

2. THE BULGARIAN CRISIS IN PERSPECTIVE: FINANCIAL CRISES IN OTHER TRANSITION ECONOMIES AND EXISTING ANALYSES OF THE CRISIS

In Chapter 1, we tried to assess the economic crisis in Bulgaria with standard models of financial crises; and reached the conclusion that the crisis was atypical in many respects. In this chapter, we first look at the evidence from comparable transitioning economies (Section 2.1) and then provide an overview of existing analyses of the Bulgarian crisis (Section 2.2). The chapter confirms i) the singularity of the Bulgarian experience, and ii) the difficulties associated with understanding and modeling the crisis.

2.1 Banking Problems in Transition Economies

Virtually all transition economies experienced some banking problems during the nineties; some countries experiencing more than one crisis episode over the period. As suggested by **Tang, Zoli, and Klytchnikova (2001)**, these crises can be classified within two broad categories: i) solvency problems in state-owned banks resulting from non-performing loans inherited from the socialist regime; and ii) solvency problems in both state-owned and private banks, resulting from “unsound banking practices” (such as connected lending or excessive risk taking) during the

transition years. These solvency problems often led to liquidity problems and bank runs, in particular in the second half of the decade.

The length and magnitude of the crises varied greatly across countries, as measured by the share of non-performing loans in total loans, or by the occurrence and severity of bank runs.³⁶ The share of non-performing loans in banks portfolio was relatively large for all twelve countries. The authors explain: “*The incidence of such loans was larger than for many non-transition countries that went through banking crises*” (page 4).³⁷ Significant bank runs were reported in Bulgaria (in 1995 and 1996-97), the Czech Republic (1996-97), Hungary (1997), Macedonia (1994), Estonia (1994), Latvia (1995), Lithuania (1995-96), Georgia (1995-97) and Kazakhstan (1996). The runs affected the entire banking system, or were limited to one or two banks, as in Bulgaria in 1995, Hungary in 1997, Estonia in 1994, or Georgia in 1995-97.³⁸

Banking crises in transition economies were caused by a variety of factors. Many of these factors are described extensively for Bulgaria in Sections 2.3 and 3.2.1 of this document. They include:

- Large amounts of bad debt inherited from the pre-transition era;

³⁶ See Table A-14 in the Appendices

³⁷ For instance, before the start of a banking crisis, the ratio of bad loans to total loans was 9 percent in Argentina (end-1980) or 11 percent in Mexico (September 1994), versus 15 percent in Bulgaria (1996) or 37 percent in the Czech Republic (1994).

³⁸ Tang, Zoli, and Klytchnikova (2001), pages 4 and 8

- Adverse macroeconomic conditions, including severe output contraction associated with the transition process³⁹ and exacerbated by the dissolution of the Council for Mutual Economic Assistance (CMEA);
- The impact of macroeconomic stabilization policies (and monetary tightening) on real interest rates and the ability of borrowers to service their debt;
- Deficiencies in bank supervision and banking laws, with limited legal framework for dealing with loan collection or bankruptcy proceedings;
- Poor internal governance and management misconduct, leading to inadequate disclosure, insider lending, corruption practices, and fraud; and
- Moral hazard problems created by repetitive (and unconditional) banks bailout programs, and by the widespread belief that the government would always provide its support as it did in the past.

Overall, as stressed by **Enoch, Gulde, and Hardy (2002)**, besides the solvency problems inherited from the old regime, the factors that contributed to banking difficulties in transition economies were similar to those found elsewhere. To use the words of **Caprio and Klingebiel (1996)**, they resulted from a combination of “*bad luck, bad policy, and bad banking*” (see Section 1.2).

2.2 Evidence of “Twin Crises” in Transition Economies

Tang et al. (2001) find no obvious correlation between exchange rate regimes and the occurrence of crisis in the banking sector. Among the twelve countries surveyed by the authors, Bulgaria is the only one that experienced a currency crisis “in conjunction with” its banking crisis (page 12). What distinguishes Bulgaria

³⁹ See Blanchard (1996)

from the other economies in the sample? At least two key characteristics: i) the magnitude and distribution of the fiscal and quasi-fiscal costs associated with the banking crises; and ii) the level of foreign exchange reserves *relative to* measures of domestic liquidity. This is explained in the sections below.

