Online Appendices for "Stress Relief? Funding Structures and Resilience to the Covid Shock" by Kristin Forbes, Christian Friedrich, Dennis Reinhardt

Online Appendix A: CDS Data – Compilation and Categorization across Sectors

This section describes the process of downloading, cleaning, extracting, categorizing, and constructing the final CDS series that are used in the paper. It ends with some summary statistics of country-sector coverage in the final dataset.

Download: To compile data on CDS for a broad range of countries, sectors, and companies, we begin by downloading all available daily CDS data from Refinitiv via Datastream between October 21, 2020, and November 2, 2020, covering the window from January 1, 2020, through October 20, 2020. We include daily price data, as well as information on seniority, term length, and entity (when available).

Clean the dataset: To clean the dataset, we drop any CDS meeting the following criteria. (A * indicates it was dropped later in the cleaning process.)

- Inactive (labelled as "Dead" by Refinitiv)
- Duplicates (labelled as "Duplicate" by Refinitiv)
- Relate to indices instead of individual entities
- Do not refer to a specific market/country:
    - "Eastern Europe (Oxford Econ Industry)", "Oil Exporting Countries", "Other African", "Other Asian", "Other Australasian", "Other Caribbean", "Other Central America", "Other Western European", "International"
- Do not have a company name (18 cases)*
- From central banks (3 cases)*
- Where the company cannot be identified because the company name is too short or too generic (12 cases)*
- Non-traded. To exclude CDS that appear to be non-traded, we use three criteria. First, we exclude any CDS with no price data. Second, we exclude CDS that have zero standard deviation over the sample period (1 January 2020-31 May 2020). Finally, we exclude CDS with constant prices for the first 15 trading days at the start of the sample. If there is a period of more than 15 days when there is no change in the daily price (other than the start of the sample), however, the CDS can still be included in the sample, but is marked as missing after the price stays constant for 15 days

Extract provided information: For each remaining CDS series, we extract the following information.

- Seniority information
    - Senior vs. Subordinated; a few cases carry the classifications: PREF and SEC
- Term length
    - Ranges from 0 years to 30 years
- Entity information
    - (A) Banks, (B) Sovereigns, (C) Extended Government, (D) Non-bank Financials, (E) Corporates

Extract Entity Information—Overview: Next, we classify each of the CDS into five groups: *Sovereigns, Banks, Other Financials, Extended Government,* and *Corporates* (the residual). This classification is not always straightforward, and therefore to put CDS into each of these groups we employ four complementary approaches.

- ***Refinitiv info:*** Refinitiv provides information on entities for a limited set of CDS through its data explorer. The main advantage of this approach is that the entity information is readily available. A disadvantage of this approach is that this information is only available for a (small) subset of entities and in some cases does not agree with our own classification (e.g., for some of the non-bank financials).
- ***Pre-specified list:*** This approach identifies entities based on a comparison of the company name in the CDS data with a pre-specified list of entity names that we obtain from public sources (such as lists of bank and insurance companies by country). An entity is identified if there is a perfect match between (parts of) the company name in the CDS data and the name entry in the pre-specified list. The main advantage of this approach is that well-known entities are identified, even though their names may not reveal the entity type

(e.g., a bank that does not carry the term "Bank" in its name). Disadvantages are that this approach requires comprehensive external inputs (e.g., list of banks, insurance companies, sovereigns, etc.) and that it relies on an exact match (i.e., if any of the names contain a typo or they are written in an unusual way, they will not be matched).

- ***Generic text search:*** This approach identifies entities based on generic name stubs that are usually associated with this type of entity. In particular, the approach checks whether a stub (e.g., "bank" in various languages) is contained anywhere in the CDS name. The advantage of this approach is that lesser known entities can be identified as well. The main disadvantage is that certain stubs occur naturally in company names unrelated to the entity type and thus entity can be misclassified. Moreover, entities could have names in a language that was not part of our stubs.
- ***Visual inspection of the residual file:*** The last approach is based on a visual inspection of the residual file of non-identified entities. This approach is based on a manual Google search of each company name in the residual file and a determination of the entity type based on the returned search result.

