

**ONCE BITTEN, TWICE SHY:  
THE EFFECT OF A BANKING CRISIS ON EXPECTATIONS  
OF FUTURE CRISES**

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## **Executive Summary**

Survey data from Bulgaria show that people who had experienced a loss during a banking crisis are significantly more likely to expect a new crisis. This result holds despite 12 years between the earlier crisis and the survey, and the dramatically improved performance of the financial sector and the economy in the meantime. However, we find that earlier experiences affect expectations only for less informed individuals. People with greater ability/motivation to evaluate the economy are unaffected by their prior experiences.

## **Introduction**

The first and foremost promise made by banks is to keep the money of depositors safe. Households are asked to trust the banks that their money will be available for withdrawal in the future, with some interest. Financial intermediation is possible only if that promise is credible. Otherwise, households hoard cash, limiting the scope for development of formal financial institutions. Guiso, Sapienza, and Zingales (2004), Knack and Keefer (1997) and others show that trust and social capital are essential determinants of financial development.

While the role of trust in financial development is accepted and has been investigated by the literature, the origins of incomplete trust have not been studied extensively. We make a contribution in that area. Specifically, we ask whether prior experience with a banking crisis leads to persistent expectations of banking crises in the future. Believing that banks would be stable may not be easy in countries that have experienced sweeping financial crises. A financial crisis could then have a long-term negative effect on financial development if it generates expectations of future crises and limits the use of financial services.

To address this question, we use unique survey data from Bulgaria. Bulgaria's banking system imploded in 1996, midway through its transition from communism. Many people experienced a large drop in income and lost much of their savings. Twelve years later, in 2008, a national household survey asked respondents about the likelihood of a banking crisis during the next months or years. It also inquired about respondents' experiences during the crisis in 1996. These two questions, along with a number of control variables, allow us to test how prior experiences with a banking crisis condition expectations of another crisis. Indeed, we find that people who were adversely affected by the crisis are significantly more likely to expect a new crisis. Given the length of time and more recent, sustained stability and growth in the Bulgarian

economy, this persistent effect of a past negative experience on current expectation indicates how difficult it is to regain trust in the financial sector.

In addition, we separate the sample into groups to investigate whether heterogeneity in actors' effort/ability to process information affects expectations formation in an environment with changing economic structures. Using a number of different methodologies to divide respondents into what Haltiwanger and Waldman (1985) refer to as "sophisticated" vs. "naïve" individuals, we find naïve respondents rely more on past, particularly negative, experiences in forming expectations than their more sophisticated counterparts for whom differential past experiences have no appreciable effect on expectations.

Our paper addresses issues of beliefs and trust that have received significant attention in the literature. However, we investigate the *determinants* of beliefs as opposed to the *effect* of beliefs on economic and financial outcomes that have been the focus of earlier papers.<sup>1</sup> The effect observed in our survey data is quite similar to the hysteresis of currency substitution widely documented in the literature. Calvo and Vegh (1992) note that while an episode of high inflation leads to a sharp increase in currency substitution, the effect is not reversed when inflation declines. Instead, foreign money continues to be used for savings and transactions.

One of the explanations for this ratchet effect is incomplete trust following the high inflation episode (Melvin and Fenske, 1992; Clemens and Schwartz, 1993). Calvo's (1986) paper on "temporary stabilizations" builds on a similar idea: in countries with a history of crises economic agents do not expect stabilizations to be permanent. That belief influences behavior and macroeconomic outcomes. The well-known "peso problem" also refers to persistent

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<sup>1</sup> That past events affect expectations is not a surprise. Studying the Great Depression, Cagan (1965) modeled expectations of the future rate of loss on deposits as depending on some average of the past experience of losses. Yet, adaptive expectations with such a long tail have not been documented formally, especially, on the micro level.

expectations of currency devaluation despite years of financial stability under a fixed exchange rate regime.