2.2.1 Magnitude and Distribution of Banking Crisis Resolution Costs

The costs of banking crises are usually distributed amongst depositors, bank shareholders, the government budget, and the central bank. The fiscal and quasi-fiscal costs of banking crises typically include the cost of bank restructuring to the government (e.g., recapitalization bonds and associated interest payments, or banks' and enterprises' liabilities assumed directly by the government) and to the central bank (e.g., losses on credit extended to troubled banks); and the cost of depositor compensation, borne by the government budget through various forms of deposit insurance.

The total fiscal and quasi-fiscal costs associated with the banking crises documented in Section 2.1 are summarized in Table A-16 in the Appendices. The differences in fiscal costs reported in the table are significant: total costs range from 0.1 percent of GDP for Georgia, to a whopping 41.6 percent of GDP for Bulgaria (the 12-country average was about 14 percent). They can be attributed to at least three factors: differences in crisis severity, differences in bank restructuring strategies, and differences in the extent of loss sharing with depositors and bank shareholders. As explained by Tang et al. (2001), in countries from Central and Eastern Europe, authorities engaged massively in bank recapitalization (with government bonds); while authorities in the Commonwealth of Independent States (CIS) favored recapitalization by private shareholders, and if this proved impossible, immediate bank closure and

liquidation with minimal compensation for depositors and existing bank shareholders.⁴⁰ The Baltics pursued a mixed strategy, with some capital injection from the government. As can be seen in Table A-16, the softer stance adopted by countries from Central and Eastern Europe resulted in much larger fiscal costs.

In Bulgaria, *all three factors* contributed to very large fiscal costs: i) Bulgaria experienced one of the deepest solvency crises (as evidenced by the share of non-performing loans inherited from the socialist system); ii) it adopted a bank restructuring program based on limited bank closure, large capital injections (through the ZUNK bond program), sustained central bank credit, and iii) relatively limited loss-sharing with depositors (at least prior to the burst of inflation in late 1996 - early 1997). These three points are documented at length in Chapter 3.

Furthermore, the full cost of bank failures might have been too large for the Bulgarian government to assume. This is the thesis put forth by **Enoch, Gulde and Hardy (2002)**. The fiscal burden associated with the banking crisis was so large that money printing became inevitable: *“In the depth of the crisis, it would have been almost impossible for the authorities to issue any further government debt at any price. This severely constrained the authorities’ ability to take a large share of the burden in addressing the banking sector losses, and thus led to a higher burden being borne by households and enterprises, in large part through the erosion of banks’ domestic currency liabilities through inflation”* (page 56). The acceleration of money

⁴⁰ Tang et al. provide a number of explanations for these differences, including: the impact of early hyperinflation on the value of bad debt in CIS countries; the multiplication of small banks that can be easily closed in the CIS, vs. large “too-big-to-fail” banks in Central and Eastern Europe.

creation might have led to an attack on the currency, as in standard models of currency crises (more on this later).

In other transition economies, two factors might have prevented the occurrence of a currency crash: i) smaller crisis-induced fiscal costs as a percentage of GDP; and ii) sounder overall fiscal position at the time of the banking crisis. The fiscal expenditures directly associated with the banking crises, along with the overall budget deficit estimated for some of the sample countries in Tang et al. (2001) are shown in Table A-16, in the Appendices.

2.2.2 Domestic Liquidity and Foreign Exchange Reserves

The literature on financial crises, and the numerous articles focusing on leading indicators of currency crashes, have all pointed out to the ratio of domestic liquidity to central banks' foreign exchange reserves as a sign of potential instability.⁴¹

The ratio of narrow money (M1) to central banks' reserves is shown in Table 1 below, for a sample of twelve transitioning economies, from 1991 through 2002. A non-weighted sample average is provided in the table to help assess the singularity (or lack thereof) of the Bulgarian experience. The data shown in the table was extracted from the IMF's International Financial Statistics database.

⁴¹ See Kaminsky, Lizondo and Reinhart (1997), discussed in Chapter 1; or Sachs, Tornell and Velasco (1996b), also introduced in Chapter 1 -- see footnote 7 in particular.

