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STUCK IN THE PAST?
INFORMATION PROCESSING INDIVIDUAL EXPERIENCES AND EXPECTATIONS

by

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Abstract

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 and less engaged individuals. Individuals who are more informed or engaged about the economy are unaffected by their prior experiences.

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Stuck In The Past? Information Processing, Individual Experience, and Expectations

I. Introduction

> Both expectations and memories are more than mere images founded on previous experience.
>
> - Samuel Alexander

How do we use experience to form expectations? A person who witnesses a car wreck at an intersection will likely be more cautious when approaching that intersection in the future. A person who actually experiences a car wreck is even more likely to exercise increased caution. But what happens when the situation changes after a traffic light is installed? Is the prior experience still considered relevant? Are some people stuck in the past despite a very different present?

We provide evidence on the effect of an earlier banking crisis on future expectations using unique survey data from Bulgaria. Bulgaria's banking system imploded in 1996, midway through its transition from communism. Many Bulgarians found their bank deposits, once they were again able to access them, severely eroded. 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 peoples' experiences during the crisis in 1996. With this information we test how prior experiences with a banking crisis condition expectations of another crisis.

As in the example of the installation of a traffic light, the environment of Bulgaria in 2008 was very different than it had been at the time of the 1996 crisis. The Bulgarian economy had experienced nearly a decade of prolonged, stable growth with relatively low inflation. The banking sector had been privatized and was largely foreign owned. Official deposit insurance

had been instituted, banking supervision reformed and a currency board established. Still, we find people who had lost money in 1996 are significantly more likely to expect a new crisis. However, this response is not uniform; there is heterogeneity among the population. Prior experiences are more influential on the expectations of those individuals who we term *less informed* about the economy. In contrast, the expectations of *more informed* people are unaffected by their experiences during the 1996 crisis.

These results have important implications for policymakers and financiers trying to reestablish trust following a costly banking crisis. For part of the population, successful reform efforts can facilitate the fading of past negative experiences into the background where they no longer affect expectations. However, for another part of the population the past continues to loom large. Because this second group is less informed or engaged with the economy, efforts to convince them of changed circumstances may have little success.[1] For them, negative experiences can affect expectations and therefore, behavior, for a prolonged time. And, if the group is of sufficient size and influence, the lingering effects of past negative experiences may impose a continuing drag on economic activity.

The rest of the paper is structured as follows. The next section includes the basic theoretical construct of our question on expectations formation and the influence of past events. We then describe the survey instrument before leading into the regression model and the estimation results. Finally we offer some concluding comments. An appendix presents brief

[1] An advertising leaflet by a Bulgarian bank near the time of the survey illustrates the problem of incomplete trust facing banks. The top half of the page features photos of a jar filled with sugar, a mattress, a pair of shoes, a shelf with books, and several other places where people usually hide cash. The message below the photos reads: "If we know where you keep the money, they also know"; "they" are, of course, the thieves. The implicit message is to deposit the money in the bank instead. This campaign would not be necessary if people believed that bank deposits were risk free.

background notes on Bulgaria's banking and currency crisis in 1996 as well as information on the improved economic performance since that time.

II. The Formation of Expectations

Economic theory has long recognized that past events can affect future expectations, for example, Cagan (1965) modeled the expectations of the future rate of loss on deposits as depending on some average of the past experience of losses. We extend this type of expectations modeling by proposing that individual experiences of a past event may differ causing them to vary in their influence.[2] When an individual is directly and negatively affected by a past event, it is reasonable to expect the memory of that event will be stronger and that this past event will be weighted more heavily in forming expectations. For example, a person who had recently been involved in a traffic accident at a particular intersection will likely have a higher assessment of the danger of this intersection, and be more cautious, than another person who had merely read about the accident in a newspaper account.[3]

Malmendier and Nagel (2011) provide empirical evidence of the impact of individual past experience on behavior. They are interested in how experience with the stock market affects risk taking. With individual survey data, but without knowledge of the history of an individual's historical stock market returns, they separate individuals into cohorts and compute each cohort's

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[2] Akerloff and Schiller (2009), in discussing the causes of the run on banks of the Great Depression, describe stories of earlier bank runs forming a "social memory" among the population. This social memory facilitated the development of an instinct to avoid losses when "something did not look right" by withdrawing their funds. Here, rather than an indirect social memory, we focus on individual memories formed from direct experiences.

