Banking-Crisis interventions, 1257-2019

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NBER IFMDS

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.
- Broader intervention focus overwhelmingly on post-1980s, systemic resolution of banking crises: e.g. Laeven & Valencia, Igan et al. (2019, for post-2007). No consensus on classification.

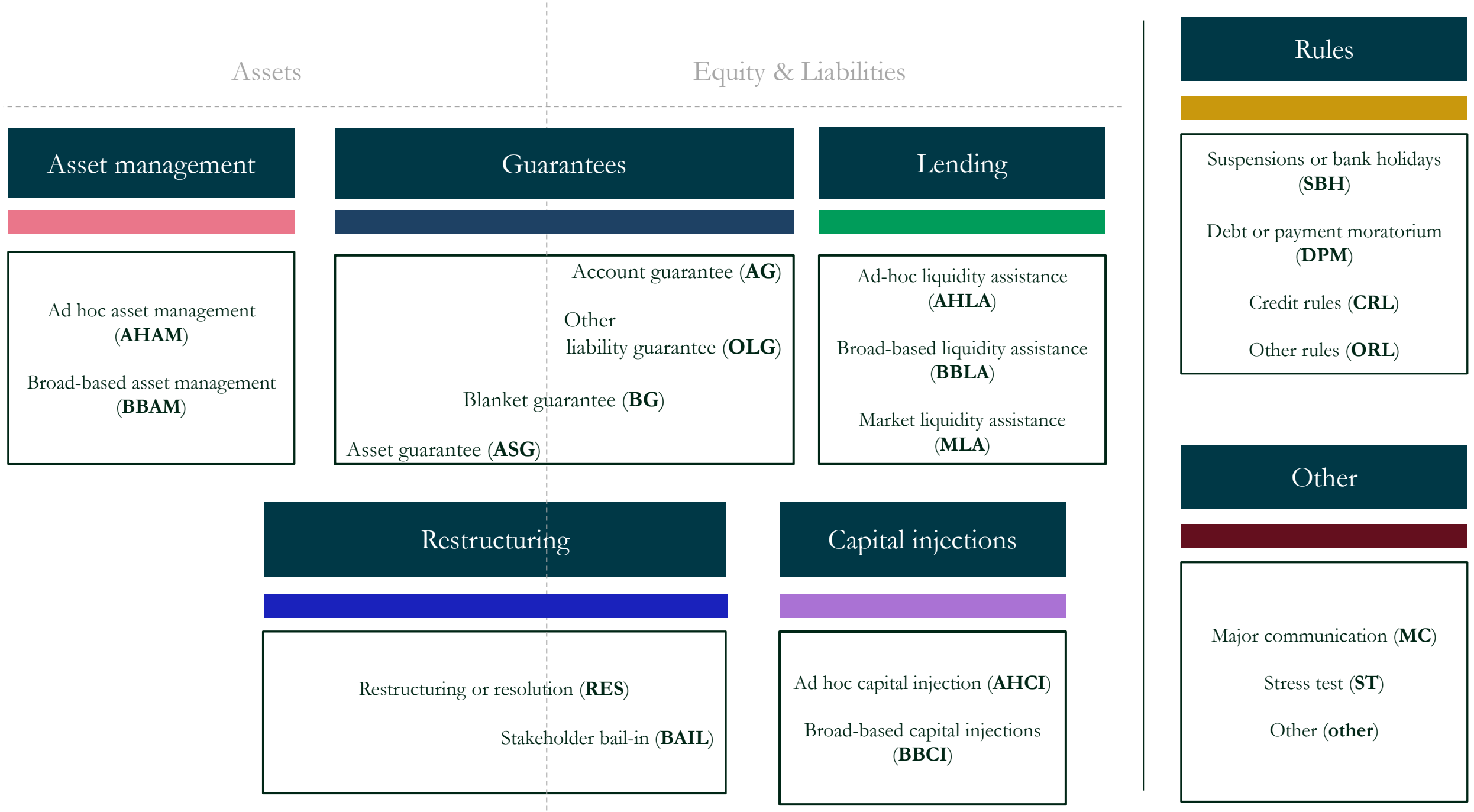
- What we ARE trying to do
  - Detail bank crises policy responses to "canonical" (existing literature) and "candidate" (new) crises, using large (published and unpublished) source basis around the world. Monthly level.
  - Detailing perhaps the largest sample of global "would-be systemic crises".
  - 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).

