# Banking-Crisis Interventions, 1257-2023 The U.S. / SVB application

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\*bank stress frequency: combining Reinhart/Rogoff (2009), Schularick and Taylor (2012), Laeven and Valencia (2020), Baron/Verner/Xiong (2021), Metrick and Schmelzing (2021) banking crises or bank intervention chronologies, for eight country DM sample. Frequency=(no. of country years with stress event in any database)/(total no. of country years). Includes systemic and non-systemic events. GDP weights based on Schmelzing

# MOTIVATION, EXISTING DATA

- Extensive literature on banking crises chronologies
  - Bordo et al. (2001).
  - Reinhart & Rogoff (2009).
  - Laeven & Valencia (2013, 2020).
  - Baron, Verner, and Xiong (2021).
- General focus: systemic crises-year classifications from 1870.
- Nuanced intervention empirics concentrate on post-1980s, systemic resolution of banking crises: e.g. Laeven & Valencia, Igan et al. (2019, for post-2007). No consensus on classification.
- What we ARE trying to do
  - Detail bank crises policy responses to "canonical" (existing literature) and "candidate" (new) crises, using large (published and unpublished) source basis around the world. Monthly level.
  - Detailing perhaps the largest sample of global "would-be systemic crises".
  - Provide first standardized intervention classification framework, based on bank sector balance sheet.
  - Utilize recent advances in long-run GDP data to measure direct intervention sizes (fiscal, liquidity, guarantee) for hundreds of cases.
  - Provide new macro-history evidence on crises frequency intensity-adjusted and long-run historical patterns.
- What we are NOT trying to do
  - "Reclassifying" existing chronologies, dispute "start" or "peak" dates.
  - Judging intervention effectiveness over time.
  - Calculating secondary crises costs: wider output, bank-systemic, financial market costs.
  - Documenting interventions outside of banking/financial sector (i.e. GM 2008).



### **IDENTIFICATION PROCESS**

- 1. Investigation of all "canonical" crises in literature.
  - Primary, secondary sources detailing public/private responses. Associated balance sheet/Treasury files.
- 2. Wide investigation of financial, financial history primary and secondary literature, across space, time, and languages to identify "candidate" crises.
  - Micro-histories (e.g. Roover's "Medici Bank", Buist's "Hope & Co."), Institutional histories (e.g. Gilbart's *History of the Bank of Ireland*, Montaud's "Banca de Emision en Cuba").
  - Sector histories, general (financial) history including EM and DM (e.g. Bisschop's, Rise of the London Money Market, 1640-1826 (1910), Davidson's Geschichte von Florenz (1896)).
  - Pre-1945 literature, including Italian, Spanish, German sources (e.g. Ferrara's "Documenti per servire alla Storia de' Banchi Veneziani" (1871)).
  - Primary sources (e.g. Calendar of State Papers, Augsburg 'Fallianten collection', newspapers), here primarily DM.
  - Minimum criteria:
    - Intervention or balance sheet size of affected single institution during crisis event > 5m USD/GBP (from 1850), > 250,000 USD/GDP (from 1700), > 10,000 USD/GBP/RFL (from 1257).
      OR
    - Intervention affecting more than one institution at once, or cross-border policy response.
    - Where neither information is available judgment call (few cases overall).
  - Sample selection more prominent for pre-1700 era, but evidence on intervention sizes suggests robust selection.

### HISTORICAL SOURCES: 14 LANGUAGES, PRIMARY AND SECONDARY.

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"On the first attempt of the Dutch at Chatham, there was such astonishment that every one went to his goldsmith to recall his moneys, but they were all sent back empty handed, and the King was forced to issue a declaration, to save the goldsmiths from persecution; people's hearts are better settled, though still in the same uncertainty."

> CSP Charles II, Vol. CCVII, 113, June 29, 1667. Jas Thruston to Viscount Conway, Ragley.



Peruzzi, S.L., Storia del commercio e dei banchieri di Firenze in tutto il mondo (1868).

