudential standards caused the loan portfolios of commercial banks to improve as Table 5 and Table 6 show. The Banking Supervision Department is responsible for monitoring banks' operations. The new discipline in the financial sector brought by the CBA, seems to have worked its way through to the real sector helping the productivity of the economy being somewhat less down-trended as in the pre-CBA period (see Figure 2).

**Table 5: Quality of Loan Portfolio of Commercial Banks**

	Dec-97	Dec-98	Dec-99	Dec-2000
Loans, mn BGN	3,806	5,945	5,042	7,395
Standard, %	78.8	86.6	86.2	91.8
Watch, %	3.7	3.6	4.4	2.8
Substandard, %	2.7	1.9	1.4	1.2
Doubtful, %	2.0	0.6	0.9	0.8
Loss, %	12.9	7.3	13.1	3.4

Source: [RL01]

**Table 6: Distribution of Loans Extended by Commercial Banks by Loan Category  
as of Oct. 31<sup>st</sup> 2003**

Category	Number	Balance Sheet		Off-balance Sheet	
		Exposure BGN	Percentage	Exposure BGN	Percentage
<b>Standard</b>	805.593	8.528.880.876,00	93,08%	1.718.942.150,00	82,98%
<b>Watch</b>	7.991	256.780.895,00	2,80%	43.774.301,00	2,11%
<b>Substandard</b>	2.392	76.004.597,00	0,83%	430.968,00	0,02%
<b>Doubtful</b>	864	72.115.087,00	0,79%	933.897,00	0,05%
<b>Loss</b>	17.432	229.427.508,00	2,50%	307.412.096,00	14,84%
<b>TOTAL</b>	<b>834.272</b>	<b>9.163.208.963,00</b>	<b>100,00%</b>	<b>2.071.493.412,00</b>	<b>100,00%</b>

Source: BNB

With the new regulations in place, the credit supply to the private sector remained limited (see Table 7), hampering growth.

**Table 7: Selected Banking Indicators, 1995 - 1999**

Indicator	1995	1996	1997	1998	1999
<b>Total Loans, % GDP</b>	47.8	115.3	22.2	20.7	22.5
<b>Private sector loans, % GDP</b>	21.6	37.0	13.1	12.8	7.2
<b>Total Assets, % GDP</b>	113.6	207.6	43.3	34.8	36.4

Source: BNB, [VG01]

## 5. Concluding Remarks

The case of Bulgaria teaches us of the importance of institutions and the consequences of adverse incentives generated by non-functioning institutions and thus the voters' lack of ability of monitoring and enforcement of socially desired behavior in all aspects of life. This clearly invited Moral Hazard into the financial system, i.e. lack of due diligence in lending and insider deal-making as well as micro-involvement of the government. The Economics of Institutions claim that the change of the system from central to market economy, deregulation, privatization and fiscal discipline are prerequisites for prosperity and individual freedom, but the success of an economy depends on its institutions [ZE03]. Bulgaria endured what many other transition economies in Eastern Europe had to endure: An economy being robbed by insiders and transfers of social reserves and endowment to private individuals.

The cases of many Central and Eastern European Countries' (CEE) fiscal and monetary problems after the exposure to the world of market economies are rooted in the lack of experience and trust in market forces, the government's inability to retreat from the economic processes, and of course the underlying fundamental distortions of the economies which caused the breakdown of the communist block in the first place.

Currency Boards have proved to be a good institutional way of dealing with inflation problems in countries with groggy institutions by imposing hard budget constraints. Along with structural measures and changes in regulation brought by a comprehensive IMF program they can be a crucial part of an IMF program's efforts, as in the case of Bulgaria, to stabilize the economy by forcing the banking sector to improve the quality of financial intermediation and the economy to adjust as banks and government have their hands effectively tied as far as insider deal-making and deficit spending are concerned, thus eliminating institutional loopholes.