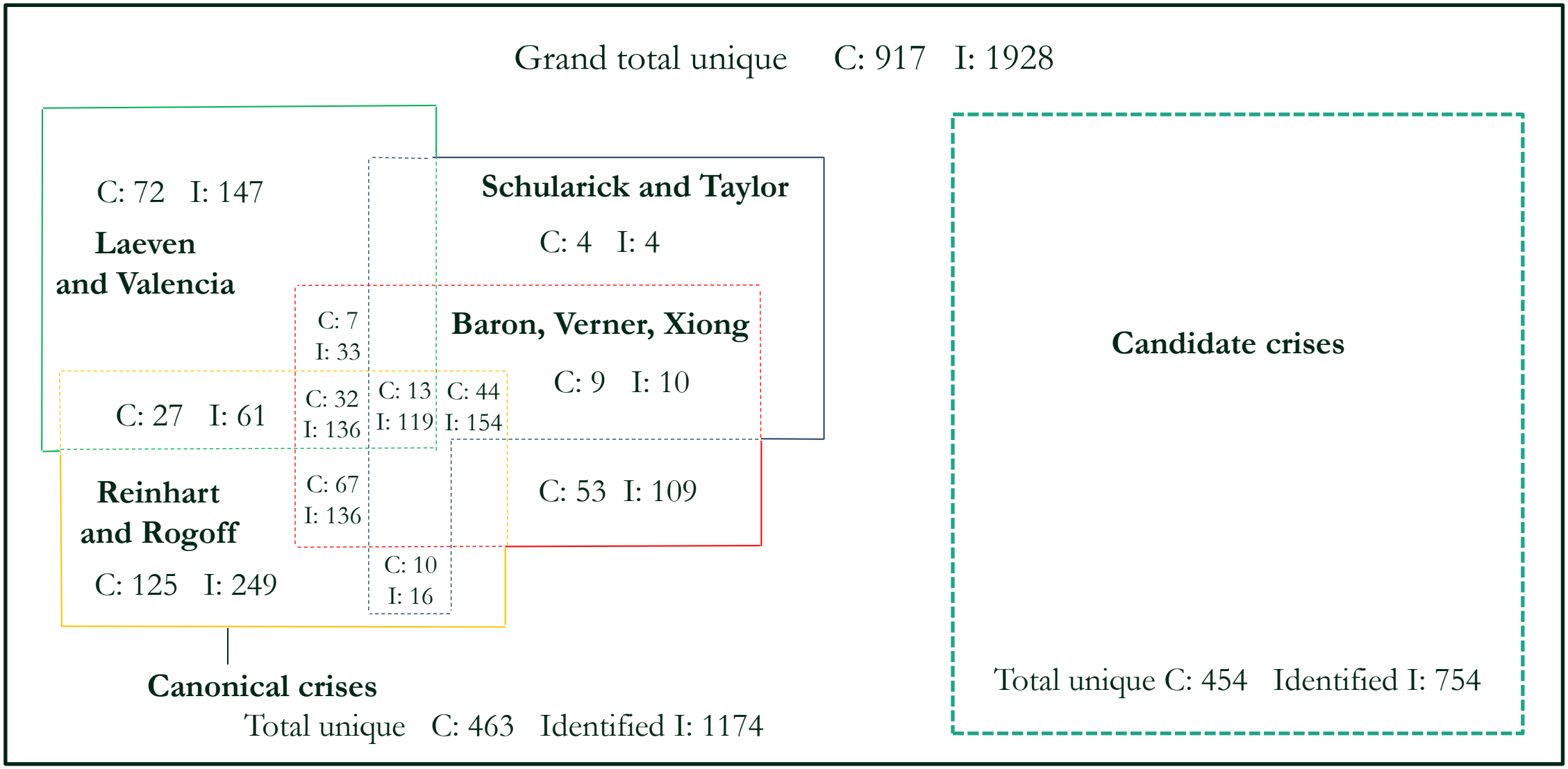
Our approach

- Classifying banking crises interventions across 7 major intervention groups, consisting of 20 intervention types.
- Including both private and public sector interventions, across "canonical" and new "candidate" crises.
- Combinations are possible – and frequent (interventions per crisis gradually rises, to 3.0x post-1971). Repeats are possible.
- Incorporating latest long-run (current) GDP series (e.g. Malanima 2011; Ridolfi 2020) to provide direct intervention costs, wherever available. Currently: 539 intervention cost datapoints (of which: 459 outside L/V's 1980-2017). Prior to 1850, current GDP focus on "Maddison+" group.

- Types
  - Lending: ad hoc liquidity assistance (**AHLA**), broad-based liquidity assistance (**BBLA**), market liquidity assistance (**MLA**).
  - Guarantees: account guarantees (**AG**), asset guarantee (**ASG**), blanket guarantees (**BG**), other liability guarantees (**OLG**).
  - Capital injections: ad hoc capital injection (**AHCI**), broad-based capital injections (**BBCI**).
  - Rules: debt and payment moratoria (**DPM**), stock market closures and bank holidays (**SBH**), credit rules (**CRL**), other rules (**ORL**).
  - Asset management: ad hoc asset management (**AHAM**), broad-based asset management (**BBAM**).
  - Restructuring: restructuring or resolution (**RES**), stakeholder bail-in (**SPI**).
  - Other: major communication (**MC**), stress test (**ST**), no intervention (**NO/I**).


Assets
Equity & Liabilities
Asset management
Ad hoc asset management (AHAM)
Broad-based asset management (BBAM)
Guarantees
Account guarantee (AG)
Other liability guarantee (OLG)
Blanket guarantee (BG)
Asset guarantee (ASG)
Lending
Ad-hoc liquidity assistance (AHLA)
Broad-based liquidity assistance (BBLA)
Market liquidity assistance (MLA)
Restructuring
Restructuring or resolution (RES)
Stakeholder bail-in (BAIL)
Capital injections
Ad hoc capital injection (AHCI)
Broad-based capital injections (BBCI)
Rules
Suspensions or bank holidays (SBH)
Debt or payment moratorium (DPM)
Credit rules (CRL)
Other rules (ORL)
Other
Major communication (MC)
Stress test (ST)
Other (other)

CRISES AND INTERVENTION UNIVERSE



C=No. of crisis country years (start year); I=No. of interventions identified for respective crises years. For full methodology, see paper section III.A.