### DATABASE STRUCTURE

	Monthly/annual intervention date			Total no countries:	Details on interventio of <u>intervention size</u> , whereve	Details on intervention and <u>intervention size</u> , wherever available			Intervention associated with exist crises chronology ("canonical")				
			1		+					ł			
		<u>Cririr Code</u>	When	Whoro	Manetary/appernment respanse	What	Conduit	Flagr	Litoraturo	B/W/X, L/V, R/R or S/T?	lacama p.c. laval (2011 GKA)-MBS		
			PRE-MODERNERA, 1290-1693										
		BRL-1900	Sop-1900	Brazil	<u>GBP 900,000 emergency la</u> an and restructuring of Banco da Republica amid runz, includingswap of bank debt with Trearury noter (ownership remains mixed public- private).	AHLA, RES	0	0	Roinhart/Roqoff; Mottonhoim 2010, chaptor 3.	B/B	874		
		GER-1901	Jun-1901	Gormany	Cririr at Pruzzian and Pfandbrief banks. Private emergency help for Pomeranian Mortgage Bank from Deutrche Bank and Darmrtaedter Bank; Pruzzian mortgage banks provide 15M Mark aid to Preuzzirche Hypothekenbank and Deutrche	BBLA	0	PRI-PRI	Kritzler 1903, 4ff.; Financial Timer, June 11, 1902; Bopp 1954; Reinhart/Roqoff	B/V/X;R/R; S/T	4576		
		JP-1901	Apr-1901	Japan	Wave of failures in Osaka and Central/Southern provinces, including run on Yokohama Specie. Suarion by government to encourage mergers among smaller banks; unspecified "assistance" from Bank of Japan to banks.	othor	0	PRI-PRI (partly)	Financial Timer, April 27, 1901; Patrick 1999; Reinhart/Regoff	B/B	2162		
		DK-1902	1902	Donmark	Abildgron et al (2011, 6) and others do not report interventions.	NO/I	0	0	Roinhart/Regoff	B/B	5007		
Crisis start	٢	RUS-1905	1905	Ruzia	Amid rovalutionary uphoaval, run an Savingr Bankr. Gavornmont izsuor ardor limiting qald uithdrauair far all fundr at Stato Bank and branchor.	SBH	0	0	Bornatzky 1928, 349.		1935		
		NOR-1905	Aug-1905	Nerway	Dissolution docision with Swoden leads tospike in uncertainty: "fairly large cash withdrawals at banksbanks had to resort to loans from Norges Bank".	BBLA	0	0	Gjodrom 2005, 4.		3322		
year, associated		US-1905	Døc-1905	Unitod Stator	Failure of Chicago National Bank, Home Savingr Bank, and Equitable Trurt Companier (USD 26M liabilitier): Clearing Houre announcer full quarantee for depositors to prevent banking panic.	AG	0	PRI-PRI	Financial Timer, December 19, 1905.		9121		
with one or more interventions	1	CAD-1906	1906	Canada	Fraudulent Ontaria Bank ir arranged to be taken over by Bank of Montreal, which quaranteer deporitr. Other bankr in turn jointly quarantee Bank of Montreal (CAD 4.3M vol.). Royal Bank of Canada coordinater.	AHCI, BG, other	0	PRI-PRI	Forrior 1913, 39ff.; Roinhart/Roqoff; Martin 2014, 5f.	B/V/X;R/R; S/T	6130		
			Oct-1907	Canada	Government offers 10M CAD in emergency credit for banks amid panicspillover from U.S. (only 5.1M drawn)	BBLA	0	0	Martin 2014, 10f.	B/V/X; R/R; S/T	6177		
			Jan-1908	Canada	Sovereign Bank arks for CBA member bank "open door liquidation" and advances, triggering multi-year liquidation process.	AHLA	ASSOC	PRI-PRI	Carr, Mathouron, and Quigloy 1995, 1139f.	B/V/X;R/R; S/T	5694		

Intervention type

Private-sector involvement?

Literature /sources used

Real p.c. GDP at time of intervention

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### General breakdown – 20 types



Source: M/S (2021, 23).