Table 1: Narrow Money (M1) to Central Bank's Foreign Exchange Reserves

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Central & Eastern Europe												
Bulgaria	3.7	1.9	2.5	1.2	1.4	1.2	0.7	0.7	0.6	0.6	0.7	0.7
Czech Republic	--	--	2.4	2.3	1.2	1.3	1.2	1.1	1.0	1.0	1.1	1.2
Hungary	2.1	2.2	1.4	1.3	0.6	0.8	0.9	0.9	0.8	0.8	1.0	1.5
Macedonia	--	--	1.2	1.6	1.3	1.2	1.0	0.9	0.8	0.8	0.2	--
Poland	2.7	2.4	2.3	2.0	1.0	1.0	0.9	0.8	0.8	0.8	0.9	1.1
Baltics												
Estonia	--	1.4	1.1	1.2	1.2	1.4	1.3	1.2	1.3	1.3	1.7	1.8
Latvia	--	--	1.3	1.2	1.3	1.2	1.4	1.5	1.3	1.5	1.2	1.4
Lithuania	--	--	1.6	1.2	1.2	1.2	1.3	1.0	1.1	1.1	1.1	1.1
CIS												
Georgia	--	--	--	--	0.7	0.9	1.1	1.2	1.2	1.8	1.2	1.1
Kazakhstan	--	--	3.0	1.4	2.0	2.0	1.6	1.3	1.2	1.0	0.9	1.0
Kyrgyz Republic	--	--	--	--	3.3	2.0	1.1	0.7	0.4	0.4	0.4	0.6
Ukraine	--	7.4	16.8	3.8	2.9	1.8	2.1	5.2	2.8	3.5	2.1	1.8
Non-Weighted Sample Average	2.8	3.0	3.4	1.7	1.5	1.3	1.2	1.4	1.1	1.2	1.0	1.2

Source: The IMF, International Financial Statistics, <http://ifs.apdi.net/imf>

As shown in the table, the ratio of M1 to foreign exchange reserves for Bulgaria was *below* average, during most of the sample years (except in 1991, when data was available for only three of the twelve countries).

The situation is radically different when looking at the ratio of *broad* money (M2) to central banks' foreign exchange reserves, displayed in Table 2 below. For all the years preceding the introduction of the currency board, Bulgaria's ratio far exceeded the sample average. In 1995, it was almost double that of the second highest (7.0 in Bulgaria; 4.3 in Ukraine; and 3.7 in the Kyrgyz Republic). Several factors may have contributed to the ballooning of broad money in Bulgaria, including relatively lax lending policies and delays in banking sector reforms; large accumulated savings held in the form of monetary assets; and high nominal interest rates on time and savings deposits.

Table 2: Broad Money (M2) to Central Bank's Foreign Exchange Reserves

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Central & Eastern Europe												
Bulgaria	14.7	7.4	11.5	6.6	7.0	6.0	1.6	1.5	1.3	1.5	1.7	1.7
Czech Republic	--	--	6.2	4.9	2.9	3.4	3.5	3.2	2.7	2.9	3.1	2.4
Hungary	4.0	4.6	3.0	3.1	1.6	2.1	2.3	2.3	2.0	1.9	2.4	3.7
Macedonia	--	--	9.3	3.1	2.1	2.1	1.8	1.8	1.5	1.6	1.2	--
Poland	6.6	6.5	6.6	5.5	2.9	2.7	2.5	2.3	2.4	2.7	3.4	3.1
Baltics												
Estonia	--	2.0	1.4	1.6	1.6	1.9	1.9	2.0	2.0	2.1	2.8	3.0
Latvia	--	--	2.3	2.3	2.0	1.8	2.2	2.3	2.1	2.5	2.2	2.6
Lithuania	--	--	2.5	2.1	1.9	1.8	1.8	1.5	1.9	2.0	2.0	1.9
CIS												
Georgia	--	--	--	--	0.8	1.1	1.4	1.7	1.9	3.0	2.3	2.1
Kazakhstan	--	--	--	--	--	--	1.8	1.7	1.6	1.7	1.9	1.8
Kyrgyz Republic	--	--	--	--	3.7	2.2	1.4	1.0	0.6	0.6	0.7	0.8
Ukraine	--	9.0	23.6	6.6	4.3	2.6	2.9	7.8	4.3	5.3	3.2	2.9
Non-Weighted Sample Average	8.4	5.9	7.4	4.0	2.8	2.5	2.1	2.4	2.0	2.3	2.2	2.4

