

How Do Depositors Respond to a Banking Crisis?

A Conjoint Approach

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Research Objective

Depositors have varying degree of familiarity with banking and deposit insurance

Finance professionals are presumably most “knowledgeable,” other depositor types may be less so

We want to know whether different depositor types would respond differently to news of a banking crisis

We bridge two research themes:

- 1 Research on heterogeneity in investor behavior: Agarwal et al. (2017), Bodnaruk and Simonov (2015), Cohn et al. (2017), Kirchler et al. (2018)
- 2 Research on individual depositors' decisions in a crisis: Iyer and Puri (2012), Iyer et al. (2016), Iyer et al. (2017), Martin et al. (2018)

Theme 1 does not include studies on personal banking decisions

Data used in Theme 2 would not allow us to distinguish among depositor types

We extend investor heterogeneity focus of Theme 1 to personal banking focus of Theme 2

Highlights of Our Study

- Focus on withdrawals at the outset of a **banking** crisis
- Conjoint analysis methodology to collect data
- Bank account profiles help investigate depositor response under different insurance schemes, not just when insured vs. uninsured
- Comparison of finance professionals ($N = 298$) vs. non-finance professionals ($N = 157$) vs. graduate students ($N = 96$)

Some implications of our results:

- Haircut size and pre-funding of deposit insurance matter
- Less “knowledgeable” depositors seem imperfectly informed about insurance and retreat even from fully insured deposits
- Finance professionals respond to relevant risks. Others respond also to immaterial “risks” or ignore relevant risks
- Behavioral idiosyncrasies are less evident in case of decisions to withdraw $> 50\%$ of deposit

Conjoint Analysis (CA)

CA is a survey based technique used to determine how people value different attributes of product or service. It is deployed in variety of settings

CA involves showing respondents hypothetical product profiles. Regressions help quantify preferences over product attributes

Advantages:

- Provides data that would be difficult to obtain in a field survey
- Less subject to retrospection and social desirability biases
- Internal validity of experiment and external validity of survey

Important Aspects of Survey Instrument

Depositor standpoint:

...use your experience to consider how you would respond as a depositor

Onset of a banking crisis:

...one of the larger banks in your country has just failed. This event raised the likelihood of financial difficulties for the bank in which you are a depositor

Key assumptions:

- There are no “too big to fail” banks
- Deposit insurance agency will not fail
- Failed banks will be closed promptly

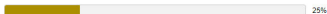
Account Profiles

Attribute	Bank Account Profile							
	1	2	3	4	5	6	7	8
<i>Information provided to respondents</i>								
Coverage limit	\$100,000	\$250,000	\$250,000	\$100,000	\$100,000	\$250,000	\$100,000	\$250,000
Deposit as % of coverage limit	75%	75%	75%	150%	100%	100%	75%	150%
Guaranteed payout	75%	100%	100%	100%	100%	75%	75%	75%
Bank contributes to insurance fund	Yes	No	Yes	No	Yes	No	No	Yes
Bank capital / Total assets	Above	Below	Above	Above	Below	Above	Below	Below

<i>Implied information</i>								
Deposit size	\$75,000	\$187,500	\$187,500	\$150,000	\$100,000	\$250,000	\$75,000	\$375,000
Fraction at risk	25%	0%	0%	33%	0%	25%	25%	33%

Online Survey Instrument: Profile Questions

Account Profile # 1 of 8



Please answer the two questions below about how you would react as a depositor, if your account is as follows ([downloadable reference card here](#)):

Coverage limit	\$100,000
Your deposit amount in % of coverage limit	75%
Guaranteed payout %	75%
Bank contributes to insurance fund	Yes
Bank capital / Total assets	Above average

On hearing about the shock to the banking system, I expect my bank to raise deposit interest rate by...

- ☐ 0% ☐ 0.5 ☐ 1.5 ☐ 2 ☐ 2.5
☐ 3 ☐ 3.5 ☐ 4 ☐ 4.5 ☐ 5
☐ 5.5% or higher

Given the increased risk of bank failure and expected interest rate change, what percentage of your deposit would you immediately withdraw?

- ☐ 0% ☐ 10 ☐ 20 ☐ 30 ☐ 40
☐ 50 ☐ 60 ☐ 70 ☐ 80 ☐ 90
☐ 100%

Estimation Approach

Equations to estimate:

$$\text{Interest rate change: } r_{ij} = p'_j \cdot \alpha_p + q'_i \cdot \alpha_q + u_{ri} + \epsilon_{ij} \quad (1)$$

$$\text{Withdrawal rate: } w_{ij} = \beta_r \cdot r_{ij} + p'_j \cdot \beta_p + q'_i \cdot \beta_q + u_{wi} + \eta_{ij} \quad (2)$$

Equations include profile attributes (p_j), respondent characteristics (q_i), unobserved respondent effects (u 's), error terms