#### General Breakdown – intervention groups by income class



## EXAMPLE: THE U.S. EXPERIENCE.

- 1. We record 36 crises, associated with 122 instances of bank interventions in United States 1791-2019.
  - United States with higher share of liquidity assistance, and rules. Lower share of capital injections, asset mgt, restructurings.



# KEY ADVANTAGES

- New and nuanced panorama of banking sector intervention patterns over multiple centuries, drawing on wide source basis.
- Methodologically, incorporates wide range of primary historical sources, non-digitized, across 14+ languages.
- Provides policy context to all major banking crises chronologies and beyond.
- Proposes first structured intervention scheme, based on balance sheet systematic.
- Provides both robust *frequency* and *intensity* architecture of bank stress, beyond DM.
- Goes beyond "systemic" bank stress perhaps most comprehensive sample of "non-systemic" stress over time.
- Easy to use and comprehensively documented (45-pp bibliography, historical data appendices).
- Horizontal, vertical files available, in excel, and replication packages.

### GDP LOSSES OVER TIME, 1300-2022.

- Financial crises over time cost average of 7.2% in real p.c. GDP over t t+5 horizon.
- For U.S., average crisis real potential GDP loss since 1818 stands at -9.6%, with 1933 at -84% and 2007 at -42%.



Notes: Basis: Arithmetic average for advanced economy sample. 1611-1869: sample including Bank of Amsterdam (1611-1809), Bank of Hamburg (1655-1770), Riksbank (1668-1869), the Public Banks of Naples (1611-1805), Bank of England (1701-1869), the Banks of the United States (1792-1848), Bank of Netherlands (1815-1864), Royal Bank of Prussia (1817-1869), Danish Nationalbanken (1835-1869), Banco de San Fernando/Banco de España (1830-1869), and the Banque de France (1800-1869); Current GDP pre-1870 is based on Smits et al. (2000) and van Zanden and van Leeuwen (2012) for Holland, Malanima (2011) for Italy, Johnston and Willamson (2020) for the United States, Edvinsson (2014) for Sweden, Broadberry et al. (2015) for the U.K., Mitchell (2013) for Denmark, Pfister (2022) for Prussia and Hamburg, Alvarez-Nogal and de la Escosura (2013) for Spain, and Ridolfi and Nuvolari (2021) for France. For full sources (incl. 1870-) and GDP bases, see FKKS (2023, appendix A.57-85).

# TIMING OF INTERVENTIONS - EARLY (RES) RETURNS?



# SVB context - 57 crises profiles - and patterns.

Out of 57 crises with AG and AHEL or BBEL,



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# BUT: PUBLIC INTERVENTION SPREE BOOSTS PRIVATE BOOM-BUST DYNAMICS.

- Define "Credit boom episodes" as country-years with >10% total credit/GDP ratio growth over past three years.
- Almost double probability (8.4%) that credit boom-bust will occur after CB balance sheet expansion over 20-year post-crisis horizon.



Notes: Share of country-years experiencing a credit boom episode, binned by the number of years since last financial crisis and respective central bank liquidity policy (mit+1 = 1). We define a country-year to belong to a credit boom episode if the credit-to-GDP ratio increased beyond +0.10 over the past three years. We label a country-year to be part of a fragile credit boom episode if in addition a financial crisis (JST basis) ensues during any of the three subsequent years.

# FUTURE EXTENSIONS, AND CURRENT APPLICATIONS

- Ongoing integration with long-run financial variables:
  - Bank equity total returns, monthly,
  - Bank sector balance sheet size and composition,
  - Financial market depth (e.g. deposit volumes/GDP intervention sizes/financial sector size),
  - CB balance sheet data, monthly (discount and collateral activity),
  - Macro-pru integration ("beyond stress tests").
- Potential uses/research
  - Wide range of thematic applicability: macro-pru, historical macro-finance, financial history.
  - Entire "efficiency" debate is opened. policy costs vs. macro benefits; how to avoid graduation of "non-systemic" events; costs of abstention (NO/I), moral hazard.
  - Unlocks wealth of new historical, macro-history granularity: interaction of bank stress and macro variables (GDP, fiscal, monetary, financial market) on secular level.
  - Assess links to monetary regime features, other political economy features (e.g. gold standard era, "state capacity" variables).

