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Fiscal stimulus and commercial bank lending under COVID-19

Joshua Aizenman, Yothin Jinjarak, and Mark M. Spiegel[1]

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Abstract

We investigate the implications of extra-normal government spending under the COVID-19 pandemic for commercial bank lending growth between 2019Q4 and 2020Q4 in a large sample of over 3000 banks from 71 countries. We control for pre-pandemic structural factors, bank characteristics and government debt. To address the likely endogeneity of government assistance under the pandemic, we instrument for extra-normal spending using disparities in pre-existing national political characteristics for identification. Our results indicate that while higher government spending was associated with higher commercial bank lending, higher public debt going into the crisis weakened the expansionary effects of higher spending on bank lending at economically and statistically significant levels. Moreover, this sensitivity is higher among weaker banks, suggesting that bank lending responses to government spending under COVID-19 reflected the perceived implications of such spending for government assistance of the banking sector going forward. Our results are robust to a variety of sensitivity analyses, including perturbations in specification, sample, and estimation methodology.

JEL Classification: G21, E62, F34, H30

Keywords: fiscal multiplier, COVID-19, bank lending

[1] Olivia Lofton provided excellent research assistance. Our views are our own and do not necessarily reflect those of the Federal Reserve Bank of San Francisco or the Board of Governors.

1. Introduction

The COVID-19 pandemic raised the need for elevated government spending to fight the virus outbreak and to stabilize national economies. This resulted in sizable increases in fiscal outlays, and greater liquidly support of households, businesses, and banks. As noted by IMF Chief economist Gopinath, "The considerable global fiscal support of close to $12 trillion … helped saved lives and livelihoods and prevented a financial catastrophe" [Gopinath (November 2020)]. Moreover, the memory of the recent Global Financial Crisis motivated unprecedented institutional support for an aggressive response to the crisis [Segal (2021)].

Notably, at the arrival of the pandemic many national government balance sheets were in challenging positions, in part due to Global Financial Crisis (GFC) which occurred a little more than a decade previously. As shown in Acharya et al. (2014), the GFC and the euro area crisis which followed shortly afterwards were associated with a 'doom loop' between banks and their sovereigns in heavily-indebted countries. Specifically, as governments responded to distressed financial sectors by providing assistance, the cost of those bailouts increased national sovereign risk and further weakened the financial sector by eroding the value of government guarantees and bank bond holdings.[2] This experience highlights the risk of fiscal assistance given high government debt positions. Under high sovereign indebtedness, while commitments of resources provide initial assistance in alleviating short-term funding challenges, they further increase public debt overhang and may ultimately raise sovereign spreads and financial fragility.

In this paper, we investigate the relationship between expansionary COVID-related fiscal spending, measured as spending above normal levels relative to gross domestic product, and bank

[2] Acharya, et al (2014) identify a positive correlation between post-bailout movements in sovereign CDS spreads and changes in bank CDS spreads, even after controlling for aggregate and bank-level determinants of such credit spreads. They interpret this correlation as confirmation of the sovereign-bank "doom-loop" hypothesis.

lending growth. Our primary focus is the impact of national fiscal positions going into the crisis on the efficacy of this relationship. The COVID-19 crisis provides a useful experience in which to examine the link between fiscal policy and private sector activity, as represented by bank lending growth, due to the exogenous nature of the COVID crisis that triggered the ensuing fiscal response.

Our analysis is a large cross-section of approximately 3000 banks from 71 countries. We condition for disparities in individual bank and country characteristics going into the crisis based on data for 2019Q4. Our banking data includes balance sheet and income statement information taken from the Fitch Global Banking database. Importantly, we also control for disparities in country characteristics, including both the severity of the crisis and the government debt position going into the pandemic. Public debt/GDP has been commonly used as an indicator of fiscal space (e.g. Ostry et al. (2010)), and in particular may provide information about the willingness or capacity of the government to provide assistance to the banking system in future periods of distress.[3]

Our specification also pays attention to endogeneity concerns, as it is quite possible that countries that experienced more severe COVID responded with both greater lockdowns—which adversely impacted on activity and bank lending--and more assistance spending to alleviate the adverse implications of those lockdowns. In response, we turn to instrumental variables estimation based on the existing national political environment. We use as instruments four political indicators, including indicators of political rights, government effectiveness, the existence of a Presidential system of government, and a measure of the durability of a nation's political regimes. Specification and measurement of these are discussed below, and diagnostic tests reject any weak instrument problem.

