Banking Crises Without Panics

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Introduction

- New historical data on bank equity returns (46 countries, 1870-2016)
  - Allow us to examine:
    - Banking crises with salient characteristics such as panics
    - Quieter periods of banking sector distress without panics
  - "Banking panics" (or "panics"): sudden, severe episodes when bank creditors refuse to roll over the short-term debt of a large part of the banking system

- Motivated by debates about fundamental nature of banking crises
  - **Panics view**: Dang, Gorton, and Holmstrom (2015), Bernanke (2018)
  - **Balance sheet view**: Calomiris and Mason (2003), Mian and Sufi (2014)

- **Are panics on the banking system necessary for severe banking crises?**
  - Or, can "quiet" periods of bank distress without panics translate into severe recessions?
  - If panics occur, do they precipitate the crisis, or occur at the final stage of the crisis?

Need for a new approach to identify crises

- Addressing these questions requires a large systematic sample of historical banking distress **with and without** panics.

- Existing literature identifies banking crises based on **narrative approaches**:
  - Bordo et al. (2001), Caprio & Klingebiel (2003), Demirgüç-Kunt & Detragiache (2005), Reinhart & Rogoff (2009), Schularick & Taylor (2012), Laeven & Valencia (2013)
    - Focus on salient events like panics, bank failures, or government interventions
    - Unable to detect quieter periods of banking sector distress

- Romer and Romer (2017): Narrative approaches are subjective, qualitative, and retrospective; contain "look-back" biases

- No precise definition of a "banking crisis" in the narrative accounts
  - "Know it when you see it" approach leads to wide disagreement across lists of crises

Disagreement about narrative banking crises

Narrative banking crises in Germany

Reinhart Rogoff	Schularick Taylor	Laeven Valencia	Bordo	Caprio Klingebiel	Demirguc-Kunt & Detragiache
0	1873				
1880	0				
1891	1891		0		
1901	1901		1901		
0	1907		0		
1925	0		0		
1929	1931		1931		
1977	0	0	0	late 1970s	
2008	2008	2008			

Legend:
YYYY = starting year of banking crisis
0 = "no crisis"
[blank] = outside of sample

Our approach: Bank equity returns

- This paper explores a different approach based on **bank equity returns**
  - "Large" decline in bank equity: proxies impaired solvency of banking system
  - Objective, real-time, and quantitative

- In many models, **bank equity** is an important state variable
  - Holmstrom & Tirole (1997), Gertler & Kiyotaki (2011)

- We find **bank equity returns** are *highly informative* about future macroeconomic consequences
  - Large declines predict large, persistent credit contractions and output gaps
  - Continuous measure of banking sector distress based on information incorporated by the equity market at the time
    - Capture banks' current losses but also anticipated future losses

Preview of results

Using new historical data on **bank equity index returns** for 46 countries, 1870-2016, we find:

1. Bank equity declines predict persistent credit contractions and output gaps

2. Evidence on **bank distress without panics:**
   - Bank equity declines *without* panics → substantial adverse future outcomes
   - *In contrast:* Panics without bank equity declines → no adverse future outcomes

3. Bank equity declines tend to precede panics and credit spread spikes
   - Bank losses present at early stages of crises
   - Panics – when they do happen – happen at the end as a key amplification mechanism

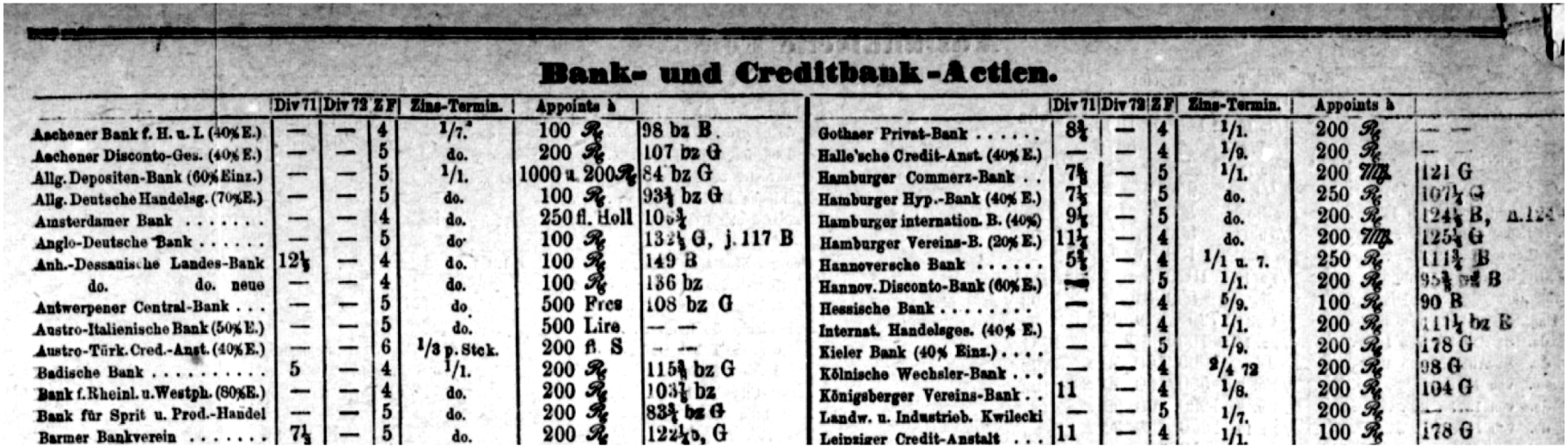
4. We use bank equity returns to uncover **forgotten historical banking crises** & create **a revised chronology** of historical banking crises based on systematic criteria.