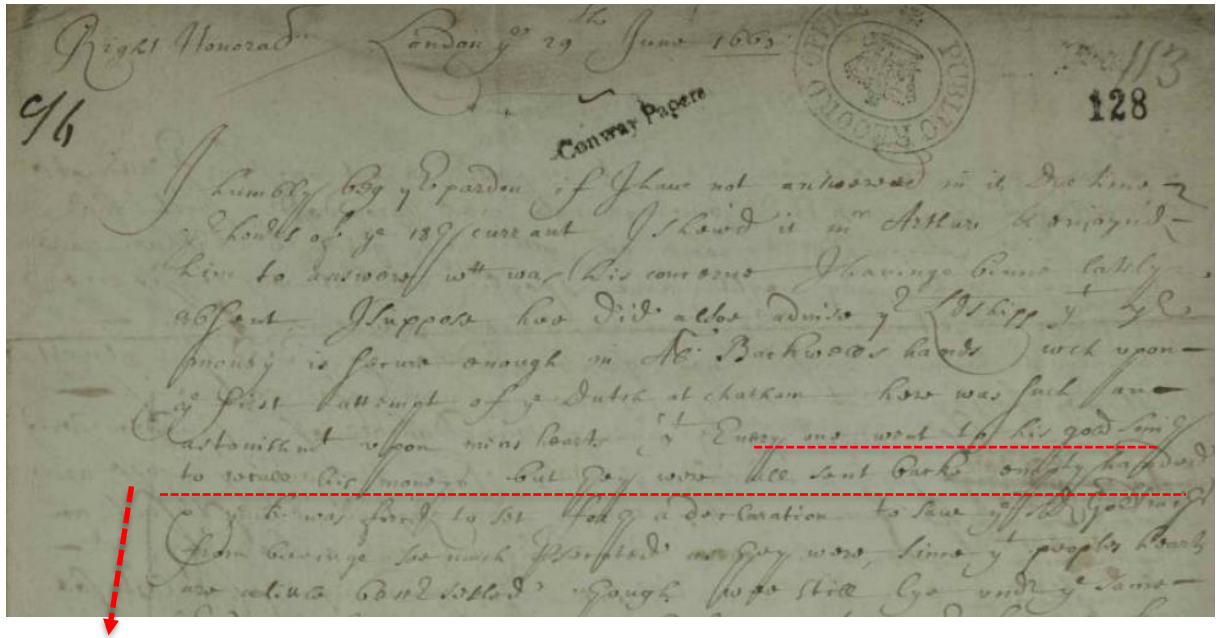
IDENTIFICATION PROCESS

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.



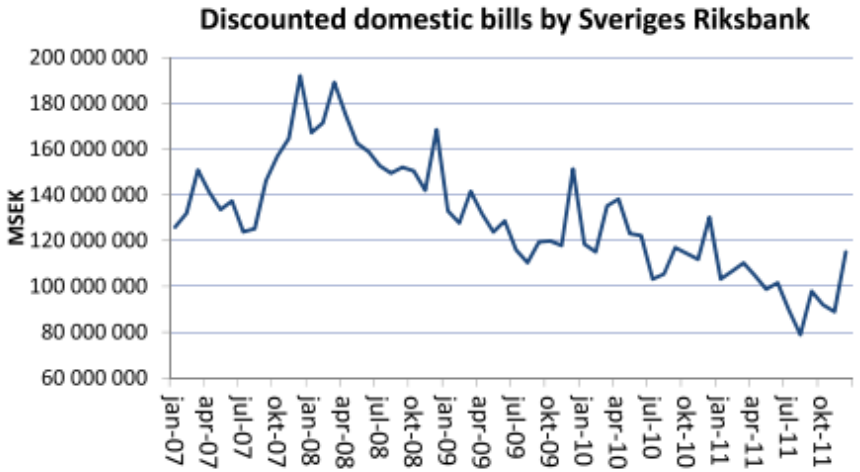
"On the first attempt of the Dutch at Chatham, there was such astonishment that every one went to his goldsmith to recall his moneys, but they were all sent back empty handed, and the King was forced to issue a declaration, to save the goldsmiths from persecution; people's hearts are better settled,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

EXAMPLE: SIZE CALCULATIONS – SWEDEN 1907, NL 1893 CRISES.



Source: *Sammandrag af Bankernas Uppgifter* 1907–1912. Monthly data in millions of SEK.

Fig. A2. Domestic bills discounted by the Riksbank 1907–1912.
Source: *Sammandrag af Bankernas Uppgifter* 1907–1912.
Note: Monthly data in millions of SEK.

- "The Riksbank provided this foreign exchange to Swedish banks through the mechanism of rediscounting bills of exchange, presented by the banks in the autumn of 1907 (Söderlund, 1964, pp. 303–304; Fregert, 2018, p. 117). Between August and December 1907, the value of domestic bills rediscounted by the Riksbank increased by 53% and returned to August 1907 levels as late as May 1909".



NEDERLANDSCHE BANK.

1893—1894.