[3] An assumption that negative experiences affect behavior seems reasonable as it is also used in the psychology literature. For example, an interesting stream of research in experimental psychology examines the effects of planting false memories into subjects. Bernstein (2009) notes the basic premise: "It seemed natural to assume that if a person had a bad experience with some object, then that person might avoid that object later." One study shows that individuals are willing to pay less for a Disney Pluto souvenir after the implantation of a false memory of a negative experience as a child with the Pluto character at Disneyland (Berkowitz, et al, 2008).

shared experiences of overall stock market returns. They find that "experienced returns" shared by a cohort affects their risk taking, apparently through its impact on their expectations. They also find that the weighting of the experience of returns in a given year diminishes over time.

But, might we expect the weighting of past experience to diminish even more if the environment had changed? Returning to our example of a traffic accident, if a new traffic light were installed in the intersection, we would expect the individual who witnessed an accident to reduce his assessment of its danger. Even the actual victim of an accident might be expected to become less cautious. In our case, in Bulgaria, while many people suffered losses in the 1996 banking crisis, economic structures changed drastically in the following years. Past events such as the 1996 banking crisis may no longer have been perceived as relevant when forming expectations using all available information.[4]

To formalize this, we assume individuals form their expectations of the future using their understanding of both past events and current economic conditions, including any changes in economic structures (Sheffrin, 1996). With no information costs, individuals would use all available information. However, analyzing information is costly and the extent to which individuals search for and process information about changing economic structures depends on the marginal cost and perceived marginal gain of engaging in this activity. Feige and Pierce (1976) refer to this as "economically rational expectations." Similarly, Chris Sims (2003), in his concept of "rational inattention," theorizes that agents choose to update their information set only when the benefits are expected to outweigh the costs. The processing of new information, particularly of new economic structures, may be affected by a number of factors, including the cost of accessing information, levels of human capital that reflect an individual's

[4] A detailed explication of events surrounding the 1996-97 banking crisis in Bulgaria can be found in Appendix 1.

ability to process information, relative wealth that raises an individual's engagement with the economy, the expected gain from collecting information, etc. As individuals face different costs and expected gains, they may differ in the extent to which they gather and assess information. This gives rise to heterogeneity in terms of expectations formation that has been investigated by Feige and Pierce (1976), Haltiwanger and Waldman (1985), Branch (2004), Sethi and Franke (1995) and others.

Using a survey of Bulgarian households, we operationalize this idea of heterogeneity by dividing the survey respondents into two groups. *Less informed* people have less information as a result of either relatively higher costs or lower expected benefits which reduces their information processing activity (IPA). They depend more on past events, particularly past experience, in forming their expectations. *More informed* people face lower costs or are more motivated to collect and interpret information, i.e. have higher IPA. Having a better understanding of current economic conditions and structures, they discount past experiences in forming their expectations. Thus in our simple model, the *less informed* weigh past experiences more heavily than the *more informed* in their expectations formation.

A differential effect of the 1996 crisis on the expectations of different groups of people is not a foregone conclusion. It may be that some kind of social memory is stronger than individual experiences in determining the effect of past events on expectations. In this case individual experiences should have no differential effect. It could be the case that *more informed* individuals continue to form their expectations based on the past crisis. Despite recognition of a changed economic environment, the *more informed* could maintain the view that if a crisis happened before it is likely to happen again. Similarly, the *less informed* individuals might ignore or might have forgotten their experience from 12 years ago. Given these uncertainties,

whether and how the past crisis in Bulgaria continues to affect expectations across different groups of individuals is an empirical question.