We estimate two specifications per equation:

- Magnitudes of an effect are identical across depositor types
- Magnitudes can differ across depositor types

ML estimation to account for “interval” responses

Estimation Results for Withdrawal Rate (Excerpt)

Variable	Full sample	Finance pros.	Non-finance pros.	Students
Constant	25.11*** (5.98)	33.11*** (8.77)	15.03 (10.67)	12.11 (13.61)
Expected interest rate change	9.629*** (0.60)	11.81*** (0.91)	7.526*** (1.15)	8.185*** (1.09)
Deposit size (in \$100K)	0.890 (0.63)	0.530 (0.86)	0.887 (1.20)	2.023 (1.48)
Fraction at risk	44.61*** (7.11)	27.11*** (9.56)	69.54*** (13.88)	60.42*** (16.27)
Insurance fund	-14.09*** (1.23)	-14.38*** (1.67)	-17.29*** (2.35)	-7.683*** (2.84)
Low bank capital	2.660 (2.08)	-2.121 (2.81)	11.61*** (4.07)	4.843 (4.75)
Fraction at risk \times Low bank capital	63.24*** (9.59)	82.88*** (12.95)	41.71** (18.51)	32.35 (22.10)

Note: Estimated effects of respondent characteristics are omitted

Qualitative Summary of Results

- Finance professionals exhibit sophisticated behavior: their response to crisis primarily reflects combined effect of deposit insurance coverage and bank capital
- Non-finance professionals are more likely to withdraw fully insured deposits
- Graduate students care only about insurance coverage and are less concerned about pre-funding and bank capital

Appendix

Deposits are largest funding source for commercial banks

But they can be an unstable source: uninsured depositors can run in a crisis (Diamond and Dybvig, 1983; Goldstein and Pauzner, 2005)

Crisis response of finance professionals *vis-a-vis* other depositor types is theoretically ambiguous:

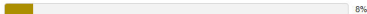
- Better informed depositors could respond more quickly
- Depositors with more banking experience might panic less

Layout of Online Survey Instrument

- (1) Survey purpose and structure
- (2) Assumptions; definitions of attributes of bank account profiles
- (3)–(10) Presentation of one profile at a time, followed by questions to elicit interest rate expectations and intended withdrawal rates
- (11) Questions about respondent characteristics: age, gender, wealth, risk tolerance, time preference, existing bank relationships

Online Survey Instrument: Purpose and Structure

Deposit Insurance Survey



Please accept our sincere thanks for helping us in this research effort. *Its purpose is to better understand a potential role of deposit insurance in preventing bank runs.* Your insight as a financial professional is very important. Your response will remain anonymous and we will use the data for statistical purposes only. The entire exercise should take approximately 15 minutes.

This study has two stages:

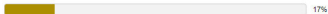
- 1) In the first stage, consider yourself a bank depositor in a hypothetical country. The banks in this country are not too big to fail. Your deposit is insured against loss in the event of a possible bank failure. The specific characteristics of the insurance are described on the following page. You will be asked to consider how you would respond to your bank possibly failing, given certain profiles of the bank and your insured account.
- 2) In the second stage, you will be asked to describe your actual situation.

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Online Survey Instrument: Assumptions



1. INSTRUCTIONS: This survey has two sections. In the first section, use your experience to consider how you would respond as a depositor in a **hypothetical bank**. Assume that one of the larger banks in your country has just failed. This event has raised the likelihood of financial difficulties for the bank in which you are a depositor. You will be presented with a series of 8 hypothetical scenarios (in the form of tables). Please evaluate EACH scenario by focusing on the role of deposit insurance. Then answer the TWO questions about how you would react as a depositor.

In all of the scenarios, assume that:

- Prices will remain stable for at least one year
- Taxes are not a relevant consideration
- You have no deposits at another bank
- Your bank is not considered "too big to fail"
- Your country's deposit insurance agency will not fail
- Any failed bank would be closed promptly
- Your bank has no direct government ownership

The account profiles that we will show you are differentiated along these characteristics ([you can access these as a downloadable PDF reference card on subsequent pages of the survey](#)):

Coverage limit: Maximum amount that you can claim from the deposit insurer if your bank fails (two options: \$100,000 or \$250,000)


Your deposit amount: The size of your deposit specified as a percentage of the coverage limit (three options: 75%, 100%, or 150% of the coverage limit)

Guaranteed payout %: Percentage of your deposit amount (up to coverage limit) that is guaranteed to be paid out if your bank fails (two options: 75%, 100%)

Bank contributes to insurance fund: Whether or not your bank contributes to an insurance fund to be used to pay back depositors of failed banks (yes or no)

Bank capital / Total assets: The level of your bank's capital (as a fraction of total assets) in comparison to the average level across comparable banks in your country (Above average or below average)

Online Survey Instrument: Respondent Characteristics

 92%

2. In the second section of the survey, we are interested in your personal circumstances. Your responses will remain anonymous.