Data: 46 countries, 1870-2016, annual

- **Abundance of historical bank equity data in 46 countries:**
  - Available from ~1870:
    - Developed countries
      - Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Luxembourg, New Zealand, Spain, Sweden, Switzerland, U.K., U.S.
    - Emerging economies
      - Argentina, Brazil, Chile, Egypt, Greece, Hong Kong, Hungary, India, Mexico, Imperial Russia, South Africa, Ottoman Turkey
  - Available from early 1900s:
    - Colombia, Czechoslovakia, Finland, Norway, Peru, Venezuela

- **Advantages:** Objective, theoretically motivated, real-time, quantitative
- **Drawbacks:** Measurement error, only covers public banks

New historical data sources



Bank- und Creditbank-Actien.

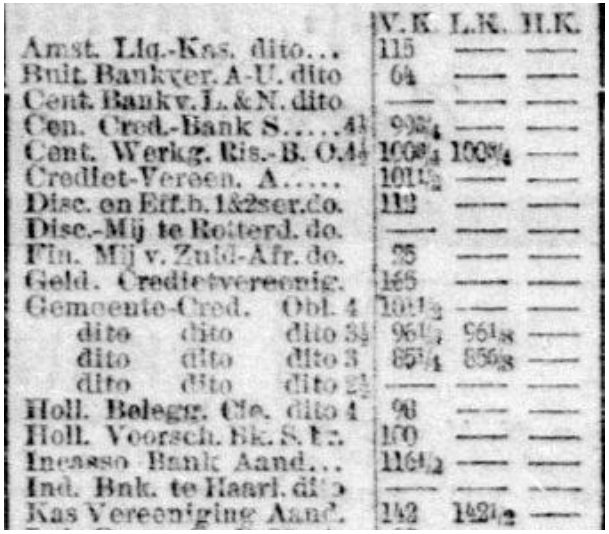
	Div 71	Div 72	Z F	Zins-Termin.	Appoints à	
Aachener Bank f. H. u. I. (40% E.)	—	—	4	1/7.	100 ℛ	98 bz B
Aachener Disconto-Ges. (40% E.)	—	—	5	do.	200 ℛ	107 bz G
Allg. Depositen-Bank (60% Einz.)	—	—	5	1/1.	1000 u. 200 ℛ	84 bz G
Allg. Deutsche Handelsg. (70% E.)	—	—	5	do.	100 ℛ	93¼ bz G
Amsterdamer Bank	—	—	4	do.	250 fl. Holl	106¾
Anglo-Deutsche Bank	—	—	5	do.	100 ℛ	132½ G, j. 117 B
Anh.-Dessauische Landes-Bank	12⅛	—	4	do.	100 ℛ	149 B
do. do. neue	—	—	4	do.	100 ℛ	136 bz
Antwerpener Central-Bank . . .	—	—	5	do.	500 Frcs	108 bz G
Austro-Italienische Bank (50% E.)	—	—	5	do.	500 Lire	— —
Austro-Türk. Cred.-Anst. (40% E.)	—	—	6	1/3 p. Stck.	200 fl. S	— —
Badische Bank	5	—	4	1/1.	200 ℛ	115¾ bz G
Bank f. Rheinl. u. Westph. (80% E.)	—	—	4	do.	200 ℛ	103⅛ bz
Bank für Sprit u. Prod.-Handel	—	—	5	do.	200 ℛ	83⅜ bz G
Barmer Bankverein	7½	—	5	do.	200 ℛ	122½ b, G

	Div 71	Div 72	Z F	Zins-Termin.	Appoints à	
Gothaer Privat-Bank	8⅛	—	4	1/1.	200 ℛ	— —
Halle'sche Credit-Anst. (40% E.)	—	—	4	1/9.	200 ℛ	— —
Hamburger Commerz-Bank . .	7⅛	—	5	1/1.	200 Mk	121 G
Hamburger Hyp.-Bank (40% E.)	7⅛	—	5	do.	250 ℛ	107½ G
Hamburger internation. B. (40%)	9⅛	—	5	do.	200 ℛ	124⅛ B, a. 125
Hamburger Vereins-B. (20% E.)	11⅛	—	4	do.	200 Mk	125½ G
Hannoversche Bank	5⅛	—	4	1/1 u. 7.	250 ℛ	111⅛ B
Hannov. Disconto-Bank (60% E.)	—	—	5	1/1.	200 ℛ	95⅜ bz B
Hessische Bank	—	—	4	5/9.	100 ℛ	90 B
Internat. Handelsges. (40% E.)	—	—	4	1/1.	200 ℛ	111½ bz B
Kieler Bank (40% Einz.)	—	—	5	1/9.	200 ℛ	178 G
Kölnische Wechsler-Bank . . .	—	—	4	2/4 72	200 ℛ	98 G
Königsberger Vereins-Bank . .	11	—	4	1/8.	200 ℛ	104 G
Landw. u. Industrieb. Kwilecki	—	—	5	1/7.	200 ℛ	— —
Leipziger Credit-Anstalt . . .	11	—	4	1/1.	100 ℛ	178 G

BORSE ITALIANE.

Corsi di chiusura del 28 dicembre 1904.

Valori	Roma	Milano	Genova	Firenze
Rend. It. 5 0/0 perc.	105 35	105 25	105 32 1/2	105 37
» f.m.	105 50	105 38	105 37 1/2	105 32 1/2
3 1/2 0/0 p.c.	103 42 1/2	— —	— —	103 35
» f.m.	103 35	103 32 1/2	103 37 1/2	103 30
Az. Banca d'It.	1132 —	1134 50	1133 50	— —
» Banca Comm.	529 —	528 50	528 —	— —
» Credito Ital.	611 —	611 —	612 —	— —
» Meridionali	756 —	756 —	758 —	758 —
» Mediterranee	— —	459 —	459 —	464 50
» Rubattino	— —	468 50	470 —	— —
» Terni	— —	1946 —	1949 —	— —
» Elba	— —	— —	— —	— —
» Savona	— —	— —	— —	— —
» Molini Alta It.	— —	— —	— —	— —
» Kridania	— —	— —	— —	— —
» Carburo Rom.	— —	— —	— —	— —