Source: The IMF, International Financial Statistics, <http://ifs.apdi.net/imf>

The evidence and analysis provided in this section were necessarily simplistic. Yet, they allowed highlighting three important features of the Bulgarian economy in the years leading to the collapse of 1997:

- The origins of the banking crisis were similar to those observed in other transition economies. The magnitude of the crisis was not.
- The banking crisis in Bulgaria resulted in much larger fiscal and quasi-fiscal costs than in the other economies in the sample; and
- The ratio of broad money to foreign exchange reserves was consistently higher than in other economies; even *prior to* the hypothesized acceleration of money printing induced by the banking and fiscal crises.

Some of these characteristics are discussed in Chapter 3.

2.3 Existing Analyses of Bulgaria's "Twin Crises"

This section presents a number of publications that have attempted, *more or less directly*, to describe and explain the Bulgarian crisis of 1996-1997. Key findings are summarized here; data, concept and ideas borrowed from these publications are used later in the text and are duly referenced.

2.3.1 Descriptions of the Crises

Dobrinsky (1997) provides three major contributions to the understanding of the crisis: i) the role of historic fundamentals and the concept of "*bubble economy*;" ii) the presentation of the crisis as a "*triple drain crisis*;" and iii) the central role of money demand and interest rate differentials in the onset of the exchange rate collapse.

Over the second half of the eighties, Bulgaria's gross foreign debt more than tripled.⁴² This "*foreign debt bubble*" enabled the country to finance growing current account deficits, as poorly competitive Bulgarian exports were stagnating, while import costs were rising.⁴³ According to Dobrinsky, the economic reforms of the early nineties did not fully eliminate the bubble, as a moratorium on foreign debt temporarily shielded the country from the needs to restructure. During that period, a new "*transition bubble*" was building-up. For various reasons, policy makers in

⁴² According to the author, this extraordinary growth occurred because financial markets had misjudged the ability of the country to earn foreign exchange; the lack of clairvoyance of international lenders resulting from the privileged position of Bulgaria within the CMEA (with excessively under-priced imports, and over-priced exports). Dobrinsky (1997), page 3

⁴³ Partly as a result of the increase in oil prices and the end of Bulgaria's special status within the CMEA

Bulgaria refused to implement drastic (shock-therapy) structural reforms.⁴⁴ Instead, the authorities tolerated poor financial discipline and the accumulation of payment arrears. State-owned firms gradually stopped servicing their old bank credits, transferring the adjustment burden to the banking sector. A number of troubled banks were bailed-out unconditionally, through the replacement of non-performing loans with government debt (the ZUNK bond program), further postponing the required adjustments. In addition, delays in privatization and the absence of adequate governance on the way to privatization created a “*power vacuum*” and opened the door to fraudulent activities in both state-owned firms, and public and private banks.⁴⁵ These value-subtracting activities (together with the mere continued operation of loss-making firms) eroded the capacity of the country to earn foreign exchange. This “*transition bubble*” became visible with the resumption of foreign debt payments in June 1994, and finally burst in the spring of 1996.

Dobrinsky presents the Bulgarian experience as a “*triple drain crisis*,” combining two internal drains (banking and fiscal) with an external drain (balance-of-payments, run on the currency). Unfortunately, the links between the three drains are not well established, and remain anecdotal at best. The banking crisis evolved in three steps. In the first step, commercial banks inherited large non-performing loans from the pre-transition era. The combination of soft budget constraints and lack of restructuring led to the accumulation of *new* bad loans (second step), which eventually led to liquidity problems and bank runs (third step). Dobrinsky also stresses the

⁴⁴ Delays in privatization and restructuring are addressed at length in the third chapter of Dobrinsky (1997), which includes a review of the literature on delayed reforms.