[3] Ostry et al. (2010) estimates of fiscal space depend on the debt/GDP projected, and estimated debt limit, which depends on the country's historical track record of primary balance adjustment to rising debt. In this context, Mian et al. (2014) show that following a financial crisis, voters become more ideologically extreme and ruling coalitions become weaker, raising the difficulty of resolving debt-overhangs and reducing the likelihood of future bailouts. Relatedly, Cukierman and Izhakian (2015) showed that increases in bailout uncertainty can raise both interest rates and defaults.

We find that while higher government spending was associated weakly with higher commercial bank lending, higher public debt going into the crisis weakened the expansionary effects of higher spending on bank lending at economically and statistically significant levels. Moreover, sensitivity analysis demonstrates that a sub-sample of weaker banks, proxied by higher bad loan shares, exhibited greater sensitivity than their stronger counterparts, although our standard errors are too large for this difference in sensitivity to be established with statistical significance. We also find that the negative relationship between growth in lending by banks in countries and high spending and government debt levels was more pronounced for the medium and smaller banks in our sample.[4] Finally, after accounting for this heterogeneity in sensitivity to extra-normal fiscal expenditures, we find that bank lending growth is increasing in extra-normal fiscal spending, although not always at statistically significant levels. Our results are robust to a variety of sensitivity analyses, including perturbations in specification, sample, and estimation methodology.

We interpret these results as suggesting that bank lending responses to government spending under COVID-19 reflected the perceived implications of such spending for government assistance of the banking sector going forward, which was negatively related to the severity of a nation's fiscal challenges.

The remainder of this paper is organized into 7 sections. The following section reviews the literature on fiscal policy and bank lending, paying special attention to studies focusing on the COVID-19 pandemic. Section 3 introduces the data set and examines some univariate correlations between the variables of interest in the study. Section 4 introduces our parametric specification and illustrates our identification strategy. Section 5 reviews our base specification results. Section subjects those results to a battery of robustness tests. Lastly, Section 7 concludes.

[4] While we do not directly consider cross-border funding, this result is in line with Cetorelli and Goldberg (2012), as smaller banks are less exposed to cross-border funding opportunities and may not benefit from the more elastic public backstopping provided in times of peril to 'too big to fail' institutions.

2. Literature on government spending and bank lending under the COVID-19 crisis

2.1. Fiscal space and government spending multipliers

A large literature has emerged examining various determinants of fiscal spending under the COVID-19 pandemic. Auerbach et al. (2021) uses detailed regional variation in economic conditions, lockdown policies, and U.S. government spending, and find evidence of systematic time-variance in fiscal multipliers. In particular, they find that the effects of government spending were stronger during the trough of the pandemic recession, but only in cities that were not subject to strong stay-at-home orders. Their evidence therefore supports the notion that multipliers are larger in more adverse conditions but highlight the possibility that other confounding factors may limit the visibility of this phenomenon.

There also is reason to believe that the fiscal multiplier varies with government debt positions. Nickel and Tudyka (2014) investigated the impact of fiscal stimuli at different levels of the government debt-to-GDP ratio for a sample of 17 European countries from 1970 to 2010. They find that responses to government spending shocks exhibit strong nonlinear behavior. While the overall cumulative effect of a spending shock on real GDP is positive and significant at moderate debt-to-GDP ratios, this effect turns negative as the ratio increases.

The Covid-19 crisis has prompted several studies investigating the role of fiscal space in determining the efficacy of fiscal stimulus in enhancing economic activity. Augustin et al. (2021) investigated the role of fiscal space for Eurozone countries and U.S. states during the first Covid-19 year, for whom monetary policy can be held constant. They found that the sensitivity of sovereign default risk spreads to the severity of the virus was related negatively to the sovereign's fiscal position, suggesting financial markets systematically penalized sovereigns with low fiscal space during the COVID-19 pandemic.