In short, the idea that instability generates expectations of instability for a long time is common in the literature. Yet, it has been difficult to document and quantify this link because expectations are not observed directly, especially when it comes to expectations of banking crisis. When available, data on forward currency contracts and interest rate differentials might be used to gauge expectations of devaluation. However, similar measures for incomplete trust are not available for banks. We fill this gap with the survey data.<sup>2</sup>

The literature, e.g. Haltiwanger and Waldman (1985), has also investigated models with heterogeneous agents where some agents are more informed and react to new information while others form more adaptive expectations. Our results provide empirical support for this notion. In particular, we find that prior experiences influence primarily the expectations of individuals who are less informed about the economy. The more informed agents are affected significantly less by their experiences during the 1996 crisis, perhaps due to the almost completely new economic environment in Bulgaria in 2008. In contrast, the expectations of less informed agents are more significantly anchored in the past. Furthermore, the results show that the adaptive component of expectations has quite a long tail – at least 12 years. In that sense, we observe a prolonged “stickiness” of information as investigated by Mankiw and Reis (2002).

The rest of the paper is structured as follows. The following section presents brief background notes on Bulgaria’s banking and currency crisis in 1996 as well as information on

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<sup>2</sup> Our focus on the effect of prior experiences with financial crises on expectation is relevant for a number of countries that have experienced such events. For example, it has also been noted that experiences continue to influence beliefs even after people relocate. For example, a practitioner’s guide for U.S. bankers on how to attract immigrants to the banking system (Appleseed, 2006) mentions “trust” many times. It also explains that the lack of trust is attributed to negative experiences with banking in the immigrants’ country of origin.

economic performance since that time. We then describe the survey instrument before leading into the regression model and results. Finally we offer some concluding comments.

## **I. The 1996 Financial Crisis in Bulgaria**

Bulgaria experienced one of the sharpest financial crises in Eastern Europe during its transition from socialism. During the banking crisis in 1996 and the first months of 1997, 56.3 percent of the loans on the books of state-owned banks were classified as “non-standard”, i.e. loans with payment delays or outright defaults. Even worse, 66.7 percent of the loans of smaller privately owned banks were non-standard (BNB, 1996).

Throughout 1996, the government attempted to assist banks by infusing large amounts of government funds but, eventually, a number of banks collapsed and the infusion of money into the financial system set off inflation. The peak came in February 1997 when CPI inflation reached 300 percent on a monthly basis. The local currency depreciated sharply, further exacerbating the condition of banks with large foreign exchange liabilities and domestic currency assets.

The financial crisis had been building up for some time since Bulgaria was too slow to reform its real economy. State owned banks and many private banks channeled funds to inefficient government enterprises that were considered too important to liquidate. Credits to these firms often served to cover losses and to service existing loans. While this worked for a few years, eventually the firms could not service their debts. In the meantime, the liberalization of financial markets and the lax supervision resulted in the creation of a number of new private banks that were not managed well and often served to generate funds for the business activities of their owners. Corruption and government interference in lending was widespread

(Dobrinsky 2000).

Following the crisis, the government embarked on massive structural reforms privatizing and liquidating loss-making government enterprises. The government also withdrew from the private credit market and privatized all banks, in most cases selling them to foreign banks. By the time of the survey in 2008, more than 90 percent of Bulgarian banks have been owned and operated by foreign banks for several years. Various financial services such as mortgages, credit for small firms, a range of saving accounts, electronic payments, and personal and business lines of credit were introduced. Prudential supervision and regulation were strengthened substantially. A transparent and fairly generous deposit insurance system was introduced. The investment in banking services generated a network of convenient branch locations throughout the country.

In broader macroeconomic context, in 1997 Bulgaria introduced a currency board with a peg to the Deutsche mark and later to the Euro. The currency board lowered inflation to single digits within months. Economic growth also accelerated. Bulgaria experienced strong annual growth from the time it ended the largest structural reforms in 2002 to 2008. At the time of the survey, there were no indications of economic slowdown or risks in the banking system. The percent “non-standard” loans were well below 5 percent. Membership in the EU and NATO gave assurances to foreign investors who poured in significant amount of funds.