Extract Entity Information—Details by Sector: Details on how each of these classifications protocols was applied by sector are listed below.

(A) Banks: The identification of banks is based on the following criteria. (A CDS is classified as belonging to the category of Banks if it is classified under any of these approaches.)

- ***1) Refinitiv info:*** Banks that have been identified by Refinitiv (category "Banks")
- ***2) Pre-specified list:*** The universe of company names in the CDS data is checked against a list of pre-specified bank names obtained from external sources. If there is an exact match of all characters in the list of pre-specified bank names and the company name in the CDS data (or a subset of the company name), then the CDS is identified as belonging to a bank.
    - The list of pre-specified bank names includes the largest 120 banks by asset size world-wide[1] and a sample of 5000 international bank names[2]
    - To increase the probability of a match, we make the following modifications to the pre-specified list of bank names:
        - We drop all "." and ","
        - We drop all parentheses, including their content (e.g., abbreviations of the bank name)
        - We drop the following abbreviations of companies' legal entity information: LTD, SA, AG, PLC, CORP
- ***3) Generic text search:*** A text search that searches for the following terms and identifies a CDS as that of a bank when the company name contains this word:
    - *bank, banco, banca, banche, banque, caixa, sparkasse, cassa, bankë, banku, банк, banka, банка, banc, banca, pank, pankki, τραπεζα, bainc, bankas, bancă, breh*
- ***4) Visual inspection of the residual file:*** All banks that were found in the residual file are manually classified as banks (after conducting a Google search that confirms their entity type)

Finally, we manually exclude all Development Banks, ExIm Banks, and Central Banks as well as wrongly identified corporates[3] from the list of banks.

(B) Sovereigns: A CDS is classified as that of a sovereign entity based on the following criteria:

- ***1) Refinitiv info:*** The CDS of sovereigns that have been identified by Refinitiv (category "Sovereigns")
- ***2) Generic text search:*** A text search based on the following search terms:
    - *government, gvt, govt, republic, rep, kingdom, states*

[1] Source: https://www.relbanks.com/worlds-top-banks/top-world-banks-by-assets-2019; download 27 Oct. 2020.
[2] Source: https://www.globalbrandsmagazine.com/list-of-banks-by-country/; download 27 Oct. 2020.
[3] E.g., "Pepsi Bottl**ing Group**" may be wrongly identified as bank because of "**ING Group**". Moreover, in a few cases, we reclassify a bank as a non-bank financial company (e.g., "Hartford Financial Services").

- ***3) Pre-specified list:*** A comparison of the universe of CDS company names with a pre-specified list of country names from the WEO Database.[4]
- ***4) Visual inspection of the residual file:*** The manual addition of a few sovereign CDS found in the residual file

Finally, we exclude all wrongly identified corporates[5] and extended government agencies[6] from the list of sovereigns.

(C) Extended Government: A CDS is classified as that of an extended government entity based on the following criteria:

- ***1) Refinitiv info:*** Use the information contained in the Refinitiv categories "Agency", "Supranational", and "Official & Municipal"
- ***2) Generic text search:*** A text search that used the following terms:
  - *state, province, prefectur, city*
- ***3) Pre-specified list:*** All Development Banks and Export–Import (ExIm) Banks that were identified in the process of conducting the sovereign identification
- ***4) Visual inspection of the residual file:*** The manual addition of a few extended government entities found in the residual file

Finally, we exclude all wrongly identified corporates[7] from the list of extended government entities.