⁴⁵ Asset stripping, transfer pricing, insider lending, and other violations of banking regulations became common at that time.

corrupt behavior of banks, the existence of so-called business groups investing depositors' money in shady endeavors, and the inconsistency of government rescue programs (sending the “*wrong signal*,” through unconditional bailouts) in explaining the deterioration of banks' portfolio.⁴⁶ The banking panic was *allegedly* magnified by problems in the implementation of deposit insurance: the first formal deposit insurance scheme was implemented in December 1995, but offered only a limited protection. The announcement of the scheme *itself* was perceived as a sign of instability and added to the panic. The revision of the scheme in March 1996, with a 100 percent guarantee on household deposits, came too late to stop the runs, as the confidence of the public “*was already ruined*” (page 38). The second drain, the fiscal crisis, is also presented as a three-step process. Again, large restructuring problems were inherited from the communist era. Delays in structural reforms led to the accumulation of quasi-fiscal and fiscal deficits, through tax arrears, and the fiscalization of bad loans (second step). Finally, large bank rescue operations (with further fiscalization of bad debts and payments for deposit insurance) led to “*a swelling of public debt*” (page 32); the servicing of which created large budget deficits, eventually financed by money printing. The third drain, the currency crisis is presented as “*the core of the crisis.*” Interestingly enough, Dobrinsky compares the crisis of 1997 with the March 1994 currency crash. The reductions in the basic interest rate of June and August 1993 eliminated the interest rate differential in favor of the Lev and “*destabilized*” money demand. The BNB was forced to intervene massively to support the Lev in the foreign exchange market. When it ran out of reserves, the exchange rate surged. *Similarly*, interest rates were lowered in the spring of 1995,

⁴⁶ In accordance with evidence from other transition economies reported in Tang et al. (2001)

allegedly leading to a reduction in money demand and an acceleration of capital flight. The crisis was magnified by problems in the banking system, as domestic currency deposits were withdrawn from banks and converted into foreign cash. Developments in the foreign exchange market led to a general loss of confidence, and a “*sliding down*” of the economy into further depreciation and near-hyperinflation.

Finally, Dobrinsky provides a simple theoretical framework to help explain the crisis. In this framework, the interest rate is exogenous and determines the level of money demand. Money supply is endogenous and “*accommodates*” money demand (page 30). The exchange rate is also endogenous, and equilibrates the goods and money markets.⁴⁷ In this simplified economy, the equilibrium exchange rate is unstable if money demand is unstable: “*the destabilization of money demand in such a set-up may trigger overall macroeconomic instability and result in a crisis*” (page 31).

The **OECD (1997)** provides an original description of the Bulgarian economy and a detailed account of macroeconomic performance through 1996. The organization views the interactions between commercial banks and state firms in Bulgaria as an “*interface*” providing opportunities to channel resources from the

⁴⁷ Dobrinsky’s theoretical setup is quite surprising. First, assuming that the exchange rate equilibrates the good (IS) market is a bit far-fetched, especially so in transitioning Bulgaria. Second, and more importantly, standard models of currency crises (Dobrinsky refers to Krugman’s 1979 seminal paper) assume some sort of disconnect between money supply and money demand (desired holding of domestic currency), which is clearly incompatible with a residual (accommodating) money supply. The theoretical hurdle that Dobrinsky had to overcome is the combination of an exogenous policy controlled interest rate with an exogenous money supply, as in Krugman’s 1979 model. One alternative, discussed later in the paper, would be to keep desired (domestic) money holding as a function of interest rates, endogenize money supply through the government budget constraint, and make the exchange rate a function of “excess money supply” in the foreign exchange market, as in standard models of currency crises.

central bank and the government budget to private entities. A state firm manager, or group of managers, would set-up a small private company using, directly or indirectly,⁴⁸ the assets of the state company for its own profit. The state firm, for various reasons (including the existence of the parasite firm), would generate losses, accumulate payment arrears, and eventually default on the servicing of its bank loans. The lending commercial bank would write-off the loan as a bad loan and shortly thereafter be refinanced by the central bank, or bailed-out by a government rescue operation. In essence, the manager had acquired public resources through the state firm and the banking system.