III. Survey Data and Empirical Methodology

Our data are taken from a national survey of households carried out in May 2008. The survey polled 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 an established Bulgarian polling agency, Vitosha Research. It included questions on the banking system as well as a range of other questions on social and political topics.[5] The question about expectations of a 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?"*[6]

Table I reveals doubts among the respondents in the stability of the banking system. About 13 percent of the respondents believed that a banking crisis with depositors losing some of their savings was likely or very likely (categories 1 and 2) even at the 6 months horizon. Confidence

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[5] The survey documentations along with the data are available from the authors.

[6] The question goes to some length to detail the consequences of a banking crisis. This formulation was preferred by the polling agency in lieu of a shorter formulation, such as, "*In your opinion, how likely is it that the Bulgarian banking system will experience a crisis?"* to make sure that respondents interpreted the term banking crisis in the same way. This has been the preferred approach in national household and consumer surveys where a large number of the sampled individuals are not experts on economics.

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. At that 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 II shows that well over 40 percent of the respondents reported experiencing a loss with over 10% experiencing a large loss. The last column displays results from the same question posed in a follow up survey conducted in 2009. This latter survey took place in the midst of the world financial crisis. The fact that memories of loss were quantitatively similar despite very different circumstances at the time of the survey gives us confidence that memory bias is unlikely to be a problem in the responses to this question.

The dependent variable used in all estimations is based on the question about expectations of a banking crisis. It is constructed as a dummy variable equal to 1 for responses of high and very high likelihood of a crisis (categories 1 and 2), and zero otherwise. We call this variable CRISIS. We estimate the models using the probit methodology with Huber/White robust standard errors. To facilitate the interpretation of the results, we report the marginal

effects instead of the estimated probit coefficients so that we can discuss not only the direction of the effects but also their sizes.[7]

Our independent variable of primary interest is a measure of past experience and is based on the question about losses during the 1996 crisis. We construct a dummy variable that takes the value 1 for "some loss" and "lost a lot" and zero otherwise. We call this variable LOSS. We also report estimates where we distinguish between losses with different magnitude, i.e. between respondents who lost some money (SOME LOSS) and respondents who lost a lot (LOST A LOT). Hence, our empirical specification is as follows,

$$(1) \qquad \Pr(CRISIS_i) = \varphi(\alpha + \beta LOSS_i + \gamma X_i) + u_i$$

where i indexes the individual respondents to the survey, X_i is a set of control variables and u_i is a random term. We expect to find $\beta > 0$. Our benchmark estimation includes the following control variables: AGE in years; EDUCATION measured as a dummy variable taking the value 1 for respondents with university education, college or post-graduate education, and 0 otherwise[8]; INCOME reported in local currency; and FEMALE equal to 1 for female respondents and 0 otherwise. Appendix 1 summarizes all survey questions used in the paper and Appendix 2 provides summary statistics.

Our discussion in the theory section suggests that the expectations of respondents who engage in more information processing activity (IPA) to acquire knowledge about the economy

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[7] An ordered probit model that uses all categories of the crisis expectations instead of the dummy variable yields the same results. We opted to use a simpler dependent variable and probit to make the interpretation of the coefficients more straightforward.

[8] We obtain similar effects with alternative education variables separating holders of high school diplomas from those with university degrees and people with less than high school education.

will be affected less, if at all, by previous losses due to recognition of the changed environment. Therefore, we also estimate the following two equations:

$$(2) \qquad \Pr(CRISIS_i \mid IPA \leq IPA^*) = \varphi(\alpha_j + \beta_j LOSS_i + \gamma_j X_i) + u_i$$

$$(3) \qquad \Pr(CRISIS_i \mid IPA > IPA^*) = \varphi(\alpha_k + \beta_k LOSS_i + \gamma_k X_i) + u_i$$

where IPA > IPA* indicates an assessment that the returns from acquiring knowledge about the economy exceeds a given threshold and, respectively, IPA ≤ IPA* indicates that costs are relatively high compared to the gains from knowledge acquisition. Our hypotheses are $\beta_j > 0$ and $\beta_k = 0$. Estimating two separate equations as opposed to one equation with IPA interacted with LOSS allows for the possibility that the two subsamples are structurally different, yielding more reliable estimates.