(D) Non-Bank Financials: The identification of non-bank financials is based on the following criteria:

- ***1) Refinitiv info:*** All CDS names from Refinitiv in the category "Non-bank financials" that could be identified as such based on a Google search[8]
- ***2) Pre-specified list:*** A search for an exact match between the universe of CDS company names and a pre-specified list of non-bank financial institutions.[9] To increase the chances of a match, we make the same adjustments to the pre-specified list of names as in the approach to identify banks:
  - We drop all "." and ","
  - We drop all parentheses, including their content (e.g., abbreviations of the bank name)
  - We drop the following abbreviations of companies' legal entity information: LTD, SA, AG, PLC, CORP
- ***3) Generic text search:*** A text search using the following words:
  - *fin, insur, invest, venture, leasing, fund, mutual, hedge, trust, pension, assurance, estate, asset, capital, credit, guaranty, sec, life*
- ***4) Visual inspection of the residual file:*** Manual addition of the non-bank financials entities found in the residual file

Finally, we exclude all wrongly identified corporates[10] from the list of non-bank financials.

(E) Corporates: The identification of corporates differs slightly from the previous cases and is based on the following criteria:

1) ***Refinitiv info:*** Use of all information from the Refinitiv categories "Consumer", "Electric", "Energy", "Gas", "Manufacturing", "Services", "Telephone", and "Transportation"

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[4] Since many company names contain a country name as reference to their country of origin, the pre-specified list approach is implemented slightly differently than in the other cases. Conditional on not being identified as a sovereign via Approaches 1 and 2, the names that appear in both the pre-specified list of country names and in the universe of CDS company names are manually classified as sovereigns. This is equivalent to conducting an automatic search for an exact match between the pre-specified list of country names and the universe of CDS company names and excluding the wrongly identified cases by hand afterwards. However, due to the frequent use of country references in company names, this list would be quite large.

[5] E.g., "**Republic** Services INC" may be wrongly identified as sovereign because of the search term "**Republic**".

[6] E.g., "**Govt** of Ontario" may be wrongly identified as sovereign because of the search term "**Govt**".

[7] E.g., "**Allstate Corp**" may be wrongly identified as extended government because of the search term "**State**".

[8] This category appears to contain a considerable number of firms that could be considered as non-financial firms. These cases are manually re-classified as corporates.

[9] This list includes the largest global insurance companies (https://www.statista.com/study/40950/top-100-insurance-companies-global/), asset management firms (https://en.wikipedia.org/wiki/List_of_asset_management_firms), and financial services companies (https://en.wikipedia.org/wiki/List_of_largest_financial_services_companies_by_revenue).

[10] E.g., "**Sec**uritas AB" may be wrongly identified as non-bank financial because of the search term "**Sec**".

2) ***Pre-specified list:*** Addition of all corporates that are included in the Refinitiv category "Non-bank Financials" but that belong in the group of corporates[11]
3) ***Other:*** All CDS that are not identified as banks, sovereigns, extended government, non-bank financials
    - Manually checked with a Google search (around 1250 cases that have non-missing and time-varying CDS data)

Extracting Series for Analysis: After classifying each CDS series by sector, we then drop all of the CDS classified as *Extended Government* and *Other Financials* for the remainder of this analysis. These groups include a mix of entities that vary across countries, are hard to compare and classify, and involve different degrees of government backing (especially for *Extended Government*).[12] Also, only a small subset of mostly advanced economies have information for *Other Financials,* which would severely limit the sample size for our analysis.

Finally, for some entities with several CDS series (such as a country or company that has issued CDS of different currencies, maturities or legal characteristics), we create a composite measure that balances standardization with maximizing coverage. More specifically, we use CDS denominated in US$ with four to six year maturities, and if more than one CDS is available that meets these criteria, we collapse the observations by taking the country-sector-date mean. If a country-sector combination does not have any CDS meeting these criteria, we use CDS with one to three year maturities instead (collapsing any CDS within this group if more than one is available).

Characteristics of Database: After completing the data compilation process outlined above, we have information on 2,532 CDS series, covering 68 different countries.[13] When these CDS are broken down by sector, we have 127 CDS for *Sovereigns*, 396 for *Banks,* and 2009 for *Corporates*.