The IMF and its sister-organization the WorldBank have long breathed the spirit of mainstream economics, but are starting to recognizing the importance of institutions nowadays. *"Institutions matter."* [ZE03]

### *Future Outlook for Bulgaria's Currency Board Arrangement:*

Bulgaria's currency board was a full success, while it has not yet been tested. The persisting current account deficits can pose a problem to the viability of the CBA as the main part of privatization receipts has already been realized and the IFIs (mainly IMF and WorldBank) contributions to the forex reserves in the form of BOP support or rescheduled repayments of debt are to be reduced in the coming years [RL01].

The feasibility and political viability of the CBA will therefore become more dependent on market outcomes and the economic performance of Bulgaria as it depends on its level of foreign exchange reserves. In order to be able to cope with sustained current account deficits and debt repayments Bulgaria must of course increase exports and FDI. Again, a necessary precondition for this is the economic and political stability as well as reduction of red-tape and corruption in the region and the country itself. The privatization of SOEs must be completed as to have productivity growing and the banking sector will have to start providing efficient credit to the economy while the new prudent regulations are being observed.

This will be the phase when a country starts gradually being released from the IFIs' structural adjustment support to the competition of the world markets as it is supposed to have used the period of support to foster reform and become a viable economy of its own. Depending on the speed of reform and adjustment Bulgaria might depend on IFI support for many years to come, though.

Bulgaria has declared to keep the CBA until a possible EU and EMU accession [RL01]. In the event of an EMU accession monetary control will be handed over to the central bank which would keep Bulgaria's financial sector in a similarly disciplined situation as it is now in.

## 6. References

- [AS96] Avramov, R. and Sgard, J. (1996) 'Bulgaria: From Enterprise Indiscipline to Financial Crisis' CEPII Working Paper No. 96-10
- [BM03] Berlemann, M. 'Theory and Policy of the Central Bank' Dept. of Economics and Business Management, Dresden University of Technology, 2003
- [CF95] Corbo, V. and Fischer, S. (1995) 'Structural Adjustment, Stabilization and Policy Reform: Domestic and International Finance' Handbook of Development Economics Vol. III, 1995: 2846-2917
- [FI13] Fisher, I. 'The purchasing power of money' New York, 1913
- [GA99] Gulde, A.-M. 'The Role of the Currency Board in Bulgaria's Stabilization' IMF Policy Discussion Paper 99/3
- [GR96] Gillis-Roemer 'Economics of Development', NY WW Norton, 1996
- [HS97] Hanke, S. 'New Currency Boards Come to the Balkans' World Bank, 1997
- [HS94] Hanke, S. and Schuler, K. 'Currency Boards in Developing Countries: A Handbook' International Center for Economic Growth Sector Study Number 9, 1994
- [IM98] Memorandum on Economic Policies of the Government of Bulgaria, <http://www.imf.org/external/np/loi/090998.htm>, 1998
- [JG88] Judge, George G. 'Introduction to the Theory and Practice of Econometrics', 1988
- [MJ01] Miller, J. B. 'The Bulgarian Currency Board' Comparative Economic Studies XLIII no. 1, 2001:53-74
- [RL01] Roussenova, L. 'The Bulgarian Currency Board: Specifics, Experience, and possible Challenges' European Institute, Sofia, Bulgaria, 2001
- [TK00] Tsalinski, T. and Kyle, S. 'Determinants of Inflation in the Bulgarian Economy' CAER II, Harvard Institute for International Development, 2000
- [VE] Vassileva, E. 'Currency Board and the Bulgarian Experience' Agency for Economic Analysis and Forecasting, Bulgarian Ministry of Finance
- [VG01] Vincelette, G. A. 'Bulgarian Banking Sector Development, Post 1989' Southeast European Politics Vol. 2, No. 1, 2001:4-23
- [BN03] Bulgarian National Bank, Statistics and Publications, [www.bnb.bg](http://www.bnb.bg), 2003
- [CI03] CIA World Fact Book 2003, Directorate of Intelligence Central Intelligence Agency, <http://www.cia.gov/cia/publications/>, 2003
- [WB03] World Bank 'Global Development Finance 2003', [worldbank.org](http://worldbank.org), 2003
- [IM03] International Monetary Fund 'International Financial Statistics', [www.imf.org](http://www.imf.org), 2003
- [NSI] Bulgarian National Statistical Institute, Annual Statistics
- [ZE03] Storn, Arne 'Totes Kapital' (Dead Capital), Die Zeit 49/2003, Germany