Bulgaria continues to have a high level of corruption, weak governance, and low level of income. Yet, objectively, the fundamental reasons for the 1996 banking crisis were largely resolved well in advance of May 2008, when the survey was carried out. At the time of the survey, it was also months before the global financial crisis began. Even when the crisis started, Bulgaria’s banks continued to operate without much problem.



## II. Survey Data

We use data from a survey of households carried out in May 2008. The survey is national in the sense that it polls 1000 households, a standard sample size for national surveys of Bulgaria's population of 8 million, and the sampling ensured representativeness with respect to demographics such as income, place of residence, education, and age. The data were collected by professional interviewers at the residence of each household. The survey project was conducted and supervised by Vitosha Research, an established Bulgarian polling agency. The question about the banking crisis was formulated as follows:

*“In your opinion, how likely is it that the Bulgarian banking system will experience a crisis with several banks collapsing and depositors losing some of their savings during the next 6 months/1 year/5 years?”*

Table 1 reveals doubts in the stability of the banking system. About 13 percent of the respondents believed that a banking crisis was likely or very likely (categories 1 and 2) even at the 6 months horizon. Confidence in the stability of the banking system diminishes the longer the time horizon. Twenty four percent of respondents believed that a banking crisis is likely or very likely at the five year horizon. Only about a third of the respondents believed that a banking crisis was unlikely or very unlikely (categories 4 and 5). The survey also inquired about experiences during the 1996 crisis:

*“Did you or members of your household lose money during the 1996 crisis?”*

Respondents could answer: 1) we lost a large amount; 2) we lost some money; 3) we didn't lose anything; or 4) I don't know. Table 2 shows that well over 40 percent of the respondents reported experiencing a loss with over 10% experiencing a large loss. The cross tabulation of experiences and expectations in Table 3 gives a preliminary glance of the effect of losses during the crisis. The table shows the percent of respondents who believed that a banking

crisis is likely or very likely across the different time horizons for three groups – those who “lost a lot,” “lost some,” or had “no loss.”

Respondents who lost money during the crisis were more likely to expect a crisis in the future. For example, 15.8 percent of respondents who had not lost anything in 1996 believed that a banking crisis was likely or very likely within one year, compared to 23.1 percent of those who had lost some and 27.0 percent of those who had lost a lot. These differences are more pronounced over longer time horizons. With the five years time frame, close to half (40.5 percent) of the respondents who had lost a lot believed that a crisis was likely or very likely. That percent was more than twice greater than the percent for respondents who had not lost anything (18.8 percent).

Additional demographic data include age, income, gender, urban residence, marital status, and educational attainment. Age is simply the respondent’s age in years. The income variable ranges from 1 to 9 with each number corresponding to an income range. Approximately 50% of the respondents have income in the first through fifth income ranges. Educational attainment is a dummy variable taking the value of 1 when the respondent’s highest level of educational attainment is at the college or post-graduate level.

### **III. Empirical Results**

A series of regression models were used to determine whether the experience of the banking crisis in 1996 continued to affect expectations of crisis 12 years later. To examine this we include two dummy variables, “lost a lot” and “no loss”, leaving “lost some” as the reference group. In addition, we examined whether standard demographic characteristics also can help explain crisis expectations. Our baseline results are obtained with a probit model where the

dependent variable is a dummy variable equal to 1 for high and very high likelihood of a crisis, and zero otherwise. Later we discuss estimations from ordered probit models and models with self-selection, among other robustness checks.

To facilitate the interpretation of the results, we report the marginal effects of the probit estimations instead of the estimated probit coefficients so that we can discuss not only the direction of the effects but also their sizes. The estimated probit coefficients are based on a non-linear estimation technique and cannot be interpreted readily in terms of the quantitative sizes of the effects. Calculating the marginal effects is a method to find the quantitative effect of an independent variable. The marginal effect indicates the change in the share of individuals (or the probability of) belonging to the “high or very high likelihood” category when the independent variable increases by one unit. If the independent variable is a dummy variable such as education, the marginal effect shows the difference in the likelihood of reporting a high or very high likelihood compared to the reference group. Other independent variables are held at their mean when computing the marginal effects for a particular independent variable.