Finally, we create a composite measure at the country-sector level. This yields country-sector data for 61 countries with data on *Sovereigns*, 32 with data on *Banks*, and 40 with data on *Corporates*. Coverage for *Sovereigns* and *Corporates* includes a mix of Advanced Economies (AEs) and Emerging Market Economies (EMEs), while the data for *Banks* is predominantly for AEs. Online Appendix Table A1 lists each of the countries in the CDS sample, with the number of CDS series for each of the sectors.

[11] E.g., even though "Porsche Automobil" is a holding company, based on its clearly defined investment focus on the automotive sector, it fits the corporate classification better than that of a non-bank financial firm.

[12] The *Extended Government* group includes agency, "supranational" and municipal debt, ranging from states to provinces to prefectures to cities, as well as development banks and export-import banks. *Other Financials* includes a range of non-bank financial institutions—such as insurance companies, property companies, credit card/payment service providers, and the capital/financing arms of corporations. It has minimal coverage of the hedge funds, money market funds, mutual funds, broker dealers, etc., which are important segments of the non-bank financial sector in most countries.

[13] It should be noted that the CDS series themselves are composite measures of all the traded and reported CDS contracts that fall in the same category (e.g., US$ denomination, 5-year maturity). Hence, even a single CDS series can represent a large sample of individual CDS contracts.

Table A1: Country and Sectoral Coverage in CDS Sample

Country	*Sovereign*	*Bank*	*Corporate*	*Total*
Argentina	2	0	0	2
Australia	3	29	41	73
Austria	3	6	2	11
Bahrain	2	0	0	2
Belgium	4	6	1	11
Bermuda	0	2	18	20
Brazil	2	7	12	21
Canada	0	7	55	62
Cayman Islands	0	0	4	4
Channel Islands	0	0	1	1
Chile	2	0	2	4
China	2	5	0	7
Colombia	2	1	0	3
Croatia	2	0	0	2
Cyprus	2	0	0	2
Czech Republic	1	0	0	1
Denmark	2	6	9	17
Dominican Republic	1	0	0	1
Egypt	3	0	0	3
Finland	4	0	19	23
France	2	15	93	110
Germany	3	31	82	116
Greece	4	2	5	11
Guatemala	1	0	0	1
Hong Kong	2	2	11	15
Hungary	2	0	0	2
Iceland	1	0	0	1
India	1*	18	7	26
Indonesia	1	0	0	1
Iraq	1	0	0	1
Ireland	4	0	2*	6
Israel	2	0	5	7
Italy	3	28	20	51
Jamaica	1	0	0	1
Japan	4	13	54	71
Latvia	2	0	0	2
Lithuania	1	0	0	1
Luxembourg	0	0	12	12
Malaysia	1	0	4	5

Country	*Sovereign*	*Bank*	*Corporate*	*Total*
Mexico	1	0	12	13
Morocco	2	0	0	2
Netherlands	3	16	41	60
New Zealand	0	0	2	2
Norway	3	0	6	9
Pakistan	3*	0	0	3
Peru	2	0	0	2
Philippines	2	0	2*	4
Poland	2	0	0	2
Portugal	4	2	6	12
Romania	2	0	0	2
Russia	2	5	2	9
Saudi Arabia	2	1	0	3
Serbia and Montenegro	1*	0	0	1
Singapore	0	9	4	13
Slovakia	2	0	0	2
Slovenia	2	0	0	2
South Africa	2	0	1	3
South Korea	2	15	18	35
Spain	3	23	26	52
Sweden	3	11	32	46
Switzerland	0	9	28	37
Taiwan	0	4	2	6
Thailand	2	0	0	2
Turkey	2	2	0	4
United Kingdom	4	52	156	212
United States	0	69	1212	1281
Uruguay	2	0	0	2
Vietnam	1*	0	0	1
Total	**127**	**396**	**2009**	**2532**

Note: Table lists the number of CDS series for each country by sector (*Sovereign, Bank* and *Corporate*). Underlying data on individual CDS is from Refinitiv, compiled and collapsed as described in Section 3 and Online Appendix A. Entries with stars (*) indicate that CDS with shorter maturities between 1 and 3 years have been used to calculate the composite measure at the country-sector level.