	V. K.	L. K.	H. K.
Amst. Liq.-Kas. dito...	115	—	—
Buit. Bankver. A-U. dito	64	—	—
Cent. Bankv. L. & N. dito	—	—	—
Cen. Cred.-Bank S.....4½	99¾	—	—
Cent. Werkg. Ris.-B. O.4½	100¾	100¾	—
Crediet-Vereen. A.....	101½	—	—
Disc. en Eff.b. 1&2ser.do.	112	—	—
Disc.-Mij te Rotterd. do.	—	—	—
Fin. Mij v. Zuid-Afr. do.	25	—	—
Geld. Crediet vereenig.	165	—	—
Gemeente-Cred. Obl. 4	101½	—	—
dito dito dito 3½	96½	96⅛	—
dito dito dito 3	85¾	85⅝	—
dito dito dito 2½	—	—	—
Holl. Belegg. Cie. dito 4	98	—	—
Holl. Voorsch. Bk. S. b..	100	—	—
Incasso Bank Aand...	116½	—	—
Ind. Bnk. te Haarl. dito	—	—	—
Kas Vereeniging Aand.	142	142½	—

1. BANK EQUITY DISTRESS AND MACROECONOMIC OUTCOMES

Local projection impulse responses

Response conditional on bank eq. returns

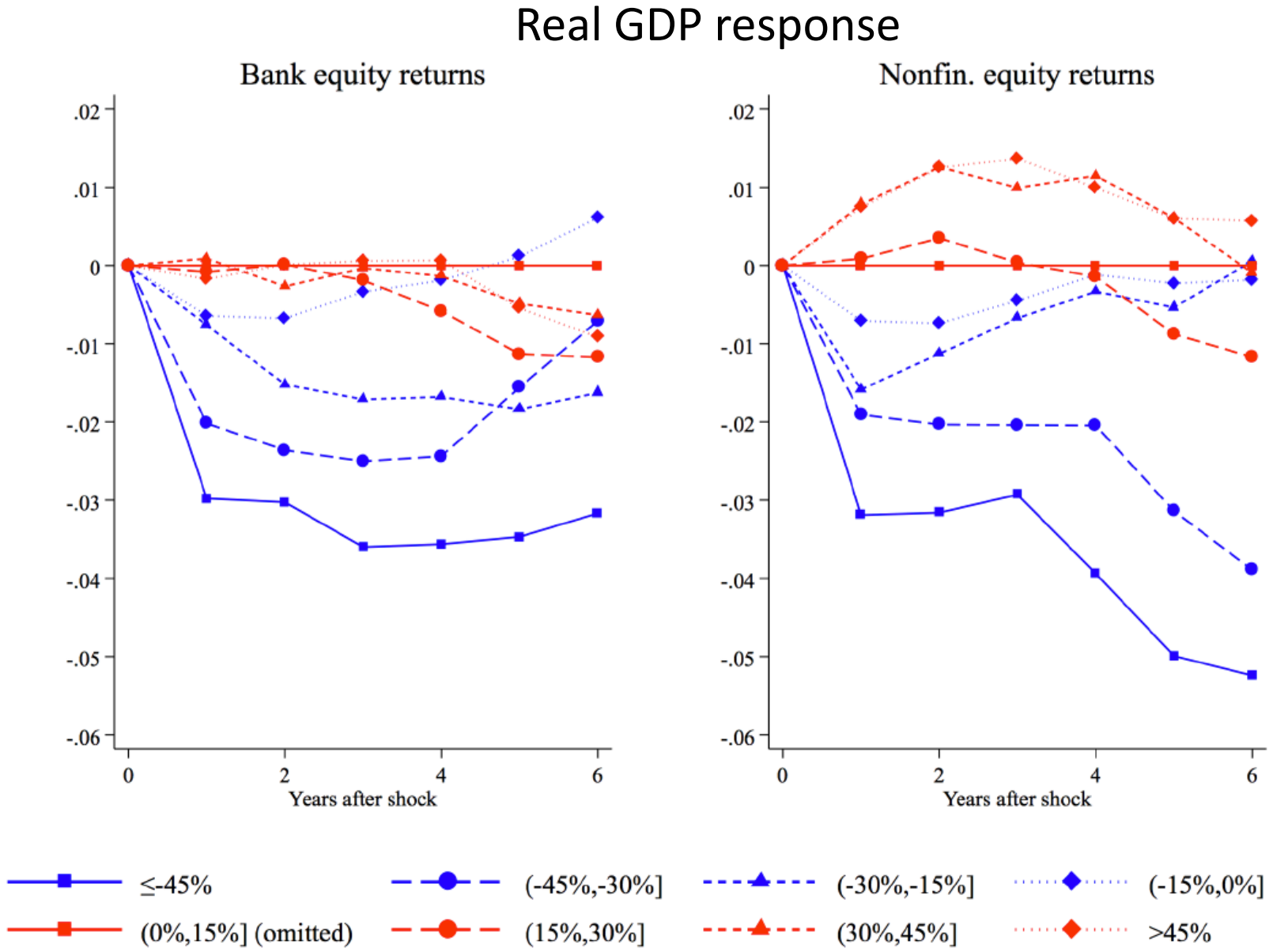
Response conditional on nonfin. eq. returns

$$\Delta_h y_{i,t+h} = \sum_j \left[\beta^h_{BE,j} RET^{Bank\ Eq,j}_{i,t} + \beta^h_{NE,j} RET^{Nonfin\ Eq,j}_{i,t}\right] + \Gamma^h * X^h_{i,t} + \alpha^h_i + \gamma^h_t + \epsilon^h_{it}$$

- $RET^{Bank\ Eq,j}$ = *indicators* whether bank eq. $returns_{i,t}$ fall into bins:
  - less than -45%, -45% to -30%, -30% to -15%, -15% to 0%, 0% to 15%, 15% to 30%, 30-45%, and greater than 45%.