We use three variables to distinguish between more informed and less informed individuals and to split the sample to separately estimate equations (2) and (3). First, we use EDUCATION to proxy for individuals' cost of staying informed about the economy. While more education does not necessarily imply better knowledge about the economy, more educated respondents are likely to face lower costs to collecting and analyzing information from the media and other information sources that provide such information. We estimate equation (3) for respondents with post-high school education and equation (2) for those with high school or less. Second, we use INCOME to proxy for peoples' motivation to stay informed. People with higher income might have greater savings and would therefore be more motivated to keep track of economic developments. We split the sample around the median income bracket and, again, estimate equations (2) and (3). Third, we use the answers to the following question:

"Inflation in Bulgaria has been below 15% for the past 5 years."

to construct the variable INFORMED which equals 1 for respondents who agreed or strongly agreed with that statement, and 0 otherwise. Respondents who agreed or strongly agreed are considered informed as the statement is factually correct. The survey results indicate that only a quarter of the respondents were informed about past inflation in the country, with the vast majority answering they could not give an answer. Again, we split the sample according to these responses and separately estimate equations (2) and (3).

Explanations of the variables as well as their statistical properties can be found in Appendices 2 and 3. Note that the overlap of the sub samples across the different variables was large, but substantial variation remained. For example, comparing the more informed as proxied by inflation awareness (255) with the more informed as proxied by higher education (254), only 75 were common.

IV. Empirical Results

The estimations in Table III show that losses during the 1996 crisis affect expectations.[9] The LOSS variable is positive and statistically significant at all time horizons. People who reported a loss in 1996 were 6 percentage points more likely to expect a new crisis in the next six months compared to people who had no losses, 8 percent more likely during the next 1 year and 11 percent more likely in the next five years. The effect of losses on expectations is even

[9] Mudd, et al (2010) reported similar results.

stronger if we differentiate between people who experienced some loss and those who experienced a large loss. At the five year horizon (last column of Table III) respondents who lost a large amount in 1996 were 23 percentage points more likely to expect a crisis in the next five years compared to respondents who did not lose anything. They were also 16 percentage points more likely to expect a crisis compared to respondents who lost a smaller amount.[10] Therefore, the magnitude of the loss makes a substantial difference. This underlines the importance of personal experiences: expectations are influenced by the extent to which an individual was affected by the crisis, and not simply by the awareness that a crisis happened. Looking at the demographic variables, age, education, and gender have no statistically significant effects on expectations. Only income is statistically significant at the six months horizon, with higher income associated with a lower likelihood of a crisis, but the effect disappears over longer time horizons.

More Informed and Less Informed Individuals

Next, we estimate equations (2) and (3) after splitting the sample into two groups using the responses to the question about past inflation, then income and then education. The results, reported in Table IV indicate that experiences of a loss in the 1996 crisis do not affect the expectations of the *more informed* respondents using any of the three criteria associated with information processing activity. In contrast, for the *less informed* groups, the prior experience of a loss enters significantly in the regressions explaining the expectations whether the sample split is from education, income or responses to the question on inflation. The results are consistent with our hypothesis that *more informed* actors process information about changing structures and

[10] The difference 0.234 – 0.078 = 0.156 is statistically significant.

adapt their expectations accordingly while expectations of relatively *less informed* actors are more likely to rely on past, particularly negative, experiences.[11] The results are robust to changes in the sample dividing point in both directions for both education and income.