Table 4 shows that experiences with the 1996 crisis affect expectations. The “no loss” dummy variable is negative and statistically significant at both the six months and the five years time horizons. Along with the insignificant “lost a lot” dummy variable, this suggest that people who lost money in 1996 are more likely to expect a banking crisis in the future, regardless of the extent of their loss. At the five year horizon, the magnitude of the loss becomes important. Respondents who lost a lot are substantially more likely to expect another banking crisis. People who had lost a lot during the crisis were 17.8 percentage points more likely to expect a banking crisis during the next five years. Income and age were not statistically significant.

### *Robustness Tests*

Table 5 presents a series of robustness tests. For conciseness, we report the empirical results using only expectations of a banking crisis during the following year but we obtained similar results with the six months and five years time horizons. Also, for conciseness, we report only the coefficients of the dummy variables for prior experiences. However, all models include age and income. In column (1) we estimate the benchmark model with ordered probit using all five answers that people could choose from when answering the expectations questions. The estimated effects are similar to the ones reported in Table 4 – losses during the crisis are associated with elevated expectations of a new crisis.

In column (2), we revert to the probit methodology but exclude all of the respondents who did not report expectations of a banking crisis. This reduces the sample by about 20 percent but does not affect the statistical significance of the loss variables. In fact, the coefficients also remain roughly the same. Column (3) reports the estimations of a Heckman's (1979) procedure to correct for a potential self-selection bias. The procedure is necessary as the selection process (respondents who do not give a forecast) may not be random and that respondents self-selected on the basis of observable factors.

Hence, estimated coefficients might be biased. Heckman's procedure involves the maximum likelihood estimation of a participation equation which explains the decision to provide a forecast and a regression equation relating expectations to the loss variables and demographics. It produces consistent and asymptotically efficient estimates by taking into account the correlation of the error terms in the two equations. Note that we obtain similar results as in the estimation without correcting for self-selection. Moreover, the estimate of the correlation of the residuals of the two equations ( $\rho$ ) is not statistically significant, indicating that

self-selection is not an issue.

Then, in columns (4)-(7) we include additional variables, one at a time. In particular, we include 1) *education*, measured with a dummy variable that equals 1 for respondents with more than secondary school education; 2) *gender* (1 for female respondents, 0 otherwise); 3) *urban*: 1 if a respondent resides in a city, and 0 for small towns and villages; and 4) *marital status*: 1 if married and 0 otherwise. The reported results show that the effect of the loss variables is unaffected by the inclusion of these additional demographic characteristics. In fact, the results stand even if we include all of the demographic variables in one equation (column 9).

### *Sophisticated and Naïve Individuals*

Next, we estimate the benchmark model when the sample is split into two groups, approximating for what Haltiwanger and Waldman (1985) refer to as “sophisticated” and “naïve” actors. We are motivated by the theory of rational expectations in the sense that rational actors will adapt their expectations when the structures of a system are changed (Sheffrin, 1996) as they have in Bulgaria. However, we explore the possibility of heterogeneity in the actors’ effort/ability to collect and process relevant information. We formulate the hypothesis that more sophisticated respondents are more likely to recognize and adapt expectations to a changed environment and conversely, are less influenced by prior experiences. We can formulate this hypothesis with our sample because Bulgaria’s banking system and, in fact, its overall economy in 2008 was dramatically different from its state in 1996.<sup>3</sup>

We use four variables to distinguish between sophisticated and naive individuals. First,

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<sup>3</sup> This duality of the influence of both past experience and assessments of a changing environment parallels work on trust formation. Platteau (1994a, b) distinguishes between personalized trust formed over repeated interactions and generalized trust that arises from the actors’ knowledge of counterparts, the incentive they face and even their upbringing. Platteau notes the differences in relative costs of these two types of trust formation. The generalized

respondents are split according to self-reported claims of being informed. In particular, we provide results for respondents who agreed or strongly agreed with the statement:

*“I am well informed about how to make personal financial decisions.”*

Results for all others, including those who didn’t answer or responded “I don’t know” are reported separately.