Online Appendix B: Summary Statistics and Data on Funding Structures and Stress

Table B1: Data for Funding Structures: *Intermediation* and *Internationalization*

Sector	Variable	Construction/Sources	Mean	Med.	S.D.	Obs.
Intermediation						
Banks *Source*	*Household liabilities/total liabilities*	Bank's liabilities vis-à-vis households divided by total liabilities from all sources. Domestic and – where available – foreign sources. All instruments. Source: BIS International Banking Statistics (IBS)	0.31	0.291	0.113	56
	Bank liabilities/total liabilities	Bank's liabilities vis-à-vis other banks divided by total liabilities from all sources. Domestic and foreign sources. All instruments. Source: BIS IBS	0.253	0.25	0.105	66
	NBFI liabilities / total liabilities	Bank's liabilities vis-à-vis NBFIs divided by total liabilities from all sources. Domestic and foreign sources. All instruments. Source: BIS IBS	0.127	0.091	0.076	66
Instrument	*Loans / total liabilities to banks*	Loans and deposits from all sectors as share of funding in all instruments from all sectors. Domestic and foreign sources. Source: BIS IBS	0.821	0.821	0.102	66
	NBFI loans / total liabilities to NBFIs	Loans and deposits from NBFIs as share of funding in all instruments from NBFIs. Domestic and foreign sources. Source: BIS IBS	0.72	0.675	0.183	49
Corporates *Source*	*Bank liabilities / total liabilities*	Claims by local and cross-border banks on corporates (BIS IBS Locational banking stats (LBS) and consolidated stats (CBS) where LBS not available) divided by total credit extended to corporates from all sources (from BIS long time series for domestic credit).	0.491	0.441	0.189	56
	NBFI liabilities[3] / total liabilities	1 minus the previous measure.	0.509	0.559	0.189	56
Instrument	*Bank loans/total liabilities to banks*	Loans and deposits from banks as share of all instruments from banks. Source: BIS IBS	0.899	0.901	0.046	55
Internationalization						
Banks *Currency*	*US$ liabilities / total liabilities[4]*	Local US$ liabilities from all sectors plus US$ loans from cross-border sources + US$ international debt issuance by private banks (nationality basis) divided by total liabilities calculated in the same way for all currencies. Source: BIS IBS and BIS International Debt Statistics (IDS).	0.135	0.108	0.101	66
Counterparty location	*Cross-border liabilities / total liabilities*	Liabilities from cross-border sources divided by total liabilities. Source: BIS IBS.	0.253	0.241	0.137	66
Corporates *Currency*	*US$ liabilities / total liabilities[4]*	Local US$ claims by banks on corporates plus US$ loans from cross-border banks to corporates + US$ international debt issuance by corporates (nationality basis) [A] divided by total liabilities calculated in the same way for all currencies or – if not available - by total credit extended to corporates from all sources. Source: BIS IBS, BIS IDS and BIS long time series for domestic credit.	0.126	0.087	0.094	66
Counterparty location	*Cross-border liabilities / total liabilities*	Claims by cross-border banks on corporates + international debt issuance of corporates (residency basis) [B] divided by total credit extended to corporates from all sources. Source: BIS IBS, BIS IDS and BIS long time series for domestic credit.	0.179	0.143	0.144	62
Intermediation and Internationalization						
Banks *Source/ currency*	*US$ bank liabilities/total liabilities[4]*	Banks' US$ liabilities vis-à-vis other banks divided by total liabilities from all sources. Domestic and foreign sources. All instruments Source: BIS IBS.	0.058	0.051	0.042	66
	US$ NBFI liabilities / total liabilities[4]	Banks' US$ liabilities vis-à-vis NBFIs divided by total liabilities from all sources. Domestic and foreign sources. All instruments Source: BIS IBS	0.017	0.009	0.016	63
Source / counterparty location	*Bank cross-border liabilities / total liabilities*	Banks' cross-border liabilities vis-à-vis other banks divided by total liabilities from all sources. All instruments. Source: BIS IBS	0.138	0.11	0.061	66
	NBFI cross-border liabilities / total liabilities	Banks' cross-border liabilities vis-à-vis NBFIs divided by total liabilities from all sources. Source: BIS IBS	0.041	0.03	0.037	66
Instrument / currency	*Loans / US$ liabilities*	Local and cross-border US$ loans from all sectors divided by total US$ liabilities (i.e., in loan and other debt instruments). Source: BIS IBS	0.733	0.746	0.14	66