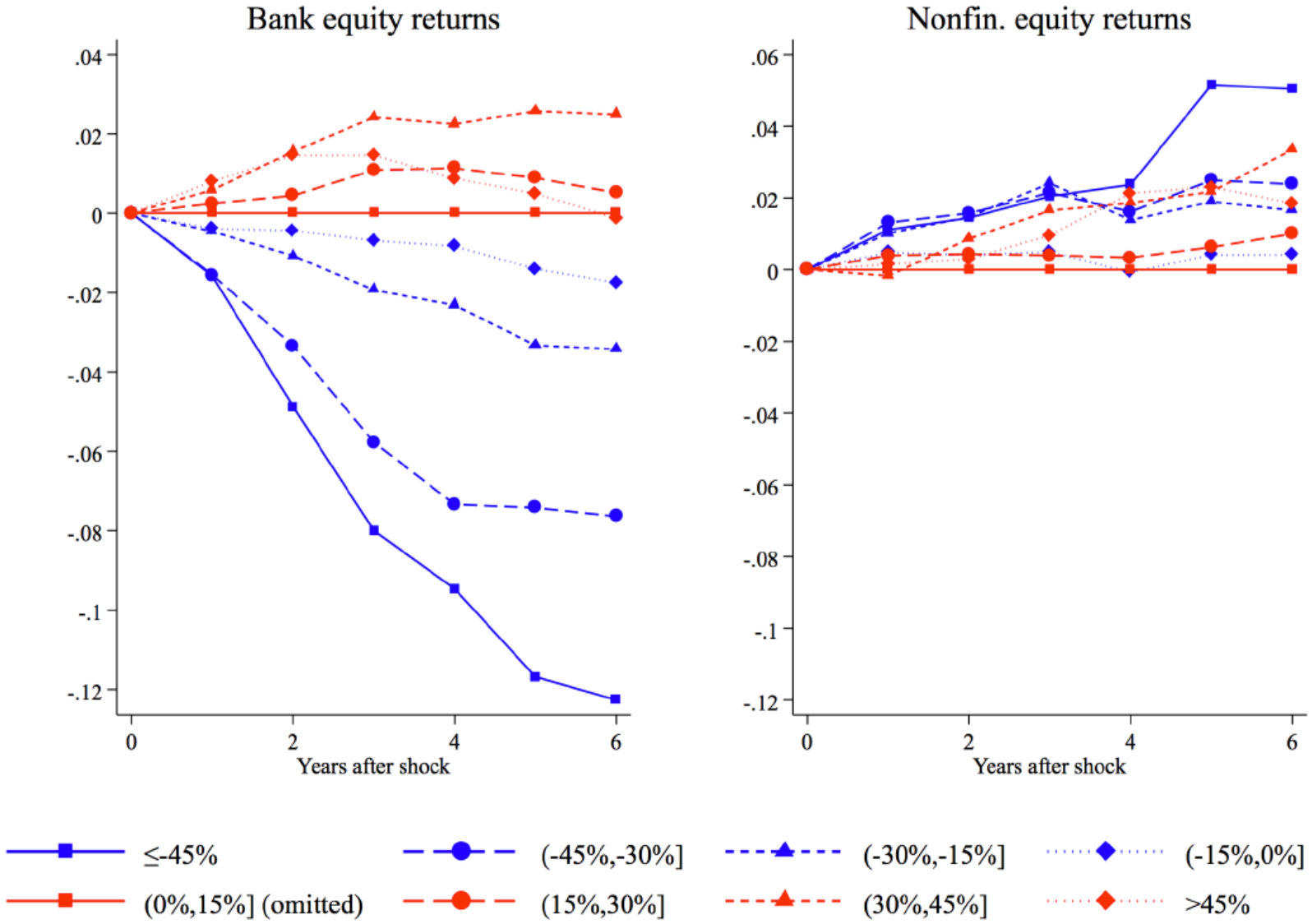
- $RET^{Nonfin\ Eq,j}$ = same but for nonfinancial equity index $returns_{i,t}$

Impulse responses to equity returns



Impulse responses to equity returns

Credit-to-GDP response



Robustness

The results are robust to:

1. Using other thresholds for bank and nonfinancial equity declines
   - Or using a continuous measure of bank and nonfinancial equity returns

2. Using a beta-adjusted or volatility-adjusted measure of equity declines

3. Replacing the nonfinancial equity returns with broad market equity returns

4. Subsamples, etc.

5. Holds even excluding all banking crises defined by traditional narrative approaches.

2. BANK DISTRESS WITHOUT PANICS

Non-panic bank distress

Are panics necessary for severe crises?

- Panics view
  - Panics are crucial turning points that are necessary for severe distress
    - e.g., Friedman and Schwartz (1963), Bernanke (2018)
- Balance sheet view
  - Distress among banks, households, or firms is the key driver
    - e.g., Calomiris and Mason (2003), Mian and Sufi (2011)

Our approach allows us to separate panic and non-panic distress:

1. **Mark all bank equity crashes (declines greater than -30%)**
2. **Separate "panic" from "non-panic" episodes using narrative evidence**