Next, we provide regression results when the sample is split according to how well informed respondents actually are as revealed by their responses to a following true statement:

*“Inflation in Bulgaria has been below 15% for the past 5 years.”*

Respondents who agreed or strongly agreed with that statement are considered to be better informed.

For the final two groupings, we use income and education. While income does not increase an individual’s ability to process information, it may provide greater motivation to assess changing circumstances (more of wealth is from accumulated financial assets). The last split is based on educational attainment. Much higher education is focused on issues unrelated to the economy. Still, it may facilitate an assessment of changing circumstances.<sup>4</sup> Correlations of the underlying series used to construct these variables (not reported) range between -0.25 and 0.36.

The results, reported in Table 6 indicate that experiences with the 1996 crisis do not affect the expectations of respondents who are more sophisticated using either definition of being informed (columns 1 thru 4). In contrast, the prior experience enters significantly in the regressions explaining the expectations of the less informed, “naïve” group. The split samples based on income and higher education are presented in columns (5)-(8). Negative experiences

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trust formation is cheaper and faster.

with the 1996 crisis did not affect expectations of the more sophisticated parts of the population measured either by income or educational achievement. The results are consistent with our hypothesis that more sophisticated actors can adapt expectations to changing structures while expectations of relatively naïve actors are more likely to rely on past, particularly negative, experiences. The results are robust to changes in the sample dividing point in both directions.

#### **IV. Conclusions**

The results presented in this paper show that prior experiences with a banking crisis elevate expectations of a new crisis. This result is robust to various econometric specifications and robustness tests. Furthermore, past experiences in a changing economic environment have persistent effects on the expectations primarily of “naïve” respondents who are less informed about the economy. Structural reforms can reduce a crisis’ effect on expectations, but, as our results show, this may be largely limited to a more “sophisticated” segment of the population who are more likely to recognize that the drivers of earlier crises are no longer a major issue. Efforts of policymakers to encourage actors to adapt their expectations to an improved economic environment following a crisis face a significant challenge and should take into account different segments of the population. Those most likely to change their expectations are the relatively well informed and those who did not experience a personal loss.

However, policy makers can also try to limit the influence of naïve actors with efforts to reduce strategic complementarities. As Haltiwanger and Waldman (1985) show, when there are strategic complementarities, naïve actors can have a more than proportional effect on economic outcomes, lengthening the persistence of a shock. Banking crises are an example of a situation

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<sup>4</sup> The degree of information, often measured by education, has been used by the previous literature (e.g. Carlson and

with such strategic complementarities. Sophisticated actors will pull their money on a rumor of a bank run even if they know that the bank is solvent because it is their interest to behave like a naïve actor. If naïve actors act on unfounded rumors, they can cause a liquidity crisis and thus bankruptcy. To avoid being left last in line of a failing bank, the sophisticated actors will act on an unfounded rumor, too. Deposit insurance breaks the complementarity, reducing the persistence of a negative shock. Because sophisticated investors believe in the deposit insurance, they leave their money in the bank and the liquidity shock of withdrawals from naïve actors is lessened.

The banking crises literature that considers macroeconomic impacts largely concentrates on the short-term output contraction associated with a crisis (e.g., Dell’Ariccia, Detragiache, and Rajan, 2005). An important issue in that literature is to resolve causality, i.e. whether a banking crisis causes a contraction or the contraction leads to a banking crisis. In that debate, however, the question of long-term negative effects has received very little attention. We are aware of one paper (IADB, 2004) that looks at the long run. The authors find that a banking crisis reduces *long-term* economic growth by about 1 percentage point. While that paper doesn’t investigate the channels of this effect, our results suggest that a crisis’ persistent effect on expectations of future crisis may affect long-term decision-making and, in particular, financial development, producing a drag on economic growth for a number of years after the crisis.