Deb et al. (2021) examined the effects of fiscal policy measures during the pandemic, using a database of daily fiscal policy announcements-classified by type of fiscal measure-and high-frequency economic indicators for 52 countries during 2020. Fiscal policy announcements were effective in stimulating economic activity, boosting confidence, and reducing unemployment, but their effect varied by type of measure and country characteristics. Emergency lifeline measures were more effective when containment policies were stringent, providing cashflow support to firms and households. Demand-support measures were more effective when containment measures were relaxed.

Notably, concerns about fiscal space challenges may increase going forward, in tandem with rising public debts and global interest rates. This may occur due to inflationary trends or to the onset of economic recovery in the US and other OECD countries that may put upward pressure on sovereign spreads of middle income and developing nations. This risk was contained during the first covid-19 waves by the policies of the major central banks and international financial institutions, although emerging market and developing economies remain considerably exposed. As global rates increase, fiscal space could fall sharply with increases in the public debt burden.

2.2. Global disparities in fiscal policy responses and bank lending under COVID-19.

Large disparities in fiscal and monetary policy responses across countries to the COVID-19 pandemic have been identified in the literature. Benmelech and Tzur-Ilan (2020) find that during the initial covid-19 waves for 35 advanced economies and 50 emerging market and developing economies high-income countries announced larger fiscal policy responses. Moreover, they found that country credit ratings were the most important determinant of pandemic fiscal spending. These observations are consistent with earlier research showing that countercyclical fiscal policies are not common in countries with high credit risk and are less prevalent among emerging markets and developing economies [e.g. Bianchi et al. (2019) and Talvi and Vegh (2005)].

A number of papers also have emerged examining disparities in financial sector performance during the COVID-19 pandemic. Çolak and Öztekin (2021) find that bank lending was weaker in countries that were more affected by the health crisis during the initial waves of the pandemic from 2020 Q1 through Q3. This effect depends on the health of the banking system, market structure, the regulatory and institutional environment, the sophistication of the financial sector, the ease of access of corporate firms to debt capital, and the response of the public health sector to the COVID-19 crisis. They identify a positive correlation between fiscal stimulus and bank lending under the pandemic.[5]

Access to private funds also influenced bank lending patterns. Focusing on the US, Li et al. (2020) found that at the on-set of the crisis, firms drew down on a massive scale from pre-existing credit lines in anticipation of cash flow and financial disruptions stemming from the advent of the COVID-19 crisis. This increase in liquidity demands was concentrated among the largest banks. Inflows of funds from both the Federal Reserve's liquidity injection programs and depositors, along with strong pre-shock bank capital, also helped US banks (who are not part of our sample) accommodate their liquidity needs.[6]

Finally, financial conditions also play an important role in determining lending levels. Lopez and Spiegel (2021) and Anbil, et al (2021) demonstrate that the Federal Reserve Paycheck Protection Program Lending Facility was successful in encouraging banks to book a greater share of their lending under the Paycheck Protection Program, which encouraged continued small business lending. Spiegel (2022) demonstrates that foreign bank lending growth in the United States was positively associated with lower and negative home country rates, indicating the presence of global monetary policy spillovers.

[5] Çolak and Öztekin measure fiscal stimulus as a 0-1 qualitative variable indicating above-average spending under the pandemic.

[6] We exclude US banks because they comprise over half of the observations obtainable under the Fitch data set to maintain a sample with substantive variability in domestic fiscal policy.

3. Data

Our sample is a large cross-section of over 3,000 commercial banks. Our observations come from 71 countries, including 36 high-income, 16 upper-middle-income, and 17 lower-middle-income, and 2 low-income economies.[7] To guard against difficulties associated with endogeneity, explanatory variables are collected prior to the onset of the pandemic, at dates indicated in more detail below.

Our bank data consists of balance sheet and income statement variables for individual banks, taken from the Fitch Global Banking database.[8] Pre-pandemic data on bank characteristics are taken from 2019Q4, and lending growth is calculated based on annual changes from 2019Q4 through 2020Q4 to avoid issues associated with seasonality.