1893—94. MIDDEL CIJF

TIJDPERK.	OPEREEREND KAPITAAL.								
	Binnenlandsche Wissels.	Buitenlandsche Wissels.	BELEENINGEN. op Effecten.	op Goederen.	op Specie.	TOTAAL.	Voorschotten in Rek.-Courant.	Voorschotten aan het Rijk.	TOTAAL.
1.	2.	3.	4.	5.	6.	7.	8	9	10.
April 1893	f 30,467,750	f 28,981,919	f 33,646,157	f 2,800,754	f 3,504	f 36,450,415	f1,529,446	f 21,595	f 97,451,1
Mei „	36,434,622	25,779,548	38,902,804	3,297,197	480	42,200,481	1,872,622	—	106,287,2
Juni „	36,283,097	17,570,304	40,028,414	3,253,893	—	43,282,307	1,088,966	—	98,224,6
Juli „	38,130,841	14,672,941	41,418,407	3,103,594	—	44,522,001	1,361,705	381,732	99,069,2
Augustus „	40,064,885	11,083,760	42,799,321	3,181,891	—	45,981,212	1,194,118	—	98,323,9
September „	38,426,968	8,669,826	42,582,270	3,686,793	13,254	46,282,317	1,550,968	—	94,930,0
October „	40,191,827	10,794,959	43,689,095	3,930,205	24,085	47,643,385	2,262,269	44,170	100,936,6
November „	43,002,542	13,204,449	42,150,816	4,606,278	48,296	46,805,390	1,969,299	—	104,981,6
December „	37,891,783	21,133,371	36,777,401	6,028,516	53,500	42,859,417	1,490,047	—	103,374,6
Januari 1894	35,877,171	23,573,444	34,612,789	6,809,464	49,650	41,471,853	1,494,765	—	102,417,2
Februari „	29,393,035	24,985,267	29,913,104	6,377,871	45,800	36,336,775	1,418,707	—	92,133,7
Maart „	26,961,948	24,395,104	28,651,796	5,782,355	39,158	34,473,309	1,063,144	—	86,893,5
1893/94.	f 36,174,553	f 18,565,589	f 38,031,711	f 4,391,502	f 22,924	f 42,446,137	f1,523,342	37,882	f 98,747,5

VERHOUDING DER MIDDE

- DNB Balance Sheet – "Discontos, Beleeningen op effekten", Apr 1893 – Maart 1894.

→ "NO/I"

Source: Nationaal ArchiefDe Nederlandsche Bank N.V.: Jaarverslagen, F1100212/2013, 457697 ; Grodecka-Messi, Kenny, and Oegren (2021).

DATABASE STRUCTURE

Monthly/annual intervention date

Total no of countries: 142

Details on intervention and intervention size, wherever available

Intervention associated with existing crises chronology ("canonical")?

Crisis Code	When	Where	Monetary/government response	What	Conduit	Flag	Literature	B/W%, L/V, R/R or S/T?	Income p.c. level (2011 GK$) - MPD
	PRE-MODERN ERA, 1290-1693								
BRL-1900	Sep-1900	Brazil	GBP 900,000 emergency loan and restructuring of Banco da Republica amid runs, including swap of bank debt with Treasury notes (ownership remains mixed public-private).	AHLA, RES	0	0	Reinhart/Rogoff; Mettenheim 2010, chapter 3.	R/R	874
GER-1901	Jun-1901	Germany	Crisis at Prussian and Pfandbrief banks. Private emergency help for Pomeranian Mortgage Bank from Deutsche Bank and Darmstaedter Bank; Prussian mortgage banks provide 15M Mark aid to Preussische Hypothekenbank and Deutsche	BBLA	0	PRI-PRI	Kritzler 1903, 4ff.; Financial Times, June 11, 1902; Bopp 1954; Reinhart/Rogoff	B/W%; R/R; S/T	4576
JP-1901	Apr-1901	Japan	Wave of failures in Osaka and Central/Southern provinces, including run on Yokohama Specie. Suspension by government to encourage mergers among smaller banks; unspecified "assistance" from Bank of Japan to banks.	other	0	PRI-PRI (partly)	Financial Times, April 27, 1901; Patrick 1999; Reinhart/Rogoff	R/R	2162
DK-1902	1902	Denmark	Abildgren et al (2011, 6) and others do not report interventions.	NO/I	0	0	Reinhart/Rogoff	R/R	5007
RUS-1905	1905	Russia	Amid revolutionary upheaval, run on Savings Banks. Government issues order limiting gold withdrawals for all funds at State Bank and branches.	SBH	0	0	Bernatzky 1928, 349.		1935
NOR-1905	Aug-1905	Norway	Dissolution decision with Sweden leads to spike in uncertainty: "fairly large cash withdrawals at banks...banks had to resort to loans from Norges Bank".	BBLA	0	0	Gjedrem 2005, 4.		3322
US-1905	Dec-1905	United States	Failure of Chicago National Bank, Home Savings Bank, and Equitable Trust Companies (USD 26M liabilities): Clearing House announces full guarantee for depositors to prevent banking panic.	AG	0	PRI-PRI	Financial Times, December 19, 1905.		9121
CAD-1906	1906	Canada	Fraudulent Ontario Bank is arranged to be taken over by Bank of Montreal, which guarantees deposits. Other banks in turn jointly guarantee Bank of Montreal (CAD 4.3M val.). Royal Bank of Canada coordinates.	AHCI, BG, other	0	PRI-PRI	Ferrier 1913, 39ff.; Reinhart/Rogoff; Martin 2014, 5f.	B/W%; R/R; S/T	6130
	Oct-1907	Canada	Government offers 10M CAD in emergency credit for banks amid panic spillover from U.S. (only 5.1M drawn)	BBLA	0	0	Martin 2014, 10f.	B/W%; R/R; S/T	6177
	Jan-1908	Canada	Sovereign Bank asks for CBA member bank "open door liquidation" and advances, triggering multi-year liquidation process.	AHLA	ASSOC	PRI-PRI	Carr, Mathewson, and Quigley 1995, 1139f.	B/W%; R/R; S/T	5694