In order to check that the lack of a significant coefficient across the more informed groups was due to low power from a small sample size, we also ran regressions on the full sample with interaction terms. Table V summarizes the results. Only the interaction of loss and income produced a significantly measured coefficient and this held for all three time horizons of expectations of a banking crisis: 6 months, 1 year and 5 years.

V. Concluding Remarks

The question of long-term negative effects of a crisis has received very little attention. In one study, IADB, 2004, the authors find that a banking crisis reduces *long-term* economic growth by about 1 percentage point. While the 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, producing a drag on economic growth for a number of years after the crisis. Based on the IADB study and our analysis using the Bulgarian survey data, we believe that investigating the long-term consequences of banking crises is a promising line of research.

However, our results also indicate that policy makers have an opportunity to influence the long term effects of a banking crisis. Structural reforms to change the economy's operations can

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[11] Using three different variables to separate between more and less informed individuals provides a useful robustness test. It is conceivable that people who lost money in 1996 feel more motivated to stay informed about the economy. Then, the crisis would affect not only expectations but also the variable INFORMED. Losing money during the crisis might also have affected some people's long-term income level. These hypotheses are not supported by our data - people who lost money in 1996 are not more likely to be informed about the economy and don't have lower (or higher) incomes. Yet, using education as an additional variable gives us further confidence in the results as the crisis is unlikely to affect peoples' long-term education levels.

reduce the persistent effect of a past crisis on expectations. But, as our results show, this effect may be largely limited to a *more informed* segment of the population who can recognize that the drivers of earlier crises are no longer a major issue. Efforts of policymakers to encourage individuals to adapt their expectations in response to an improved economic environment following a crisis face a significant challenge and should take into account different segments of the population. The most likely to change their expectations are those who did not experience a personal loss and those who are relatively well informed. Efforts to decrease the costs of becoming informed, for example through public information campaigns, should accompany economic reform to increase that portion of the population who recognize changed economic circumstances and the lower relevance of past experiences. This could lead to less backward-looking expectations and beneficial changes in behavior.

Nonetheless, even if economic reform affects the expectations of only a limited part of the population, policy makers can also try to limit the influence of the *less informed* actors with efforts to reduce strategic complementarities. As Haltiwanger and Waldman (1985) show, when there are strategic complementarities, *less informed* people can have a more than proportional effect on economic outcomes, lengthening the persistence of a shock. Banking crises are an example of a situation with such strategic complementarities. *More informed* people will pull their money from banking institutions in a bank run based on a rumor of insolvency even if they know that the bank is solvent because it is their interest to behave like the *less informed people*. If *less informed people* act on unfounded rumors, they can cause a liquidity crisis of a bank and force it into bankruptcy. To avoid being left last in line of a failing bank, *more informed* people will act on an unfounded rumor, too. Deposit insurance breaks the complementarity, reducing the persistence of a negative shock. *More informed* investors who are confident in the deposit

insurance choose to leave their money in the bank lessening the liquidity shock of withdrawals from *less informed* people.

The Bulgarian authorities implemented a deposit insurance scheme during the banking crisis of 1996. However, given the variance in information sets indicated in the survey responses, how well understood such an insurance scheme is among the population must be questioned. For any such policy to be effective either in changing expectations or in helping to break strategic complementarities, well-targeted public information campaigns may be necessary. Even so, the Bulgarian deposit insurance does not have a good track record as it did not prevent losses in 1996. To help fully accomplish the goals of any such policy reform, most importantly, actual losses have to be limited.

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Table 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?"
(Percent respondents in each category)

	2008 Survey		
	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

Table II
"Did you or members of your household lose money during the 1996 crisis?"
(Percent respondents in each category)

	2008 Survey	2009 Survey
Lost a large amount	11.1	14.5
Lost some amount	31.1	27.1
We did not lose anything	48.8	44.7
Don't know/No Answer	9.0	13.7
Total	100.0	100.0

Table III
Losses during a banking crisis and expectations.
Dependent variable: 1 if respondent believes that a banking crisis is likely or very likely, 0 otherwise. Probit analysis.