What is your age?

☐ 20-30 years old ☐ 31-40 years old ☐ 41-50 years old ☐ More than 50 years old

Your gender?

☐ Male ☐ Female

How long have you had your primary bank account?

☐ 0-5 years ☐ 6-10 years ☐ More than 10 years

How many other relationships (loans, fiduciary, etc.) do you have with this bank?

☐ None ☐ 1 ☐ 2 ☐ 3 ☐ 4
☐ 5 or more

What is your estimated financial net worth (in US dollars)?

☐ 0-100,000 ☐ 100,000-500,000 ☐ 500,000-1 million ☐ 1-5 million ☐ Over 5 million

Online Survey Instrument: Risk & Time Preference Questions

Please answer the following hypothetical question as if the situation was real. You are offered the opportunity to buy a security that will immediately expire and pay you back, with equal probabilities, either a total of \$5,000 or nothing. What is the maximum amount that you are willing to pay for this security?

Please enter it in dollars:

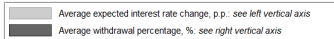
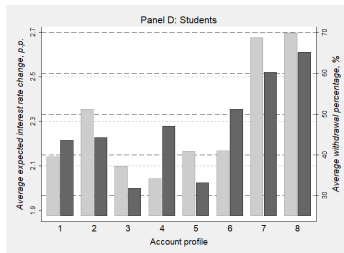
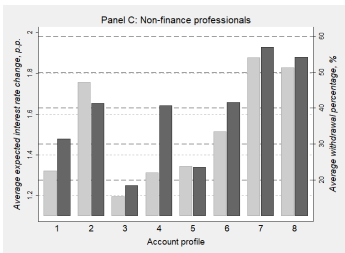
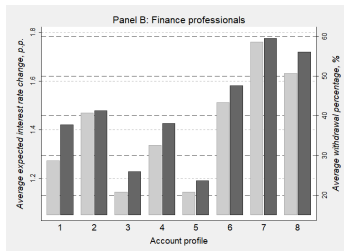
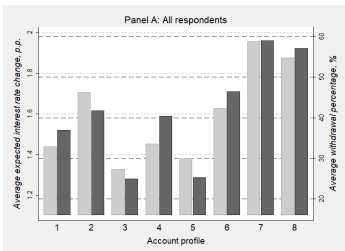
Please answer one more hypothetical question as if the situation was real. For purposes of this question, we ask you to assume that: (1) all gifts described here are certain to be paid in full and on time; (2) your wealth (except for the gifts here) will be the same next year as it is now; (3) the net rate of return on financial investments is zero.

Suppose you are offered a gift of \$1,000 payable in one year from today. Alternatively, you may specify any amount to be gifted to you right now. What is the minimum amount you would accept right now instead of the \$1,000 in one year?

Please enter it in dollars:

Please enter it in dollars:

Average Interest Rate and Withdrawal Responses by Profile



Respondent Variables: All Are Indicators

Age ≤ 30 : 1 if the respondent is no more than 30 years old

Female: 1 if the respondent is female

Wealthy: 1 if the respondent's financial net worth is \$100,000 or more

Risk tolerant: 1 if the respondent is willing to pay \$1,000 or more for a security offering equal-probability payoffs of \$5,000 and \$0

Impatient: 1 if the respondent is willing to accept \$900 or less now instead of \$1,000 one year from now

Short length: 1 if the respondent has had a primary bank account for no more than 5 years

Few relationships: 1 if the respondent has no more than one other relationship (loan, fiduciary, etc.) with the bank at which he or she has the primary bank account

Sample Characteristics

Sample proportions

Characteristic	Full sample	Finance pros.	Non-finance pros.	Students
Age ≤ 30	0.245	0.101	0.204	0.760
Female	0.365	0.305	0.446	0.417
Wealthy	0.711	0.859	0.726	0.229
Risk tolerant	0.450	0.453	0.452	0.438
Impatient	0.548	0.544	0.548	0.563
Short length	0.142	0.107	0.089	0.333
Few relationships	0.472	0.393	0.471	0.719
<i>N</i>	551	298	157	96

Finance and Non-finance Professionals

Finance professionals either work in investment division, provide financial planning solutions, or oversee financial market operations

Two typical descriptions of type of work performed:

A cross section of US-based accounting and finance professionals. The majority of the participants work either directly in the investment division or work closely with investment transactions on a daily basis. Experience levels generally range from 5 to 30 years

Our advisors provide holistic financial planning solutions directly to customers, and work across the spectrum of insurance, risk management, investments, and retirement planning

Non-finance professionals are not directly involved in financial decision making. They perform support tasks. *Examples:* marketing, communication, IT, HR, and legal specialists