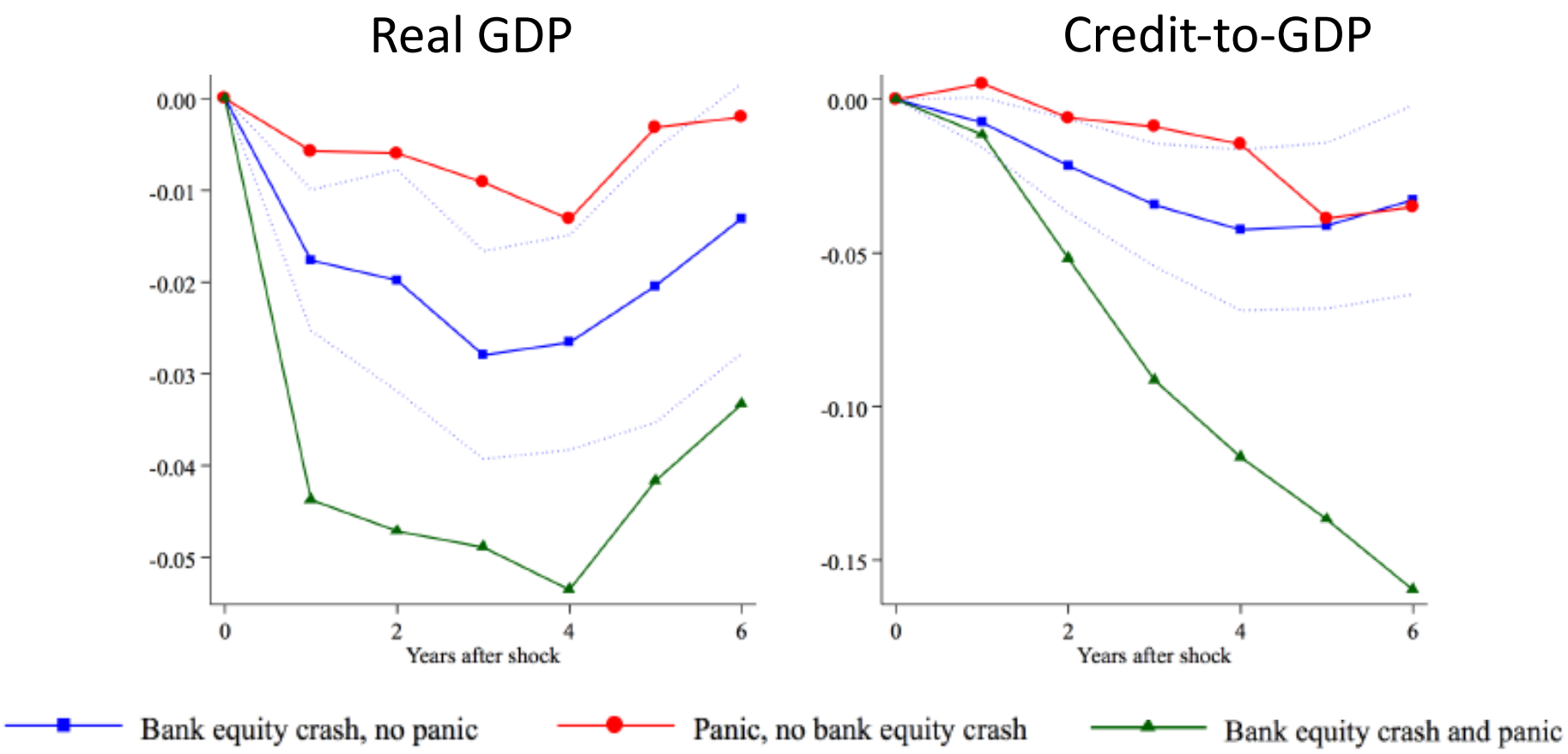
"Panic" is defined as containing any of the following:

a) Severe and sudden creditor withdrawals >1 of a country's largest banks or a number of smaller banks, that lead these banks to be on the verge of collapse.

b) Severe and sudden strains in interbank lending markets

c) Or, severe and sudden foreign-currency capital outflows from the banking sector