	6 months	1 year	5 years	6 months	1 year	5 years
Loss	0.056**	0.080***	0.115***			
	(0.024)	(0.028)	(0.030)			
Some Loss				0.055**	0.077**	0.078**
				(0.028)	(0.033)	(0.035)
Lost a lot				0.074*	0.103**	0.234***
				(0.043)	(0.049)	(0.054)
Age	0.001	0.001	-0.001	0.001	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Income	-0.076**	-0.025	-0.023	-0.077**	-0.026	-0.024
	(0.033)	(0.026)	(0.028)	(0.033)	(0.027)	(0.028)
Higher Ed	0.042	0.054	0.032	0.042	0.054	0.031
	(0.031)	(0.035)	(0.037)	(0.031)	(0.035)	(0.037)
Female	-0.011	-0.038	-0.001	-0.011	-0.038	0.001
	(0.024)	(0.029)	(0.031)	(0.024)	(0.029)	(0.031)
Chi 2(5)	15.03***	14.01**	15.78***			
Chi 2(6)				15.11**	14.18**	24.11***
Obs.	805	805	805	805	805	805

Note: Robust standard errors in parentheses. ***(**,*) indicates statistical significance at the 1 (5, 10) percent level.

Table IV
The expectations of "more informed" and "less informed" respondents.
Dependent variable: 1 if respondent believes that banking crisis
is likely or very likely, 0 otherwise. One year horizon.
Probit analysis.

	Information about the economy		Income level		Higher Education	
	More informed	Less informed	Higher income	Lower income	More education	Less education
Loss	0.035 (0.057)	0.103*** (0.032)	0.026 (0.045)	0.115*** (0.036)	0.068 (0.061)	0.083*** (0.032)
Age	-0.001 (0.001)	0.001 (0.001)	0.003* (0.002)	0.001 (0.001)	0.002 (0.002)	0.001 (0.001)
Income	-0.077* (0.046)	-0.003 (0.036)	-0.086* (0.046)	0.072 (0.165)	-0.035 (0.048)	-0.018 (0.031)
Higher Ed	0.119* (0.068)	0.019 (0.040)	0.044 (0.049)	0.052 (0.050)		
Female	-0.054 (0.057)	-0.029 (0.034)	-0.011 (0.046)	-0.055 (0.038)	-0.055 (0.067)	-0.032 (0.032)
Chi 2(5)	5.82	12.82**	7.00	15.62***	4.81	8.39*
Obs.	218	587	331	474	194	611

Note: Robust standard errors in parentheses. ***(**,*) indicates statistical significance at the 1 (5, 10) percent level.

Table V
Heterogeneity in the impact of loss.
Interaction terms of loss with proxies for "more informed" and "less informed" respondents.
Dependent variable: 1 if respondent believes that banking crisis
is likely or very likely, 0 otherwise. Expectations horizon as indicated.
Probit analysis.

	Inflation Knowledge			Income			Higher Education		
	6 month (1)	1 year (2)	5 year (3)	6 month (4)	1 year (5)	5 year (6)	6 month (7)	1 year (8)	5 year (9)
Loss	0.055**	0.105***	0.127***	0.108***	0.141***	0.202***	0.054**	0.085***	0.114***
	(0.028)	(0.034)	(0.036)	(0.040)	(0.043)	(0.047)	(0.028)	(0.033)	(0.035)
Informed Proxy	-0.000	0.072	0.036	-0.001	0.011	0.018**	0.037	0.065	0.030
	(0.038)	(0.047)	(0.049)	(0.007)	(0.008)	(0.009)	(0.047)	(0.054)	(0.056)
Interaction Term	0.004	-0.067	-0.037	-0.102*	-0.110*	-0.160**	0.008	-0.017	0.003
	(0.055)	(0.051)	(0.064)	(0.062)	(0.060)	(0.066)	(0.057)	(0.062)	(0.071)
Chi 2(7)	15.93	16.68	16.63						
Chi 2(6)				16.44	17.65	22.93	15.95	14.26	16.07
Obs	805	805	805	805	805	805	805	805	805

Robust standard errors in parentheses. ***(**,*) indicates statistical significance at the 1 (5, 10) percent level. Informed Proxy is inflation awareness in columns 1, 2, and 3; income in columns 4, 5, and 6; higher education in columns 7, 8, and 9. Control variables are ln(income), age, higher education, and female, except in columns 4, 5, and 6 where ln(income) is reported.