Crisis start year, associated with one or more interventions

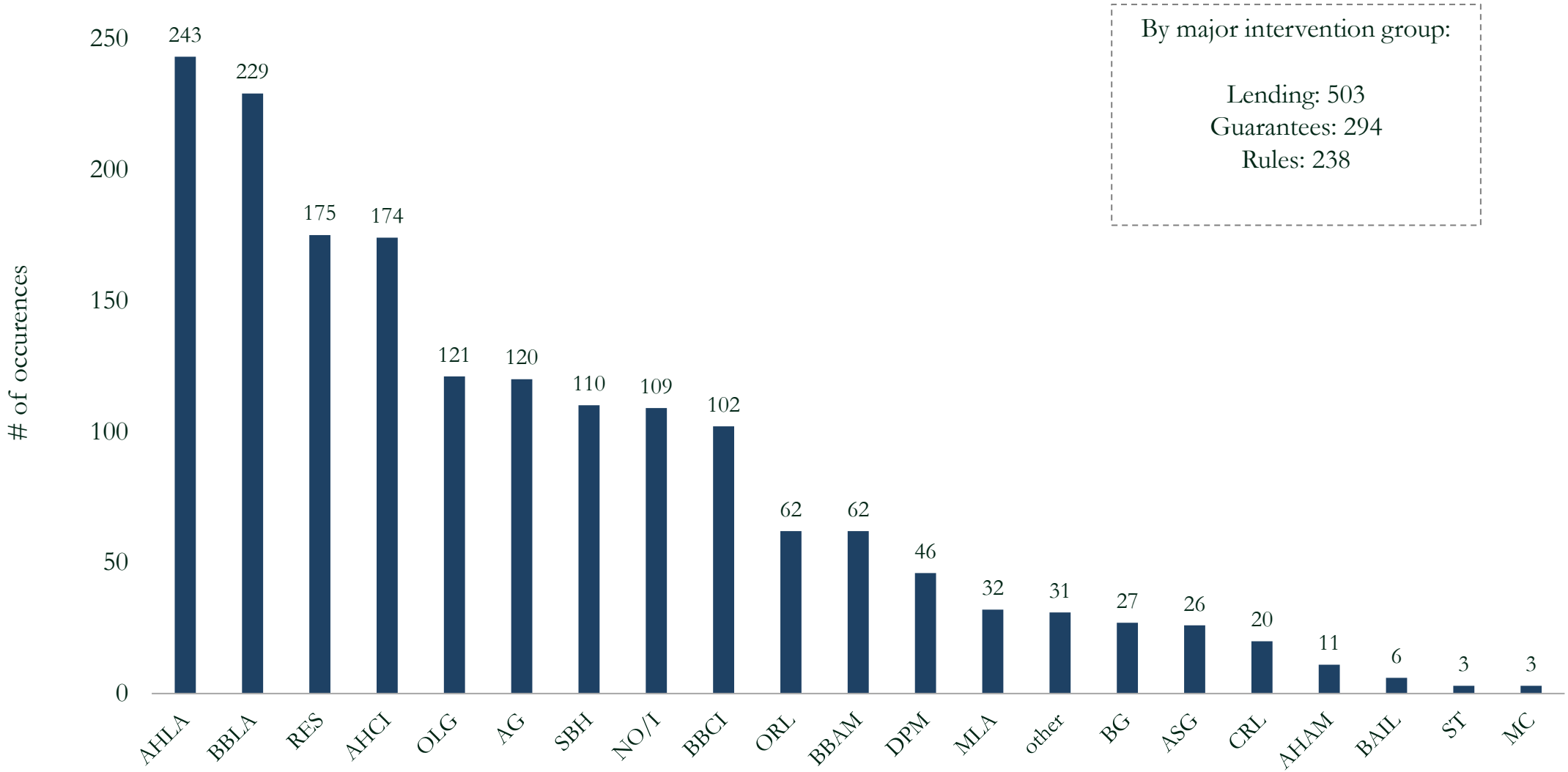
Intervention type

Private-sector involvement?