Our large sample of banks allows us to examine disparities in the effects of government pandemic assistance on bank lending across several dimensions, such as size and deposit-reliance. Following Lopez and Spiegel (2021), we separate reporting banks into three groups based on asset size in 2019Q4, i.e., small banks with assets below $10 billion, large banks with assets exceeding $100 billion, and a middle category between them. Our base specification contains 3,297 banks, of which 2,422 are classified as small banks, 690 are medium-size banks, and 185 classified as large banks. Following Lopez, et al (2020), we designate a bank as high deposit if its deposits comprise 75% or more of total funding.

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[7] More detail on sources and definitions of data used can be found in Appendix Table A1. We exclude banks from the United States, as those would comprise well over half of our sample. We generally use unconsolidated data, only relying on consolidated data if banks fail to report unconsolidated statistics.

[8] Fitch sources its data through financial statements "… directly through web crawlers, alerts, by direct request and data feed." See https://app.fitchconnect.com/support for more detail. We remove a number of categories of non-banks from the original Fitch data set, including branches, bond banks, securities brokers, other brokerages, credit card banks, leasing subsidiaries, and factoring subsidiaries. To ensure a homogeneous set of private commercial banks, we also remove institutions designated as government sponsored enterprises.

Over 74% of banks in our base regression sample are designated as high deposit under that definition.[9]

Our dependent variable is growth in bank lending, *GLOAN*, between 2019Q4 and 2020Q4. In addition to country-specific indicators discussed below, we account for differences in individual bank characteristics going into the COVID period. Other research has demonstrated the importance of conditioning for disparities in bank characteristics in explaining bank behavior or performance during the pandemic. For example, Cornett et al. (2011) showed that financially constrained banks were more limited in their credit extension during the global financial crisis.

Our base specification includes five individual-level bank conditioning variables. We include *LGLOAN,* the lagged growth in bank lending over the previous year to control for bank lending growth trends, *BADL,* the ratio of problem loans to total assets, as an indicator of the quality of bank lending; *CASH,* the ratio of bank cash holdings to earning assets, as an indicator of bank balance sheet liquidity; *EQUI,* the ratio of bank equity to total assets, as an indicator of bank leverage; and *DEPO,* the ratio of bank deposits to total funding, as an indicator of bank reliance on conventional funding. We also examine some available alternative measures in our robustness tests below. These additional bank-level measures include *SIZE*, the total assets in billion US$, as an indicator of the bank size; *CAPR*, the Tier 1 capital to risk-weighted assets, as a measure of capital adequacy;[10] and *LEVR*, the leverage ratio measured as the capital divided by total assets, as a measure of bank's near-term financial health.

We draw on several macroeconomic controls for the analysis. To assess the fiscal spending during COVID-19, we use above-the-line fiscal spending in % of GDP, *SPND* (COVID-19 Fiscal Spending) from Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic. This

[9] We also follow Lopez, et al (2000) in using the more common accounting method used in its home country when confronted with bank data reported under multiple accounting methods and in dropping banks that use unconventional accounting systems, defined as an accounting system used in less than 10% of reported data in a bank's home country.

[10] Crosignani (2021) provides a model where the sovereign debt capacity depends on the capitalization of domestic banks..

variable sums the additional spending or foregone revenues, covering health and non-health sectors, excluding accelerated spending and deferred revenue. Countries' responses vary depending on country-specific circumstances, including the impact of the pandemic and other shocks. Also, estimates are reported as preliminary, as governments are taking additional measures or finalizing the details of individual measures. Despite these limitations, *SPND* provides a measure of government discretionary measures that supplement existing automatic stabilizers, which tend to differ across countries in their breadth and scope.

Our fiscal indicators and other country-level controls are drawn from national authorities and international organizations via Thomson Reuters Eikon. We consider as a stock measure of government indebtedness *DEBT*, the public debt/GDP ratio. An additional variable of interest below is the interaction of our measure of public debt with the spending indicator, *DEBTxSPND.* Our estimation also controls for *GGDP*, GDP growth, and *POPN*, the size of population.