# 7.) Appendix

## Appendix 1:

### SHAZAM Output for OLS regression of CPI on M3 (in leva):

Data set: 1995:06 to 1997:02

M3	501506000	519048000	533104000	546805000	552064000	557510000	588429000	580286000	588418000	588017000	
CPI	97	98	99	104	106	109	112	117	118	120	
M3	610099000	696963000	702392000	766284000	821455000	832745000	854548000	1023820000	1317430000	2029200000	3464010000
CPI	123	138	164	202	237	281	328	362	464	691	2366

SHAZAM - Version 9.0 - JUN 2001 SYSTEM=WIN2000 PAR= 2000  
 |\_OLS CPI M3 / ANOVA PCOV TRATIO=TR

REQUIRED MEMORY IS PAR= 2 CURRENT PAR= 2000  
 OLS ESTIMATION  
 21 OBSERVATIONS DEPENDENT VARIABLE= CPI  
 ...NOTE..SAMPLE RANGE SET TO: 1, 21

**R-SQUARE = 0.9435 R-SQUARE ADJUSTED = 0.9405**  
 VARIANCE OF THE ESTIMATE-SIGMA\*\*2 = 14600.  
 STANDARD ERROR OF THE ESTIMATE-SIGMA = 120.83  
 SUM OF SQUARED ERRORS-SSE= 0.27741E+06  
 MEAN OF DEPENDENT VARIABLE = 306.48  
 LOG OF THE LIKELIHOOD FUNCTION = -129.429

ANALYSIS OF VARIANCE - FROM MEAN				
	SS	DF	MS	F
REGRESSION	0.46338E+07	1.	0.46338E+07	317.376
ERROR	0.27741E+06	19.	14600.	P-VALUE
TOTAL	0.49112E+07	20.	0.24556E+06	0.000

ANALYSIS OF VARIANCE - FROM ZERO				
	SS	DF	MS	F
REGRESSION	0.66063E+07	2.	0.33031E+07	226.237
ERROR	0.27741E+06	19.	14600.	P-VALUE
TOTAL	0.68837E+07	21.	0.32779E+06	0.000

VARIABLE NAME	ESTIMATED COEFFICIENT	STANDARD ERROR	T-RATIO 19 DF	P-VALUE	PARTIAL CORR.	STANDARDIZED COEFFICIENT	ELASTICITY AT MEANS
M3	0.70111E-06	0.39355E-07	17.815	0.0000	0.9713	0.97135	2.0343
CONSTANT	-316.98	43.818	-7.2342	0.0000	-0.8565	0.0000	-1.0343

VARIANCE-COVARIANCE MATRIX OF COEFFICIENTS  
 M3 0.15488E-14  
 CONSTANT -0.13773E-05 1920.0  
 M3 CONSTANT

\*\*Comment by author: NO AR(1) Auto-Correlation according to DW-Test\*\*  
**DURBIN-WATSON = 1.9661** VON NEUMANN RATIO = 2.0644 RHO = -0.13908  
 RESIDUAL SUM = 0.45475E-12 RESIDUAL VARIANCE = 14600.  
 SUM OF ABSOLUTE ERRORS= 1363.2  
 R-SQUARE BETWEEN OBSERVED AND PREDICTED = 0.9435  
 RUNS TEST: 5 RUNS, 14 POS, 0 ZERO, 7 NEG NORMAL STATISTIC = -2.7045  
 COEFFICIENT OF SKEWNESS = -1.9334 WITH STANDARD DEVIATION OF 0.5012  
 COEFFICIENT OF EXCESS KURTOSIS = 8.5046 WITH STANDARD DEVIATION OF 0.9719