Literature /sources used

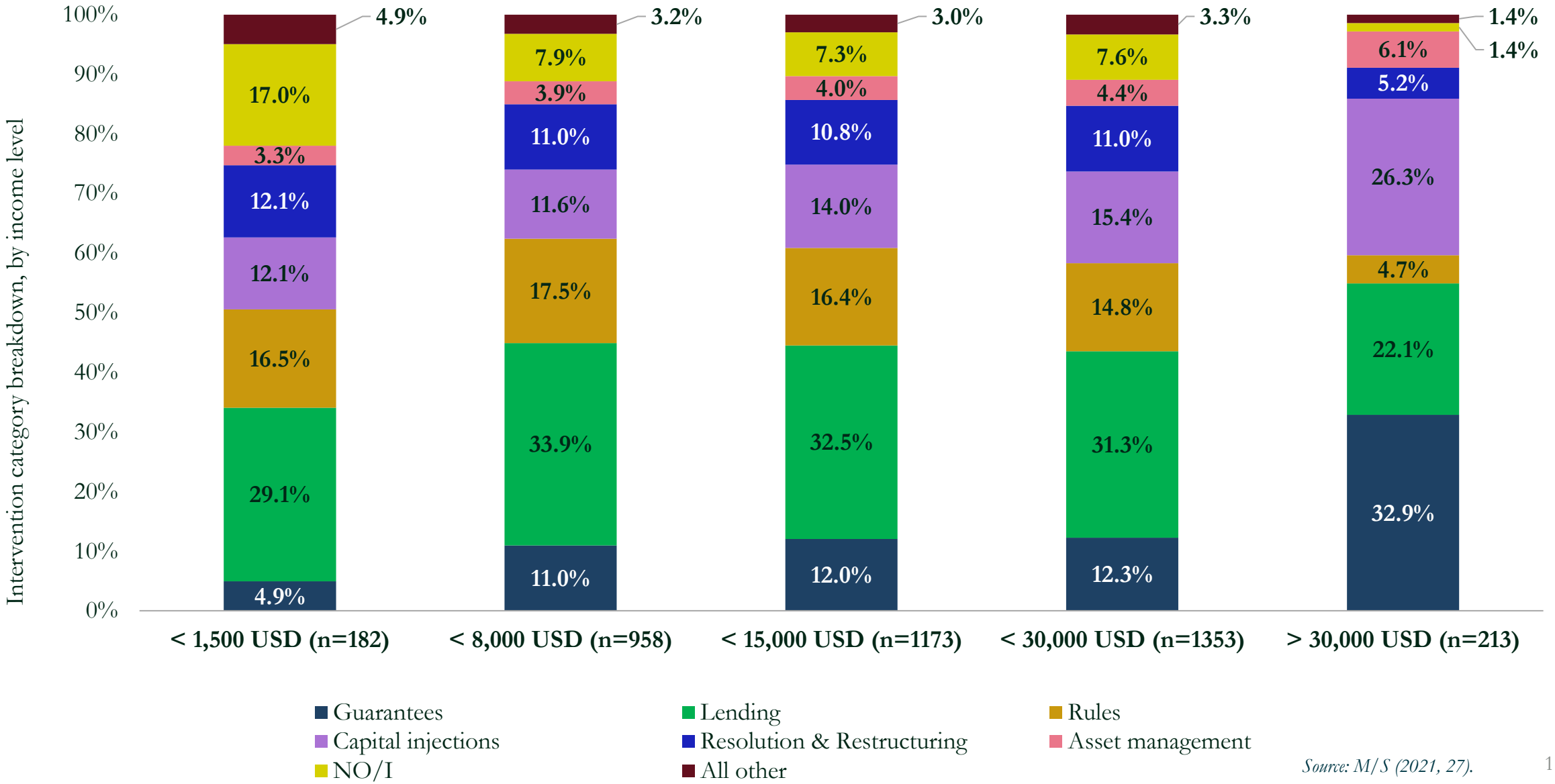
Real p.c. GDP at time of intervention

General breakdown – 20 types



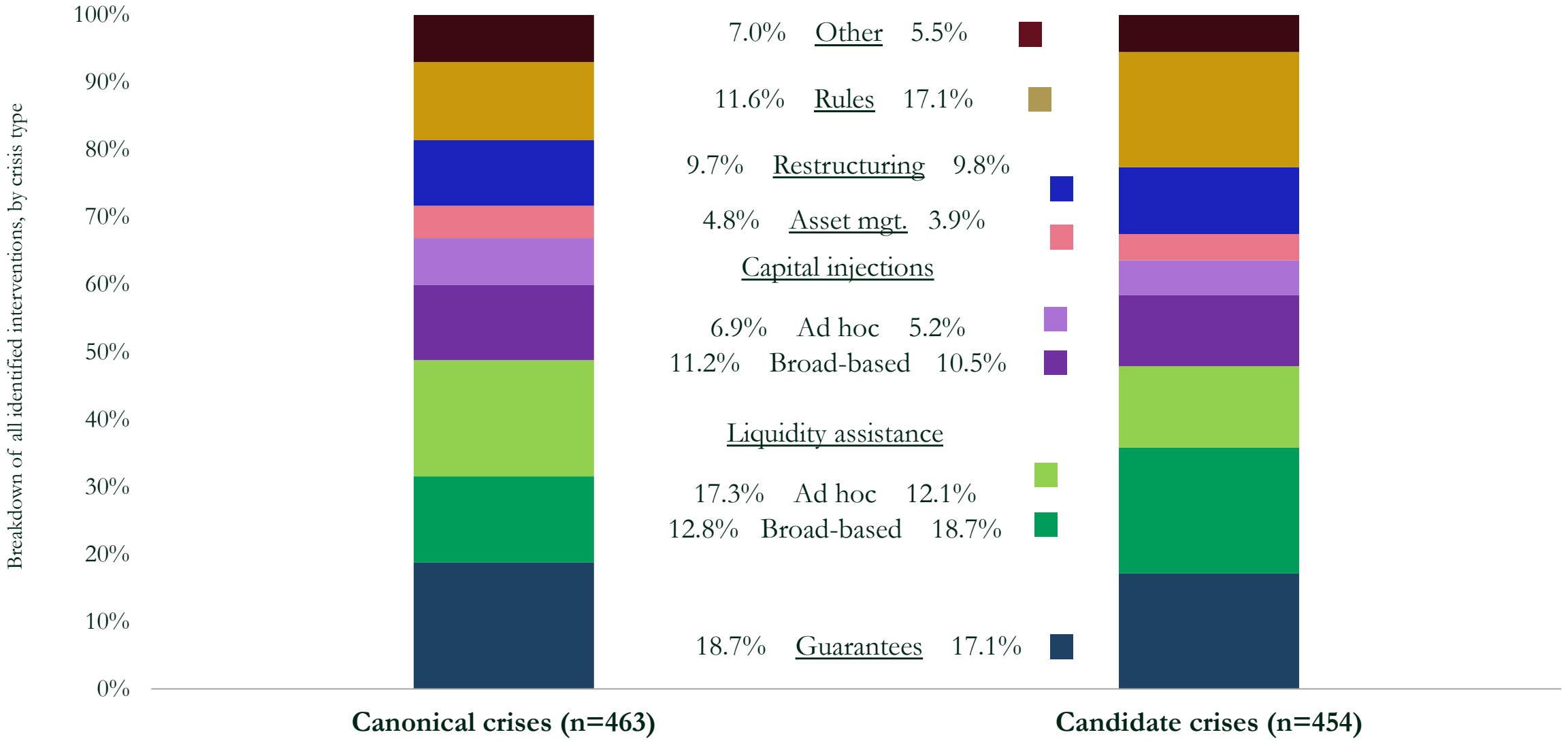