Instrument / counterparty location	*Loans / cross-border liabilities*	Loans from cross-border sources divided by all liabilities from cross-border sources (both from all sectors). Source: BIS IBS	0.702	0.734	0.188	66
Corporates *Source / currency*	*US$ bank liabilities/total liabilities*[4]	US$ claims by local and cross-border banks on corporates divided by total credit extended to corporates from all sources. Source: BIS IBS and BIS long time series for domestic credit	0.037	0.023	0.032	48
Source / counterparty location	*Cross-border bank liabilities/ total liabilities*	Claims by cross-border banks on corporates divided by total credit extended to corporates from all sources. Source: BIS IBS and BIS long time series for domestic credit	0.061	0.055	0.037	62
Instrument / currency	*Loans / US$ liabilities*[4]	Local US$ loans by banks on corporates plus US$ loans from cross-border banks to corporates divided by total corporate US$ liabilities [see [A] above]. Source: BIS IBS and IDS.	0.442	0.44	0.18	49
Instrument / counterparty location	*Loans / cross-border liabilities*	Loans by cross-border banks on corporates divided by total liabilities from cross-border sources [see [B] above]. Source: BIS IBS and IDS.	0.314	0.287	0.195	66

Table B2 – Additional Data and Summary Statistics

Variable	Construction/Sources	Means	Median	S.D.	Obs.
Country-sector approach (equation (2))					
Stress	Log change in CDS over the *Covid Shock* (from 1 January to 23 March). Sources: See Online Appendix A	0.812	0.823	0.418	66
New covid cases per 100k	Average cases in the two weeks between 10 March and 23 March. Source: Haver.	1.598	1.292	1.739	66
Country-sector-time approach (equation (3))					
Stress	Log change in daily CDS. Sources: See Online Appendix A	0.014	0.001	0.047	3,696
New covid cases per 100k	Daily Covid cases per 100 thousand inhabitants. Source: Haver.	0.275	0	0.892	3,696
Δvix	Daily growth rate in VIX. Source: Datastream.	0.039	0.002	0.147	3,696
RORO index	Risk-on-risk-off index (Chari et al., 2020). Daily index includes: ICE BofA BBB Corporate Index Option-Adjusted Spread for the United States and the Euro Area; Moody's BAA corporate bond yield relative to that for 10-year Treasuries; daily returns on the S&P 500, STOXX 50, and MSCI Advanced Economies Index; option implied volatilities from the VIX and the VSTOXX; G-spread on 2-, 5-, and 10-year Treasuries; TED spread; 3-month LIBOR-OIS spread; bid-ask spread on 3-month Treasuries; trade-weighted US Dollar Index; and the spot gold price change. Each of these components of the index are normalized such that positive changes in the index imply risk-off behavior, and their respective historical standard deviations scale the normalized changes. Then the first principal component is extracted and used to compute the z-score, which serves as the RORO measure.	0.932	0.041	2.728	3,762
ΔCountry-specific equity (MSCI) volatility	Daily growth rate in (realized) volatility of country-specific stock returns, measured based on the MSCI country indices. Volatility is calculated as the standard deviation of daily returns over rolling 22-working day (i.e., 1 month) periods on a daily measure.	0.034	0.006	0.105	3,591