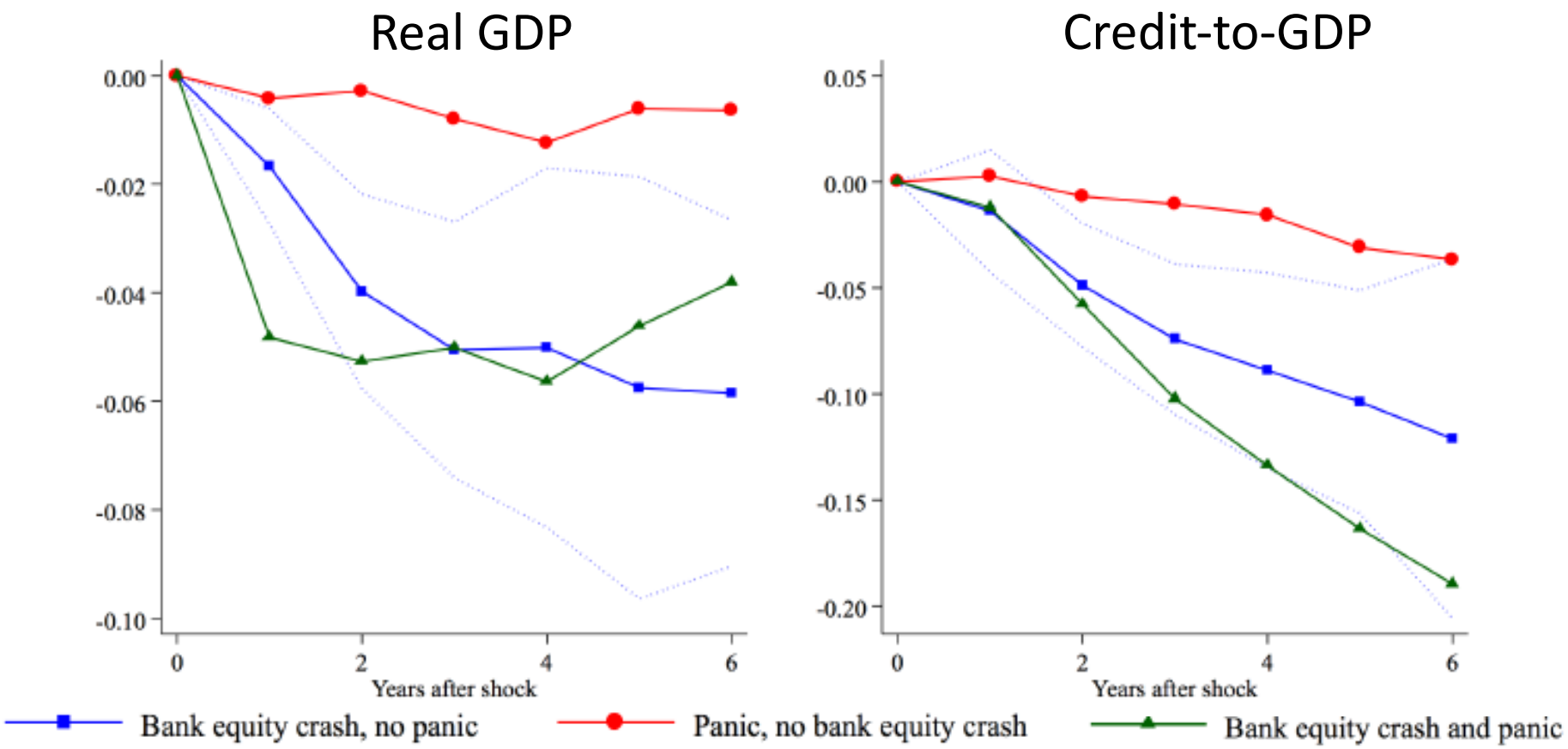
Impact of non-panic bank distress



$$\Delta_h y_{i,t+h} = \beta_1^h I_{i,crash} + \beta_2^h I_{i,panic} + \beta_3^h I_{i,crash} \times I_{i,panic} + \alpha_i^h + \gamma_t^h + \epsilon_{it}^h$$

Controlling (as usual) for nonfinancial equity declines & lags in dependent variables

Further conditioning on bank failures



$$\Delta_h y_{i,t+h} = \beta_1^h I_{i,crash} + \beta_2^h I_{i,panic} + \beta_3^h I_{i,crash} \times I_{i,panic} + \alpha_i^h + \gamma_t^h + \epsilon_{it}^h$$

Controlling (as usual) for nonfinancial equity declines & lags in dependent variables

Historical episodes of non-panic bank distress

- Initial stages of the Japan's banking crisis (1991-96)
- Canada in the Great Depression
- *1973-75:*

  Australia, Finland, France, Greece, Hong Kong, Ireland, Italy, Singapore, Switzerland, Turkey, and the U.S.
- Denmark in 1987-1992
- *2002-03:*

  Germany, Israel, Italy, Japan
- *2011-16:*

  Argentina, Hungary, India, Turkey
- *2016:* Italy

3. LARGE BANK EQUITY DECLINES PRECEDE PANICS AND CREDIT SPREAD SPIKES

Dynamics of banking crises

- Within a set of clear-cut banking crises, do expected bank losses (captured by bank equity declines) precede other indicators?
  - Or do these crises *start* with panics?

- **Monthly data** around banking crises
  - Countries:
    - 1870-2016: ~16 countries; ~1970-2016: the other 30 countries
  - Variables:
    - Bank equity total returns
    - Nonfinancial equity total returns
    - Bank & nonfinancial credit spreads
    - Panic month indicators (derived from narrative accounts)

Findings

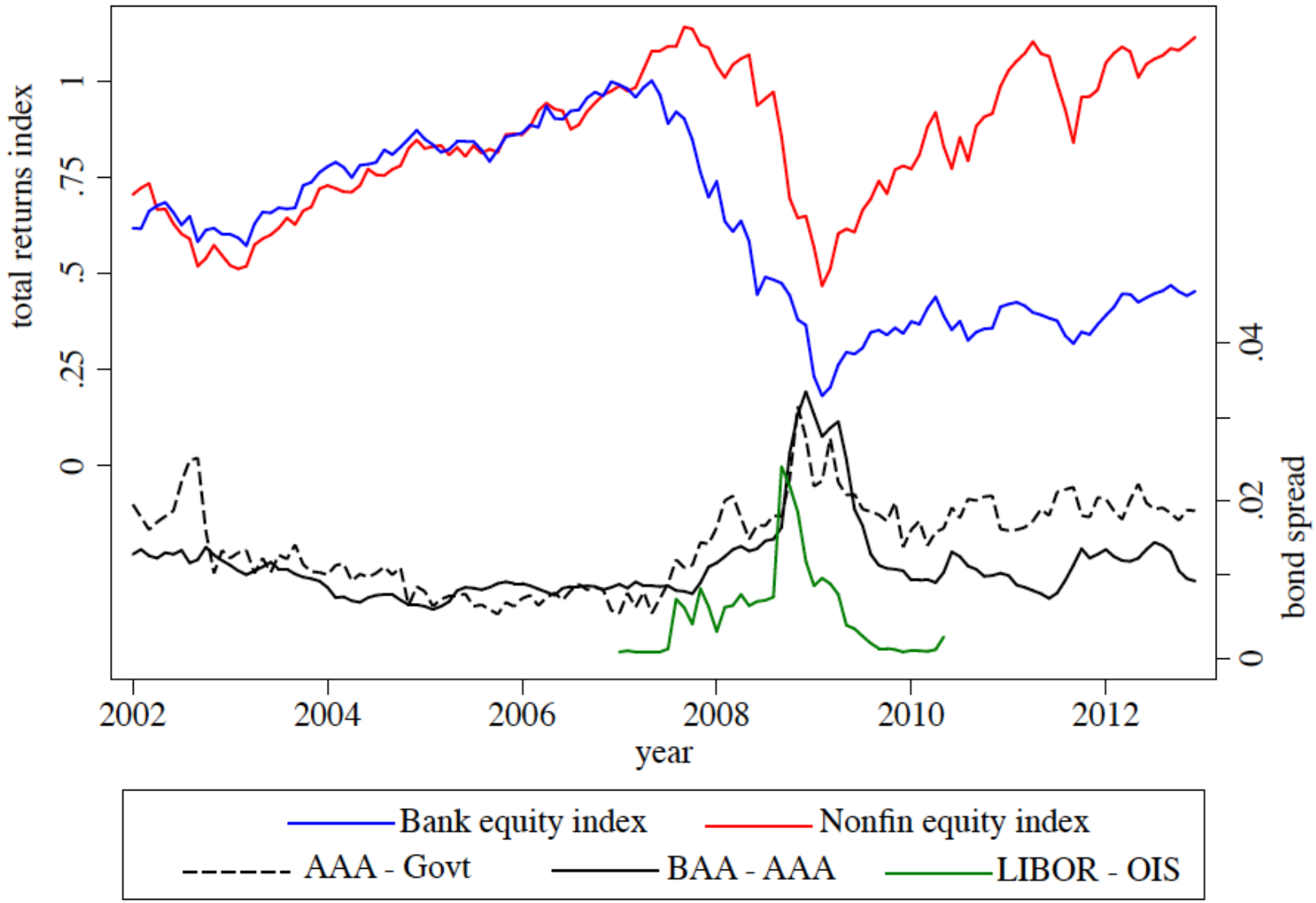
Bank equity declines **tend to precede**:

1. Panics and large credit spread increases
   - Suggesting that substantial bank losses are already present at the early stages of the crisis before the panic
   - Panics happen at the end, as a key amplification mechanism

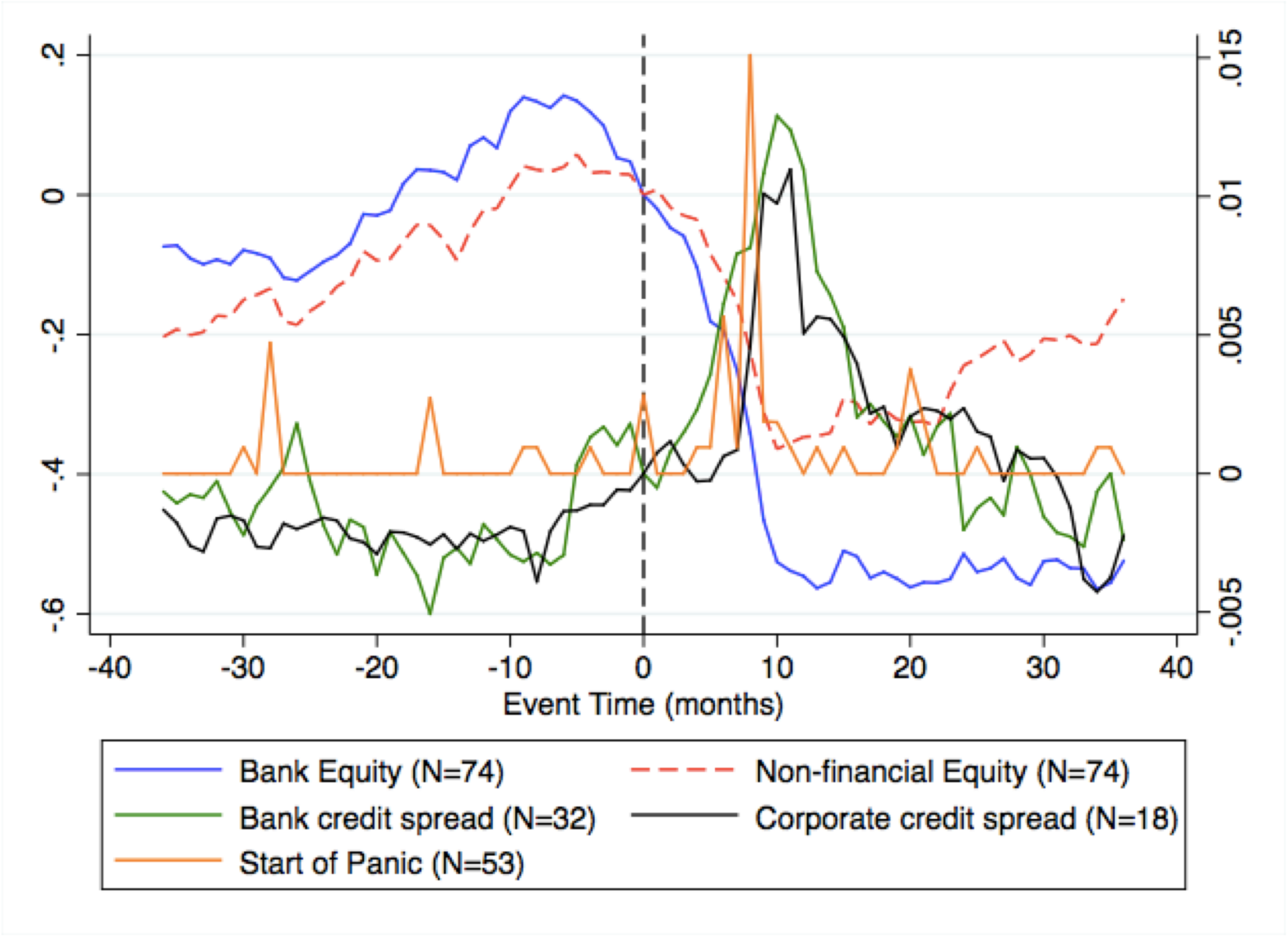
2. Nonfinancial equity declines (esp. in postwar & adv. economies)
   - Suggesting that narrow, concentrated losses start to appear in the banking sector first before appearing in the broader nonfinancial economy

The U.S. 2007-8 crisis

The U.S. around the 2007-8 crisis



Postwar sample



Bank equity vs. panics

Panel A: Bank equity crashes detect the crisis before panics, credit spread spikes, and narrative crisis dates

	Before panic	Before Reinhart-Rogoff start dates	Before earliest narrative start dates	Before 2% spike in bank credit spread	Before 1% spike in bank credit spread	Before 2% spike in corp credit spread	Before 1% spike in corp credit spread
Average (in months, signed)	7.46***	3.22**	2.94**	6.10***	3.37**	9.11***	4.11*
t-stat	4.92	2.52	2.43	5.87	1.97	6.65	1.75
N	93	94	102	40	41	19	19
Pos	69	39	33	32	23	16	12
Zero	5	33	53	4	2	1	0
Neg	19	22	16	4	16	2	7
Pos / (Pos + Neg)	78.4%***	63.9%**	67.3%**	88.89%***	59.0%	88.9%***	63.2%
p-value	0.000	0.020	0.011	0.000	0.168	0.001	0.180