APPENDIX 1: 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. Berlemann, Hristov, and Nenovsky (2002) detail how the crisis unfolded and the government response:

The financial crisis had been building for some time as Bulgaria was slow in reforming its real economy during the transition from socialism (see Berlemann, Hristov, and Nenovsky 2002, Dobrinsky 2000, and Koford and Tschoegl 1999). Both state-owned banks and many private banks channeled funds to inefficient state-owned enterprises the government considered too important to liquidate. Credits to these firms often served merely as stop-gap efforts either to cover losses or service existing loans. While the infusion of funds enabled them to continue to operate, eventually these firms could no longer 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 poorly managed and served primarily to generate funds for the business activities of their owners. Further adding to the difficulties of the banking sector, corruption and government interference in lending was widespread.

Following the crisis, the government embarked on massive structural reforms privatizing and liquidating loss-making state-owned enterprises. The government also withdrew from the

private credit market and privatized all state-owned banks, in most cases selling them to foreign banks. By the time of the survey in 2008, more than 90 percent of Bulgarian banks had been owned and operated by foreign banks for several years. The change in ownership and improved environment had led to substantial investment in banking services and generated a network of branch locations throughout the country. Various financial services such as mortgages, credit for small firms, a range of saving accounts, electronic payments, and personal and business lines of credit had been introduced. Further, prudential supervision and regulation had strengthened substantially. In addition, a transparent and fairly generous deposit insurance system had been implemented.

In the broader macroeconomic context, in 1997 Bulgaria introduced a currency board with a peg to the German mark and later to the euro. Within months, the new currency board lowered inflation to single digits. Economic growth also accelerated. Bulgaria experienced strong annual growth from the time it ended the largest structural reforms around 2000. At the time of the survey, there were no indications of economic slowdown or risks in the banking system. The percentage of loans considered "non-standard" was well below 5 percent. Entry into the EU and NATO provided assurance to foreign investors who poured in significant amount of funds.

Bulgaria continues to have a high level of corruption, weak governance, and a low level of income. Yet, objectively, the fundamental reasons for the 1996 banking crisis had been 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.

APPENDIX 2. Variables and survey questions used in the empirical analysis.

	Survey question	Definition of variable
CRISIS	*"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?"* *1 = "Very likely"* *...* *5 = "Very unlikely"*	1 for very likely and likely (answers 1 and 2), 0 otherwise
LOSS/ LOST_A_LOT/ LOST SOME/	*"Did you or members of your household lose money during the 1996 crisis?"* *1 = "We lost a large amount"* *2 = "We lost some money"* *3 = "We did not lose anything"*	1 if a respondent reported a loss (answers 1 and 2),0 otherwise/ 1 for large loss (answer 1), 0 otherwise/ 1 for lost some (answer 2), 0 otherwise/
HIGHER	*1 = "Elementary or no education"* *2 = "Primary"* *3 = "Secondary"* *4 = "College"* *5 = "Post-graduate degree"*	1 if college or post-graduate degree (answers 4 and 5), 0 otherwise
INCOME	2008 Survey: *Total household income from all sources: choose from income brackets staring at 0 leva, at 100 leva intervals:* *1 = "0 – 100 leva"* *2 = "101 – 200 leva"* *...* 2009 Survey: *How do you assess your financial situation?* *1 = "poor"* *...* *5 = "rich"*	2008 Survey: Income categories (monthly) reported by respondents, using the mid-value of each interval. 2009 Survey: 5 point scale ranging from "poor" (1) to "rich" (5).
AGE	*Age in years.*	Age in years.
FEMALE	*Male / female*	1 for female, 0 for male
RISK	*"Suppose that I give you 1000 leva. You can keep the money or you can choose to participate in a game. I will throw a coin. If "heads" you win 1500 leva, if "tails" you win 900 leva. Do you prefer to play the game or to keep the 1000 leva?"*	1 if prefers to play the game, 0 otherwise
WITHDRAW	*"Did you increase, decrease or leave unchanged the amount of money you keep on bank deposits during the last 12 months?"*	1 if respondent decreased deposits, 0 otherwise.
INCOME LOSS	*"During the last year did you experience any of the following?:A significant loss of household income"*	1 if yes, 0 otherwise.