JARQUE-BERA NORMALITY TEST- CHI-SQUARE(2 DF)= 46.3909 P-VALUE= 0.000

|\_DISTRIB TR /TYPE=T DF=19  
 T DISTRIBUTION DF= 19.000

VARIANCE= 1.1176 H= 1.0000

		DATA	PDF	CDF	1-CDF
TR					
ROW	1	17.815	0.13016E-12	1.0000	0.12901E-12
ROW	2	-7.2342	0.70765E-06	0.36119E-06	1.0000

\*\*comment by author: Statistics for dependent and explanatory variables\*\*

_stat CPI M3							
NAME	N	MEAN	ST. DEV	VARIANCE	MINIMUM	MAXIMUM	COEF.OF.VARIATION
CPI	21	306.48	495.54	0.24556E+06	97.000	2366.0	1.6169
M3	21	0.88924E+09	0.684E09	0.47133E+18	0.501E09	0.3464E10	0.77205

## SHAZAM Output for OLS regression of CPI on M1 (in mn leva):

Data set: 1995:06 to 1997:02

M1	295,2	320,4	333,2	345,1	355	355,6	416,2	361,3	367,9	358,9
CPI	97,73	98,75	99,4	104,13	106,87	109,69	112,75	117,34	118,2	120,3
M1	373,2	399,1	431,6	494	546,4	549,2	560,9	671	897,5	917,2 1483,1
CPI	123,98	138,52	164,4	202,13	237,69	281,58	328,97	362,13	464,05	691,13 2366,1

SHAZAM - Version 9.0 - JUN 2001 SYSTEM=WIN2000 PAR= 2000

|\_OLS CPI M1 / ANOVA PCOV TRATIO=TR RSTAT DWPVALUE

REQUIRED MEMORY IS PAR= 5 CURRENT PAR= 2000

OLS ESTIMATION

21 OBSERVATIONS DEPENDENT VARIABLE= CPI

...NOTE..SAMPLE RANGE SET TO: 1, 21

**DURBIN-WATSON STATISTIC = 1.10001**

DURBIN-WATSON POSITIVE AUTOCORRELATION TEST P-VALUE = 0.007053

NEGATIVE AUTOCORRELATION TEST P-VALUE = 0.992947

**R-SQUARE = 0.8655 R-SQUARE ADJUSTED = 0.8585**

VARIANCE OF THE ESTIMATE-SIGMA\*\*2 = 34754.

STANDARD ERROR OF THE ESTIMATE-SIGMA = 186.42

SUM OF SQUARED ERRORS-SSE= 0.66033E+06

MEAN OF DEPENDENT VARIABLE = 306.48

LOG OF THE LIKELIHOOD FUNCTION = -138.535

ANALYSIS OF VARIANCE - FROM MEAN				
	SS	DF	MS	F
REGRESSION	0.42509E+07	1.	0.42509E+07	122.312
ERROR	0.66033E+06	19.	34754.	<b>P-VALUE</b>
TOTAL	0.49112E+07	20.	0.24556E+06	<b>0.000</b>

ANALYSIS OF VARIANCE - FROM ZERO				
	SS	DF	MS	F
REGRESSION	0.62233E+07	2.	0.31117E+07	89.534
ERROR	0.66033E+06	19.	34754.	<b>P-VALUE</b>
TOTAL	0.68837E+07	21.	0.32779E+06	<b>0.000</b>

VARIABLE	ESTIMATED	STANDARD	T-RATIO	PARTIAL	STANDARDIZED	ELASTICITY
NAME	COEFFICIENT	ERROR	19 DF	P-VALUE	CORR. COEFFICIENT	AT MEANS
M1	1.6331	0.1477	11.06	0.000	0.930	0.9303 2.7468
CONSTANT	-535.35	86.31	-6.203	0.000-0.818	0.0000	-1.7468