To control for the severity of COVID-19, we use an estimate of excess deaths (per million population), *CV19*, from the Economist's Global Excess Deaths model. This measure represents the number of excess deaths, from all causes, during the COVID-19 pandemic. We consider this measure preferable to official COVID-19 mortality statistics which have proven prone to misreporting. However, expected deaths are subject to uncertainty, and so the model statistics are reported with confidence bands. We use the midpoints of these excess death confidence bands as our estimates.[11]

Finally, as discussed above, we use measures of country political characteristics as instruments for the likely-endogenous intensity of the fiscal spending response. These include *POLR*, the political rights, which is an index from Freedom House, re-scaled to (0,1), where the higher value corresponds to the higher degree of political freedom; *DURA*, the regime durability, which is the number of years since

[11] The modeling of excess deaths involves comparing all deaths recorded with those expected to occur, and therefore is subject to estimation errors. The confidence intervals surrounding the reported statistics can be sizable for some countries.

the most recent regime change as of 2018 from the Quality of Government Basic Dataset; and *GVEF*, the government effectiveness, which is an index from International Country Risk Guide (2019), with the values from 0 to 1 where a higher value corresponds to higher government effectiveness; and *PRES*, the presidential system, equals to 1 if a country has the presidential system and 0 otherwise, from the Database of Political Institutions.

These political variables assist our first-stage estimation in determining the size of COVID-19 spending and the pre-pandemic public debt levels in the cross-country sample. There are a number of channels identified in the literature through which a country's political regime could influence its COVID-19 spending response. First, it may affect the cost of a given response. Qi et al. (2010) find that high levels of political rights are negatively associated with spreads of corporate bonds issued in 39 countries. They suggest that political rights allow for greater freedom of the press, which in turn reduces bond risks.

Second, enhanced political rights may encourage a more aggressive fiscal response to the pandemic. Fortunato and Loftis (2018) demonstrate that short durations in parliamentary democracies increase public spending by driving a political budget cycle. Examining 15 European democracies over several decades, they find that governments increase spending as their expected duration declines.

Third, domestic politics may affect the efficiency of the government, which may influence the chosen aggressiveness and eventual implementation of the pandemic response. Heylen et al. (2013) assess the evolution of the ratio of public debt to GDP during 132 fiscal episodes in 21 OECD countries in 1981–2008. They find that a given consolidation program will be more effective in bringing down debt when it is adopted by a more efficient government apparatus, and more efficient governments adopt consolidation programs of better composition. For the pandemic period, the effects of government effectiveness should be at work even more prominently on the fiscal spending during the COVID-19 crisis, and the interactions of the public-debt levels with the fiscal spending during the COVID-19 crisis,

both of which can be considered as endogenous regressors in the main estimation.

Our country grouping is based on the latest classification of income and geographic regions from World Bank: *HIC* for high-income countries; *UMC* for upper-middle income; and *LMIC* for lower-middle and low-income countries. We also supplement the analysis with the IMF's classification to identify emerging market and middle-income economies not classified as advanced economies or low-income developing countries, and the list of Euro membership. The bank-level and country-level observations are combined using 2-digit and 3-digit country letter codes in the respective datasets.

The list of countries, their average bank lending growth in 2020, and the numbers of banks included are in Appendix Table A2. We winsorize all variables at a 1% level to mitigate the influence of outliers. Standard errors are clustered by country unless indicated otherwise. Table 1 reports the summary statistics for the dependent variable and our variables of interest, *GLOAN*, *SPND*, *SPNDxDEBT*, and *DEBT*. In 2020, the mean bank lending growth is 5.6%. There is a large variation in lending, from -19.4% to 30.8%, with a standard deviation of 8.1%, driven partly by banks in the upper middle-income countries, banks with assets less than $100B, and banks with deposits/total funding lower than 0.75 (Appendix Table A1 provides the summary statistics for sub-samples).

Table 1. Summary Statistics.