As in Dobrinsky (1997),⁴⁹ the OECD views money demand as the *fundamental* source of instability: the reductions in real money demand of late 1995, in particular, occurred *before* the acceleration of money supply growth. The OECD links the *deepening* of the currency crisis, and the surge of inflation, to difficulties in the banking system: it is the monetization of large budget deficits due to the servicing of domestic debt associated with bank rescue programs that led to the rapid deterioration of the economy in mid-to-late 1996.

For **Kenningham (1997)**, the fiscal crisis was at the core of the 1996-1997 collapse: “*one of the key reasons for the economic collapse of 1996-97 was that an unsustainable domestic debt had been accumulated since 1990*” (page 9). The associated interest payments⁵⁰ and large budget deficits made it impossible for the

⁴⁸ Through joint ventures, leasing arrangements or transfer pricing. Miller (1994), for example, suggested the existence of shadow firms and transfer pricing, the mechanics of which have been demonstrated in Gros, Miller and Tzatchev (1996).

⁴⁹ Rumen Dobrinsky provided consulting support in the preparation of the OECD report.

⁵⁰ Representing about a fifth of GDP in 1996

government to stabilize the economy. In short, as in standard models of financial crises, the failure of the economy originated from large fiscal slippages. Surprisingly, Kenningham also observes that pressures appeared in the foreign exchange market, “*whenever industrial wages had risen significantly above \$100 per month*” (page 13). This occurred prior to both the 1994 and 1996-97 currency crashes.⁵¹

Wyzan (1998) focuses on the foreign exchange crisis, because “*crises in Bulgaria, as in many emerging markets, arise in the foreign exchange market*” (page 12). According to the author, the economy suffered principally from the combination of low international reserves, large foreign debt and debt service payments, and troubled relations with the IMF and the World Bank.⁵² Wyzan also identifies a “*peculiar business cycle*” in Bulgaria. Between the tumble of the Communist regime through the spring of 1997, the economy went through periods of relative exchange rate stability (1992-1993, 1995), followed by periods of rapid depreciation (1994, 1996-1997). The transition from tranquility to turbulence was allegedly precipitated by two main factors: i) the interest rate policy pursued by the BNB, and ii) expectations about what the IMF and the World Bank would do, in relation to the level of foreign exchange reserves. In Wyzan (1998) (as in Sachs (1998) or Krugman (1979)), foreign exchange reserves are a key determinant of inflationary expectations, and overall macroeconomic stability.

⁵¹ This argument would support Dornbusch (1996) and Dornbusch, Goldfajn and Valdés (1996)’s analysis of currency crises, focusing on real exchange rate movements.

⁵² As in Dobrinsky (1997), however, the *root* of Bulgaria’s economic problems is the lack of structural reforms.

Enoch, Gulde and Hardy (2001) provide a detailed chronological account of the banking crisis, summarized in Table A-18, in the Appendices.⁵³ Unfortunately, the paper provides only limited information as to how the currency crisis started and developed. No attempt was made to link the banking panic to the near hyperinflation episode of early 1997, besides referring to “*a general loss of confidence*” (page 72).

2.3.2 Empirical Investigations Related to the Crises

There are a few empirical investigations *related to* Bulgaria’s twin crises. Most of these studies examine the determinants of “money demand,” and attempt to evaluate how these determinants evolved during and after the crisis.

Nenovsky and Yotzov (1997) estimate various models of money demand, using monthly data from January 1993 through February 1997. The models estimated in the paper include a transactions model (relating real money holdings to real household income, industrial production or real proceeds from industrial sales); an inflation model (in the tradition of Cagan (1956)) and a “synthetic” model (combining real household income, the nominal interest rate⁵⁴ and inflation). Their empirical results indicate i) a remarkably stable relationship between the demand for *narrow* money and household income; ii) a negative but insignificant impact of interest rates on narrow money; iii) the absence of cointegration between the demand for broad money (M3) and measures of real sector activity; and iv) non conclusive results

⁵³ Many of Enoch, Gulde, and Hardy (2002) findings are also used in the discussion on “Bank Weaknesses” in Chapter 3.