VARIANCE-COVARIANCE MATRIX OF COEFFICIENTS

M1 0.21805E-01

CONSTANT -11.240 7448.9

M1 CONSTANT

**DURBIN-WATSON = 1.1000** VON NEUMANN RATIO = 1.1550 RHO = 0.39695

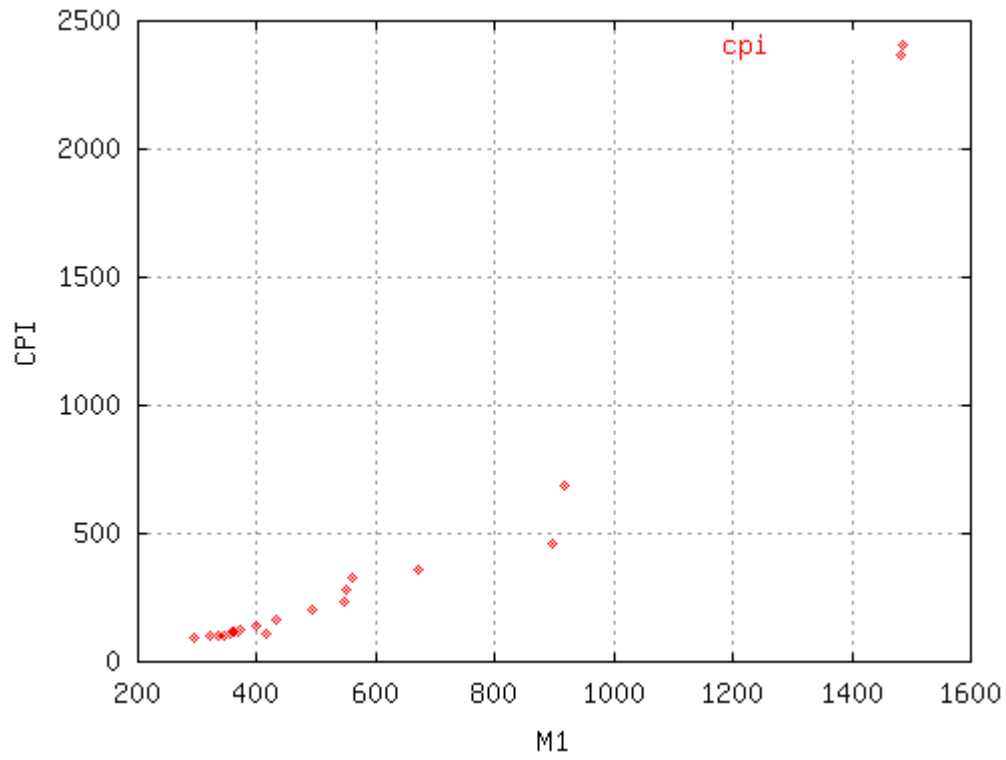
RESIDUAL SUM = -0.28422E-12 RESIDUAL VARIANCE = 34754.

SUM OF ABSOLUTE ERRORS= 2583.8  
R-SQUARE BETWEEN OBSERVED AND PREDICTED = 0.8655

\*\*comment by author: Statistics for dependent and explanatory variables follow here\*\*

NAME	N	MEAN	ST. DEV	VARIANCE	MINIMUM	MAXIMUM
CPI	21	306.48	495.54	0.24556E+06	97.000	2366.0
M1	21	515.48	282.30	79693.	295.00	1483.0

Shazam Output:



## Appendix 2: Selected Macroeconomic Indicators of the Bulgarian Economy

Indicator \ Year <sup>*)</sup>	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1. GDP, mn (1990 PPP US \$)	44.778,2	42.277	41.674	42.441	43.646	39.538	37.348	38.827	39.703	41.838	43.536
2. GDP, mn (nominal US \$)	N/A <sup>4)</sup>	8607	10834	9706	13108	9901	10365	12737	12955	12600	13599
3. Real GDP Growth Rate, %	-11,7	-7,3	-1,5	1,8	2,9	-10,1	-6,9	3,5	2,4	5,8	4
4. Industrial Production Growth Rate, %		-18,4	-9,8	10,6	4,5	5,1	-10	-12,7	-11,4	4,3	8,4
5. Annual Inflation Rate, %	473,9	79,4	63,9	121,9	32,9	310,8	578,6	1,0	6,2	11,4	4,8
6. Annual Unemployment Rate, %	7	15,3	16,4	12,8	11,1	12,5	13,7	12,2	16	18,1	17,5
7. Consolidated State Budget Revenues, leva=BGN bn		0,1	0,1	0,2	0,3	0,6	5,6	8,9	9,7	11,1	11,8
8. Consolidated State Budget Expenditures, BGN bn		0,1	0,2	0,2	0,4	0,8	6,1	8,7	9,9	11,3	12,1
9.1 Balance of Current Account, USD mln	-77	-377,5	-1081,2	-31,9	-198	163,7	1046,3	-61,4	-651,7	-701,6	-877,9
9.2 [Exports - Imports (c.i.f.)], in USD mln	-663.62	-1901.05	-2161.32	-1319.32	-248.85	-110.7	434	-894.32	-1494.9	-1601.8	-2120.3
9.3 Balance of Financial Account <sup>1)</sup> , USD mln	-428.6	613.4	759.2	1.0	360.0	-699.3	264.7	71.7	733.1	781.3	662.8
9.4 Overall BOP Balance <sup>2)</sup> , USD mln	-273.9	270.0	-322.1	40.8	478.5	-724.2	1202.8	-94.8	95.6	137.3	373.1
9.5.1 Net Use of IMF Credit, USD mln	400.0	196.2	42.8	262.4	-246.0	-107.9	396.9	129.4	162.1	135.9	-168.5
9.5.2 Exceptional Financing <sup>3)</sup> , USD mln	192.5	172.2	32.0	37.8	0.0	80.9	40.4	426.4	269.5	136.0	70.5
10. Balance of Current Account, in % GDP (pos. 2)	-5,4	-7,8	-9,5	-9,4	-3,1	-3,5	-2,7	-1,7	-3,5	-4,1	-4,6
11. General Government Balance in % of GDP	-5.3	-5.4	-11.4	-5.8	-5.7	-10.4	-2.5	1.0	-1.0	-1.0	-1.5
12. Exchange Rate of 1 USD, end of year		23,3	27,7	54,2	67,2	175,8	1675,5	1,76	1,9469	2,1019	2,2193
13. Average Monthly Gross Salary, USD		87,7	116,9	91,5	113,1	79,4	76,3	106,5	109,4	112,1	115,9
14. Base Interest Rate (end of year), %		41	52	72	34	180	6,65	5,08	4,46	4,63	4,65
15. External Debt Stock (end of year), USD bn	12,2	13,8	13,8	11,3	10,1	9,6	9,8	10,3	10,2	10,4	9,9
16. Interest Payments on Foreign Debt in % of GDP	1,9	2,9	2,3	2	4,5						
17. Interest Payments on Domestic Debt in % of GDP	6	4,8	8,3	11,8	11,3						
18. BNB (till '97) and CB Forex Reserves, USD mn		902,2	655,2	1001,8	1236,4	483,6	2111,5	2684,7	2892,1	3154,9	3290,8

<sup>\*)</sup> Monetary time series data for Bulgaria display a structural break in 1997 as the currency peg and CB were introduced in that year. The disturbances created by this break cause also some real data to have gaps or show abnormal behavior around the year 1997.

<sup>1)</sup> A minus sign denotes a capital outflow.

<sup>2)</sup> The balance of the capital account was zero or close to zero throughout the 1990ies. In 1997 receipts from some privatization deals and increased exports, due to the high inflation and the associated price drop from a foreign perspective, have caused the BOP, Current Account Balance and the Budget Surplus to be positive for that year.

<sup>3)</sup> Including BOP Support, Deferred/rescheduled payments and payments in arrears.

<sup>4)</sup> N/A indicates that no data is available from the official sources. An empty field indicates that the author was unable to obtain that data.

Source: IMF, BNB, author's calculations