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Valev 2001) to proxy for the degree of “rationality.”



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Table 1. Expectations of banking crisis

	<i>In your opinion, how likely is it that the Bulgarian banking system will experience a crisis with several banks collapsing and depositors losing some of their savings during the next:</i>		
	6 months	1 year	5 years
Very likely 1	6.7	9.6	13.9
2	6.5	9.7	8.9
3	18.0	17.9	14.5
4	17.9	16.5	12.6
Very unlikely 5	31.0	24.9	18.5
Don't know/No Answer	19.9	21.4	31.6
Total	100.0	100.0	100.0

Notes: Percent respondents in each category.

Table 2. Experiences during the 1996 crisis

<i>"Did you or members of your household lose money during the 1996 crisis?"</i>	
Lost a large amount 1	11.1
Lost some amount 2	31.1
We did not lose anything 3	48.8
Don't know/No Answer	9.0
Total	100.0

Notes: Percent respondents in each category.

Table 3. Past experiences and expectations

Respondents who	<i>The percent of respondents who believed that a banking crisis is likely or very likely in the next:</i>		
	6 months	1 year	5 years
Lost nothing	11.8	15.8	18.8
Lost some	16.1	23.1	26.0
Lost a lot	18.0	27.0	40.5

Table 4. Experiences and expectations: Probit analysis

	Dependent variable: 1 if respondent believes that banking crisis is likely or very likely, 0 otherwise		
	6 months	One year	Five years
Lost a lot	0.024 (0.037)	0.037 (0.044)	0.178*** (0.053)
No loss	-0.046** (0.023)	-0.062** (0.028)	-0.040 (0.031)
Age	0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)
Income	-0.007 (0.005)	0.004 (0.005)	0.006 (0.006)
Chi 2(4)	11.33**	9.35**	23.01***
Number of observations	880	880	880

Note: \*\*\* (\*\*, \*) indicates statistical significance at the 1 (5, 10) percent level.

Table 5. Experiences and expectations. Robustness checks.

	Ordered probit	Excluding "I don't know" answers	Heckman model	Adding education	Adding gender	Adding urban	Adding married
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lost a lot	0.065 (0.128)	0.005 (0.050)	0.007 (0.051)	0.036 (0.045)	0.036 (0.044)	0.040 (0.044)	0.034 (0.044)
No loss	-0.213** (0.088)	-0.085** (0.035)	-0.085** (0.035)	-0.061** (0.028)	-0.061** (0.028)	-0.060** (0.028)	-0.059** (0.028)
P			-0.081 (0.208)				
Chi 2(# expl. variables)	12.79**	11.14**	10.93**	11.14**	10.39*	10.57*	9.78*
Number of observations	688	688	880	880	880	880	880

Note: \*\*\* (\*\*, \*) indicates statistical significance at the 1 (5, 10) percent level.

Table 6. Experiences on expectations: split samples of “sophisticated” and “naïve” respondents. The dependent variable equals 1 if a banking crisis is believed to be likely or very likely, and 0 otherwise.

	Informed about personal finances		Informed about the economy		Income		Education	
	More informed (1)	Less informed (2)	More informed (3)	Less informed (4)	Higher income (5)	Lower income (6)	More education (7)	Less education (8)
Lost a lot	0.101 (0.072)	-0.014 (0.054)	0.021 (0.099)	0.042 (0.049)	0.027 (0.062)	0.049 (0.063)	0.020 (0.088)	0.039 (0.051)
No loss	-0.031 (0.044)	-0.082** (0.036)	-0.037 (0.059)	-0.076** (0.032)	-0.049 (0.039)	-0.079** (0.039)	-0.067 (0.062)	-0.058* (0.032)
Chi 2(4)	7.16	5.42	0.95	10.33**	5.64	8.34*	3.55	6.12
Number of obs.	385	495	230	650	473	407	211	669

Note: Probit model. \*\*\* (\*\*, \*) indicates statistical significance at the 1 (5, 10) percent level.