#### APPENDIX MATERIAL

# GENERAL FINDINGS, I

- Bank interventions have a long pre-Bagehot, pre-central bank history, often featuring substantial intervention sizes, e.g.:
  - 1595 Bolognese Monte fund ("early SPV") to support banking sector: 8.9% of GDP
  - 1739 Venetian recapitalization of Bancogiro: 26.9% of GDP
  - 1815 Prussian guarantee for Koeniglich Preussische Bank: 2.6% of GDP
  - 1875 Brazilian emergency loans to Banco de Brazil, Banco Rural e Hypothecario et al.: 3.1% of GDP
- Most popular pre-Bagehot tools: "rules" (DPM, SBH), "liquidity" (esp. AHLA).
- As countries "graduate" towards higher per capita GDP levels, relative importance of "NO/I", "lending" and "rules" decreases "cap. injections", "asset management", and "guarantees" increasingly prevalent.
- As countries graduate, authorities tend to target multiple balance sheet items concurrently ("balance sheet +" responses rather than "repressive" policy mix). More interventions per crisis (from 1.5x to 3.0x).
- There are clear historical trends in tools used:
  - Capital injections represent a comparatively new, 20<sup>th</sup> century tool much more scarcely used prior to 1945.
  - "Guarantees" have seen a notable revival in their frequency, and are the  $2^{nd}$  most prominent tool as of the 2000s.
  - "Rules" represent a key traditional intervention tool until the 1980s. But since then, their importance has sharply diminished.

# GENERAL FINDINGS, II

- Further:
  - Frequencies of "hands-off" ("NO/I"), or relying on private sector response ("PRI-PRI", "PRI-PRI (partly)") are becoming scarcer. Private burden-sharing, in fact, appears to have reached the lowest levels ever in the period since 1980.
  - Historically, crisis and intervention frequencies evolve differently from intervention aggressiveness:
    - Overall intervention frequency shows gradual rise from mid-18<sup>th</sup> century ("core DM" by a factor of ca. 3.5x over 1700-2019), and "U-shape" over pre- vs. post-Bretton Woods era.
    - "Mild" responses to "high" crises frequencies during classical gold standard: pre-classical gold standard period's (pre-1880) fiscal response on average more aggressive than the classical gold standard period, with comparable aggressiveness on liquidity.
    - While the Bretton Woods Period (1945-71) ranks low on crises frequency (c.f. Bordo et al. 2001), it already shows substantial rise in crises sizes. Generally, therefore authorities' *sensitivity* to bank stress has increased secularly and substantially.

Intervention costs to NGDP	Pre-1880	1880-1945	1914-1945	1945-1971	1945-1980	Post-1980
Fiscal	2.2%	1.5%	1.7%	7.1%	15.8%	11.5%
Liquidity	1.6%	1.8%	1.8%	3.6%	8.2%	14.2%
Guarantees	0.9%	7.9%	11.2%	-	0.2%	15.2%
Share of NO/I (all countries)	5.0%	16.3%	12.6%	14.7%	12.4%	6.6%
Share of "PRI-PRI", or "PRI- PRI (partly)" (all countries)	14.2%	16.0%	13.7%	9.4%	12.1%	4.9%

#### INCREASING SENSITIVITY OF PUBLIC SECTOR DURING CRISIS EVENTS

 Conditional on the existence of a crisis event, the combined probabilities of either a "hands-off" approach, or a substantial burden-sharing of the private sector in the direct intervention costs appear to have decreased substantially post-1980s – while it was unusually high during the classical Gold Standard Era (1880-1914).



Frequencies of "non-public" response categories, by historical regime (all countries)

#### INTERVENTION SIZE OVERVIEW: FISCAL, LIQUIDITY, GUARANTEES.