4. CONSTRUCTING NEW CHRONOLOGIES OF BANKING CRISES

Previous approaches

1. *Narrative-based* approaches:
   - Bordo et al. (2001)
   - Reinhart & Rogoff (2009)
   - Schularick & Taylor (2012)

2. *Narrative-based* approaches focused on *policy responses*:
   - Caprio & Klingebiel (2003)
   - Demirguc-Kunt & Detragiache (2005)
   - Laeven & Valencia (2013)

Limitations of existing approaches

- Can overlook important but forgotten historical events
- They disagree with each other

Constructing new chronologies

- Obviously no single correct definition of a banking crisis
- Our goal is to illustrate **two possible constructions** of clear-cut crisis episodes based on systematic criteria emphasizing 1) *panics* and 2) *bank equity losses & failures*.
  - With the data we provide, one can likewise construct alternative lists of crises based on other dimensions

- Comparing our new chronology to the previous narrative-based chronologies:

1. Ours uncovers **newly-identified banking crises**
   - Episodes with large bank equity declines, plus systematically documented evidence of widespread bank failures and/or panic runs.
2. And removes some clear-cut **spurious banking crises**
   - Typos, historical errors, extremely minor events that did not involve bank losses or failures
     - Confirmed by small bank equity declines and no evidence other banking crisis characteristics

A new chronology of banking crises

Country	BVX starting year	Bank equity return	Panic banking crisis	Bank equity crisis
Argentina	1891	-0.307	1	1
	1914	-0.473	1	0
	1930	-0.819	1	0
	1934	-0.563	1	1
	1980		1	1
	1985		1	1
	1989		1	1
	1995	-0.305	1	1
	2000	-0.656	1	1
Australia	1893	-0.469	1	1
	1931	-0.230	1	0
	1989	-0.281	1	0
Austria	1873	-0.715	1	1
	1924	-0.344	0	1
	1931	-0.566	1	1
	2008	-0.673	1	1
	2011*	-0.509	0	1
Belgium	1870	-0.018	1	0
	1876*	-0.374	1	1
	1883	-0.139	1	0
	1914		1	1
	1929	-0.831	1	1
	1939	-0.511	1	1
	2008	-0.842	1	1
	2011*	-0.755	0	1
Brazil	1890	-0.275	1	0
	1900	0	1	0
	1914	-0.374	1	0
	1929	-0.182	1	0
	1985		1	1
	1990		1	0
	1994		1	1
Canada	1873	0	1	0
	1920	-0.426	1	1
	1982	-0.164	1	0
Chile	1878		1	1
	1898	-0.003	1	0
	1907		1	1
Chile (cont.)	1914		1	0
	1925		1	1
	1931*	-0.356	1	1
	1976	0	1	0
	1982	-0.837	1	1
Colombia	1931*	-0.675	1	0
	1982	-0.831	0	1
	1998	-0.813	1	1
Czech	1923		1	1
	1991		1	1
	1995	-0.904	1	1
Denmark	1877	-0.207	1	0
	1885	-0.043	1	0
	1907	-0.269	1	0
	1919	-0.347	1	1
	1992	-0.425	0	1
	2008	-0.739	1	1
	2011*	-0.444	0	1
Egypt	1907	-0.132	1	0
	1914	-0.407	1	0
	1931	-0.608	1	1
Finland	1900		1	1
	1921	-0.569	0	1
	1931	-0.252	1	0
	1990	-0.814	1	1
France	1871		1	0
	1882	-0.456	1	1
	1889	-0.106	1	0
	1914	-0.475	1	0
	1930	-0.571	1	1
	1937*	-0.435	1	0
	2008	-0.64	1	0
Germany	1874	-0.371	1	1
	1891	-0.23	1	0
	1901	-0.05	1	0
	1914		1	0
	1930	-0.489	1	1
	2008	-0.728	1	1

* Denotes newly-added banking crisis

Examples

- Newly-uncovered banking crises (**added**)
    1. Belgium, 1876
    2. Japan, 1922
    3. Portugal, 1876

- Spurious banking crises (**deleted**)
    1. Germany, 1977
    2. Netherlands, 1893 and 1897

Newly-uncovered banking crises

- Belgium in 1876. As reported by Grossman (2010): "the boom in Belgium after Franco-Prussian war led to the establishment of new banks. Several of these failed when the international crisis of 1873 arrived in Belgium. A few smaller banks went into receivership, and the larger Banque de Belgique, Banque de Bruxelles, and Banque Central Anversoise had to be re-organized. Durviaux (1947) calls this a serious crisis, while Chelpner (1943) suggests it may have been less serious."

- Japan in 1922. This episode is distinct from the Japanese banking crises of 1920 and 1923, the latter of which was triggered by the Great Kanto earthquake of 1923. Regarding 1922, Shizume (2012) writes: "Ishii Corporation, a lumber company engaged in speculative activities, went bankrupt at the end of February 1922, triggering bank runs in Kochi Prefecture (in south-western part of Japan) and Kansai region (Osaka, Kyoto and their environs). Then, from October through December 1922, bank runs spread far across the country, from Kyushu (the westernmost part of Japan) through Kanto (Tokyo and its environs in eastern Japan). In 1922, operations were suspended at 15 banks, either permanently or temporarily. The BOJ extended "special loans" to 20 banks from December 1922 to April 1923."

Concluding thoughts

1. Large bank equity declines provide useful information to study bank distress

   COVID crisis: nonfin stocks -4% from peak
   bank stocks -36% from peak

2. Banking panics are not “bolts from the blue”
   - **Long time window** between bank equity declines and panics give policy makers ample time to recapitalize banks