Online Appendix C: Additional Analysis

Table C1 – Sectoral dummies and Covid controls

	(1)	(2)	(3)	(4)	(5)	(6)
sector_bank	-0.31***		-0.37***	-0.19		-0.37*
	(0.09)		(0.11)	(0.15)		(0.19)
sector_corp		0.05	-0.12		-0.16	-0.31*
		(0.10)	(0.12)		(0.15)	(0.17)
New Covid Cases per 100k*sector_bank				-0.06		0.01
				(0.04)		(0.06)
New Covid Cases per 100k*sector_corp					0.13**	0.13*
					(0.05)	(0.07)
Observations	66	66	66	66	66	66
R-squared	0.54	0.44	0.55	0.55	0.51	0.61
Number Countries	25	25	25	25	25	25
Adjusted R-squared	0.252	0.0893	0.256	0.257	0.178	0.311

Notes: The table shows the estimated parameter values from a panel regression of equation (2). All columns include country and sector fixed effects (in the form of bank and corporate sectoral dummies *sector_bank* and *sector_corp* respectively). Standard errors are clustered at the country level. The dependent variable measuring financial stress is the log change in sector-specific CDS during the *Covid Shock* (Jan 1 to Mar 23, 2020). See Online Appendix Table B for detailed definitions, sources and sample statistics for each variable.

Online Appendix D: Construction of Policy Response Variables

The IMF database in Kirti et al. (2022) contains two policy variables that are highly relevant for our empirical analysis but their original coding does not distinguish between tightening and loosening: "*27. market_based_measure*" (= Market-Based Measures) and "*28. NBFI*" (= Non-Bank Financial Institutions). To be able to use these variables consistently with other policy variables in our analysis, we code their direction based on the event description in the IMF database and, if more information is needed, on the basis of the linked background documents.

Our central guiding principle is that we code a policy action as a "loosening" ["tightening"] if a policy action *eases [increases]* today's challenges for an institution (for NBFI) or of a market participant (for market based measures) at the cost [benefit] of increasing [decreasing] the challenges of either (i) another entity today (e.g., the customer, the regulator, a counterparty) or (ii) of the same entity in the future.

Consider the following example: E.g., the policy action "*EIOPA [European Insurance and Occupational Pensions Authority] recommendations on supervisory flexibility regarding deadlines of supervisory reporting and public disclosure by insurers*" (recorded for the variable NBFI in Austria on 20 March 2020). This suggests that the regulator offers operational relief to the regulated entities by allowing delays in reporting and public disclosure standards. Hence, this policy action eases the impact on the personnel and financial resources of the regulated entity today, but possibly at the cost of lowering the regulatory standards in the sector, which might complicate the work for the regulator contemporaneously (e.g., who now faces data gaps) or negatively affect the work of the regulated entity in the future (e.g., investors may be more cautious due to the reduction in transparency).

Typical policy actions included in the NBFI variable are related to modifying reporting requirements, providing instructions on how to handle customer claims during the pandemic, and placing restrictions on share buy backs and dividend payouts for insurance companies.[14] For the market-based measure variable, common policy actions include modified reporting requirements as well as bans on short-selling. We exclude a small number of policies that are very unlikely to have any impact on CDS prices, e.g., the policy action "*Clarification of issues related to the application of MiFID II requirements on the recording of telephone conversations*" (recorded for the variable market-based measures, Spain, 20 March 2020) appears to merely modify previously issued guidelines on the recording of phone conversations.[15]

[14] In line with the guiding principle above, restricting share buy backs and dividends eases the challenges of the regulated entity today (i.e., through an increase in retained earnings) but could come at the costs of increased challenges in the future (i.e., investors may be more hesitant to invest in the company if the stock performs poorly or may not pay a dividend).