Source: M/S (2021, 23).

General breakdown – intervention groups by income class



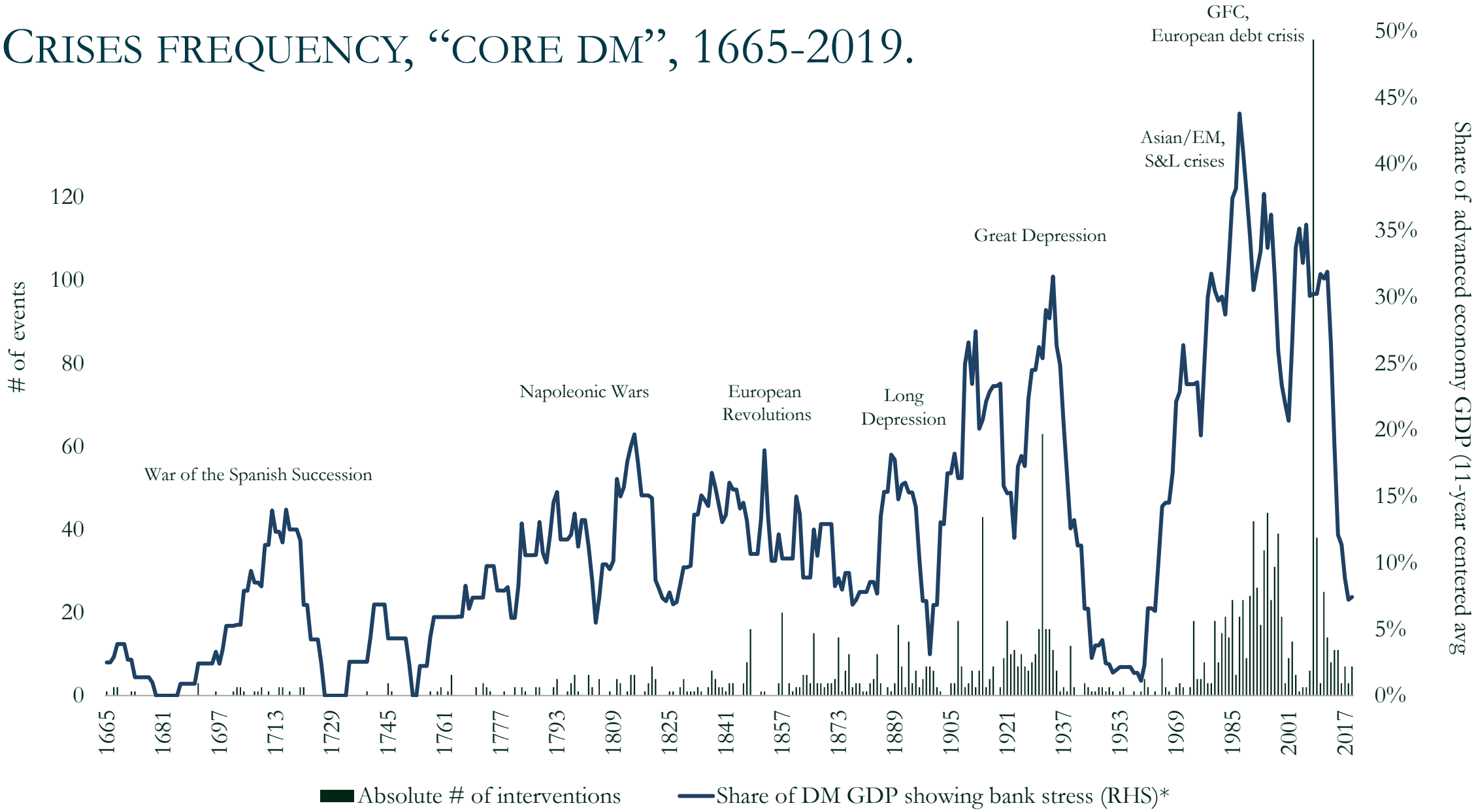
Source: M/S (2021, 27).