APPENDIX 3. Summary statistics for 2008 Survey

	Crisis_6m	Crisis_ 12m	Crisis_5y	Lost a lot	Some loss	Higher	Income	Age	Female	Risk
Mean	0.13	0.19	0.22	0.11	0.34	0.25	559	51.89	0.59	0.28
St. deviation	0.33	0.39	0.41	0.31	0.47	0.43	516	16.21	0.49	0.45
Minimum	0	0	0	0	0	0	50	18	0	0
Maximum	1	1	1	1	1	1	5500	89	1	1
Correlations										
Crisis_6m	1.00									
Crisis_12m	0.70*	1.00								
Crisis_5y	0.45*	0.62*	1.00							
Lost a lot	0.05	0.06*	0.14*	1.00						
Some loss	0.05	0.06	0.03	-0.26*	1.00					
Higher	0.03	0.06	0.06*	0.03	0.06	1.00				
Income	-0.06*	0.01	0.04	0.02	0.01	0.27*	1.00			
Age	0.06	0.03	-0.01	0.05	0.03	-0.07*	-0.49*	1.00		
Female	0.00	-0.03	0.01	-0.03	0.01	0.05	-0.05	-0.06*	1.00	
Risk	-0.05	-0.05	-0.03	-0.02	0.03	0.14*	0.33*	-0.28*	-0.03	1.00

Note: * indicates statistical significance at the 5 percent level.

APPENDIX 3 (continued) Summary statistics for 2009 Survey

	Crisis_6m	Crisis_ 12m	Lost a lot	Some loss	Higher	Income	Age	Female	Risk	Deposit Withdraw	Income Loss
Mean	0.28	0.31	0.15	0.27	0.25	2.29	52.2	0.58	0.28	0.065	0.37
St. deviation	0.45	0.46	0.35	0.44	0.43	0.87	17.2	0.49	0.45	0.25	0.48
Minimum	0	0	0	0	0	1	18	0	0	0	0
Maximum	1	1	1	1	1	5	90	1	1	1	1
Correlations											
Crisis_6m	1.00										
Crisis_12m	0.77*	1.00									
Lost a lot	0.09*	0.07*	1.00								
Some loss	-0.04	-0.03	-0.25*	1.00							
Higher	0.03	0.04	0.00	0.13*	1.00						
Income	0.06*	0.10*	-0.054	0.14*	0.26*	1.00					
Age	-0.08*	-0.11*	0.02	0.03	-0.08*	-0.28*	1.00				
Female	-0.01	0.03	0.00	-0.04	0.15*	0.01	0.04	1.00			
Risk	0.03	0.07*	0.04	-0.01	0.05	0.15*	-0.32*	-0.13*	1.00		
Withdraw	-0.02	0.00	0.09*	0.07*	0.14*	0.11*	-0.09*	-0.04	0.10*	1.00	
Income Loss	0.06	0.10*	0.17*	0.056	0.01	-0.06*	-0.15*	-0.04	0.07*	0.09*	1.00

Note: * indicates statistical significance at the 5 percent level.