⁵⁴ Or the interest rate differential between the basic interest rate of the BNB and the yield on government securities.

regarding the impact of interest rates on broad money (the impact is either positive or negative, and insignificant). They also observe that i) inflation and the exchange rate perform consistently *better* than the nominal interest rate as proxies for the opportunity cost of holding money; and ii) exchange rate movements have a *stronger* impact on money demand than inflation. They argue that these findings support the notion that in “*a small and open economy, managing the exchange rate is the most successful way of controlling liquidity*” (page 35).

Slavova (2002) estimates the demand for money in Bulgaria between 1991 and 2000. She considers three periods, or “regimes:” pre-crisis, crisis, and post-currency board. Her empirical results indicate a number of *shifts* in the demand for money. In the pre-crisis period, key determinants of money demand include the interest rate on Lev deposits and the price level. During crisis episodes, however, variations in money demand depend *solely* on the inflation rate.

Beck, Miller and Saad (2002) examine money demand and price determination in Bulgaria using a smooth-transition model. They find no significant relationship between the growth rate of money supply and domestic inflation, *after controlling for expected inflation* (measured by past inflation, through adaptive expectations). They also find that the relationship between inflation and inflationary expectations changed after the introduction of the currency board. They argue that this change could not be explained by the behavior of money supply itself but, possibly, by a renewed trust in government policy. In other words, the currency board would have helped reduce inflation not only through a “mechanical” reduction in monetary growth, but through its impact on the credibility of governmental actions and Bulgarians’ inflationary expectations.

Other empirical studies include Mihov (2002)'s vector autoregressive model analysis (discussed briefly in Chapter 3), and Carlson and Valev (2001)'s survey of inflationary expectations.

To conclude, existing investigations related to the crisis tend to indicate that i) interest rate movements had little impacts on money demand, invalidating, *somehow*, the thesis put forth in Dobrinsky (1997); ii) future expected inflation (and depreciation) were key in understanding observed money demand instability and price movements; and iii) there is no direct relationship between monetary growth and inflation, *when accounting for inflationary expectations*.⁵⁵ The primary caveat of these studies is that they all assume adaptive expectations, and use past inflation to derive expected inflation. Given the strong autoregressive component of the price series in Bulgaria, it is only moderately surprising that measures of money demand M/P are tightly related to past changes in P. Secondly, the apparent failure of monetary growth in explaining price movements does not imply that monetary aggregates are irrelevant in understanding Bulgaria's crisis (see in particular Sachs, Tornell and Velasco (1996b)'s comments on the *stock* of M2 in relation to foreign exchange reserves).

2.4 Summary of Findings and Conclusions

Three competing, but not necessarily incompatible, explanations emerge from the review of existing research on the Bulgarian crisis:

⁵⁵ Interestingly enough, Sgard (1999) stresses that *both* monetary (quantitative) and expectational factors were important during Bulgaria's twin crises. This "hypothesis" however, is not formally tested.

i) The crisis emerged in the foreign exchange market. Lev deposits were being withdrawn to speculate against the domestic currency; this is essentially the thesis put forward by Dobrinsky (1997) and Wyzan (1998).

ii) The crisis emerged in the banking sector. Large central bank refinancing and government rescue programs eventually led to fiscal slippages, a loosening of monetary policy and escalating inflation and depreciation; this is the view articulated in Gulde (1999) or Balyozov (1999).⁵⁶

iii) The crisis was fundamentally a debt crisis: the government was financially vulnerable (and eventually became insolvent); and Bulgarians realized that it would not have the means to absorb the losses associated with the banking crisis, nor meet its domestic and foreign debt obligations without the help of a foreign lender. In other words, as highlighted by Berlemann, Hristov and Nenovsky (2002), or indirectly by Wyzan (1998),⁵⁷ in the tradition of Sachs (1998) or Dooley (1997), it is the - rightful - perception that the consolidated government (inclusive of the central bank) could no longer act as a lender of last resort that precipitated the attack on the Lev and the collapse of the economy. Note that the banking-crisis-induced fiscal deficits were eventually financed through foreign exchange reserves and the inflation tax (hyperinflation).

Our view, articulated at the end of Chapter 3, after a detailed chronological account of the crisis, is close to the third explanation, above.

⁵⁶ A description of Balyozov's work is provided in Chapter 3

⁵⁷ And his analysis of Bulgaria's relations with the IMF