"CANONICAL" VERSUS "CANDIDATE" CRISES RESPONSE



Source: M/S (2021, 26).

CRISES FREQUENCY, "CORE DM", 1665-2019.



*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. Frenquency=(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 (2020).

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.

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, 20th century tool – much more scarcely used prior to 1945.
  - "Guarantees" have seen a notable revival in their frequency, and are the 2nd 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.

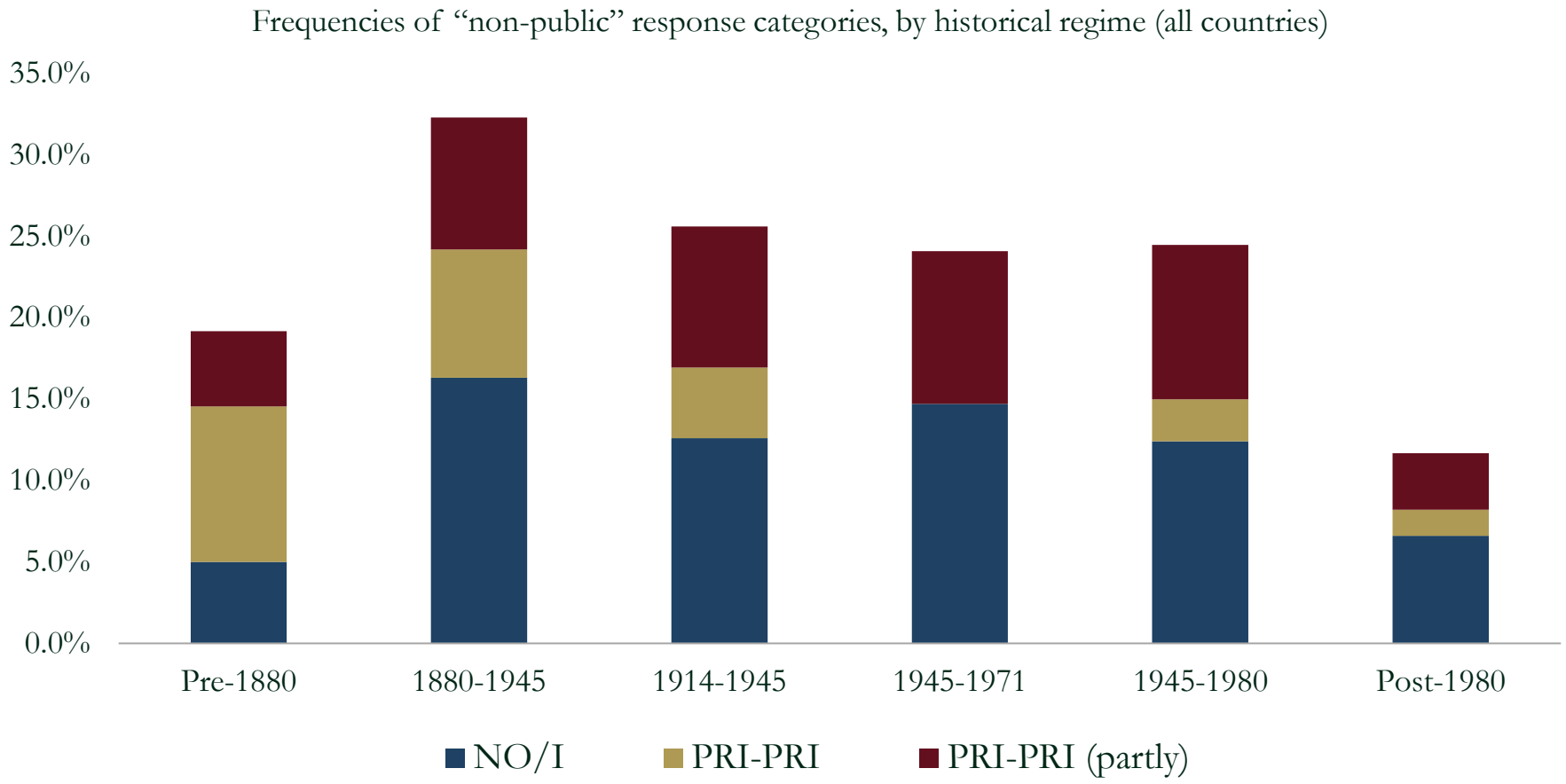
General findings, II

- 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-18th 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).



INTERVENTION SIZE OVERVIEW: FISCAL, LIQUIDITY, GUARANTEES.