[15] While this minor modification of an already small policy action is unlikely to have any detectable impact on CDS prices, there are good reasons to still include seemingly smaller policy actions in the analysis. For example, instructions by the regulator to conduct audits in a virtual setting instead of in-person could reduce the level of thoroughness with which the audit is conducted, impact personnel and financial resources of the regulated entity, and increase the possibility of legal challenges in future.

Table D1: Summary Statistics and Data on Policy Responses

Variable	Variable in Kirti et al. (2022)	Description based on Kirti et al. (2022)	Mean	Med.	S.D.	Min	Max	Obs.
Non-Bank Financial Intermed-iation (NBFI) Policies	*NBFI* with a directional coding. (Dummy)	All prudential measures applied to non-bank financial institutions. Actions unrelated with prudential regulations are not included. We add a directional coding to the variable from Kirti et al. (2022).	0.0472	0	0.2546	-1	1	5,444
Market-Based Measures (MBM)	*market_based_measure* with a directional coding. (Dummy)	Regulations on financial market participants or recommended actions in response to Covid, such as rules on short selling, security issuance, reporting, etc. We add a directional coding to the variable from Kirti et al. (2022).	0.0068	0	0.2495	-1	1	5,444
US$ Swap Lines	*swap_line* but only cases related to US$ swap lines. (Dummy)	Swap lines between central banks. Kirti et al. (2022) only record swap lines for the counterparty with a relatively greater need for foreign exchanges. If relative need cannot be determined, they record the measure for both sides. We focus only on US$ swap lines in our analysis.	0.0173	0	0.1303	0	1	5,444
Prudential Regulations	*prudential* (Dummy)	Summary measure of all prudential policies in Kirti et al. (2022). Sign of the sum of all policy dummies in this category, which covers: prudential buffers, buffer usability, capital requirements, dividend restrictions, special provisioning rules, borrower-based measures, supervisory expectations, lending standards, reporting requirements, liquidity requirements, and other.	0.0952	0	0.2934	0	1	5,444
Macropru-dential Buffers	*pru_buffer* (Dummy)	Three specific buffers are included: the countercyclical capital buffer (CCyB), the capital conservation buffer (CCoB), and the systemic risk buffer (SyRB). Sizes are actual buffer changes. Therefore, as is often the case, if a measure is to postpone scheduled future buffer changes, Kirti et al. (2022) recognize the measure but code its size as missing. If different banks are subject to different buffer changes, Kirti et al. (2022) choose one that affects most banks for CCyB and CCoB and take a simple average for SyRB.	0.0145	0	0.1196	0	1	5,444
Policy Rate Changes	*pol_rate_size (rescaled to percentage points)*	Changes in the policy interest rate. An announcement of no change or a speech on the expected rate path is not considered an actual policy. If a central bank uses multiple interest rates, Kirti et al. (2022) select the one that is most related to lending as the policy rate and include changes to other interest rates under the "other rates". Once Kirti et al. (2022) select the policy rate, they do not change it for consistency.	0.0038	0	0.0527	-0.79	1	5,444
Asset Purchases	*APP_gdp (rescaled to share of GDP)*	Purchases of securities, such as bonds, stocks, and commercial paper in the secondary market by the central bank. The intention should not be only to improve short-term market liquidity.	0.0006	0	0.0059	0	0.099	5,444
Market Liquidity Policy	*market_liquidity* (Dummy)	Short-term lending or interventions in asset markets, with the explicit and sole intention of improving short-term market liquidity. Kirti et al. (2022) determine the intention of a measure based on its stated aim as well as any relevant context.	0.005	0	0.0703	0	1	5,444
Fiscal Policy	*broad_fiscal_gdp (rescaled to share of GDP)*	Summary measure of all fiscal policies in Kirti et al. (2022). Sign of the sum of all policy dummies in this category, which covers: grants, tax reliefs, tax referrals, equity participation, public loans, public guarantees.	0.0015	0	0.0105	0	0.159	5,444