	Mean	SD	Min	Max
GLOAN	5.691	8.115	-19.459	30.879
SPND	10.238	5.408	0.654	19.27
SPNDxDEBT	10.284	11.686	0.349	39.381
DEBT	.836	.627	0.138	2.354

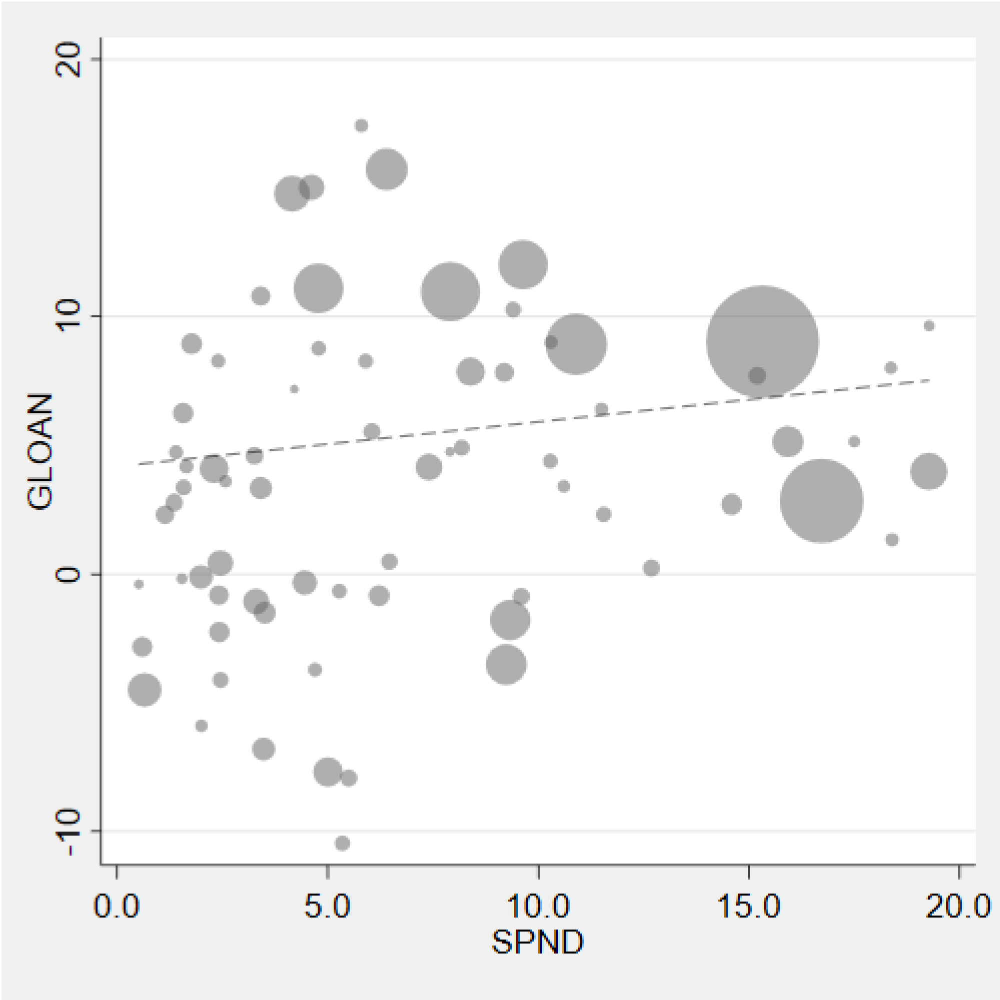
Note: Summary statistics for variables of interest in base specification sample. See text for variable definitions.

There is also a lot of variability in fiscal support in our sample. The size of above-the-line spending since COVID-19 has a mean of 10.2% of GDP. Some countries have spent close to a fifth of

GDP, while excess spending by others is less than a percentage point, with a standard deviation of 5.4% of GDP. Given the public debt/GDP average of 0.8 with a standard deviation of 0.6, the wide variation in scope and size of COVID-19 fiscal spending interacting with the public debt should prove useful in identifying the effects of fiscal challenges on bank lending growth.

Univariate patterns consistent with those in our parametric results below appear in our raw data. Figure 1 plots bank lending growth (%) against COVID-19 fiscal spending/GDP (%) for the countries included in our base sample, with circle sizes representing the number of banks per country. Note that

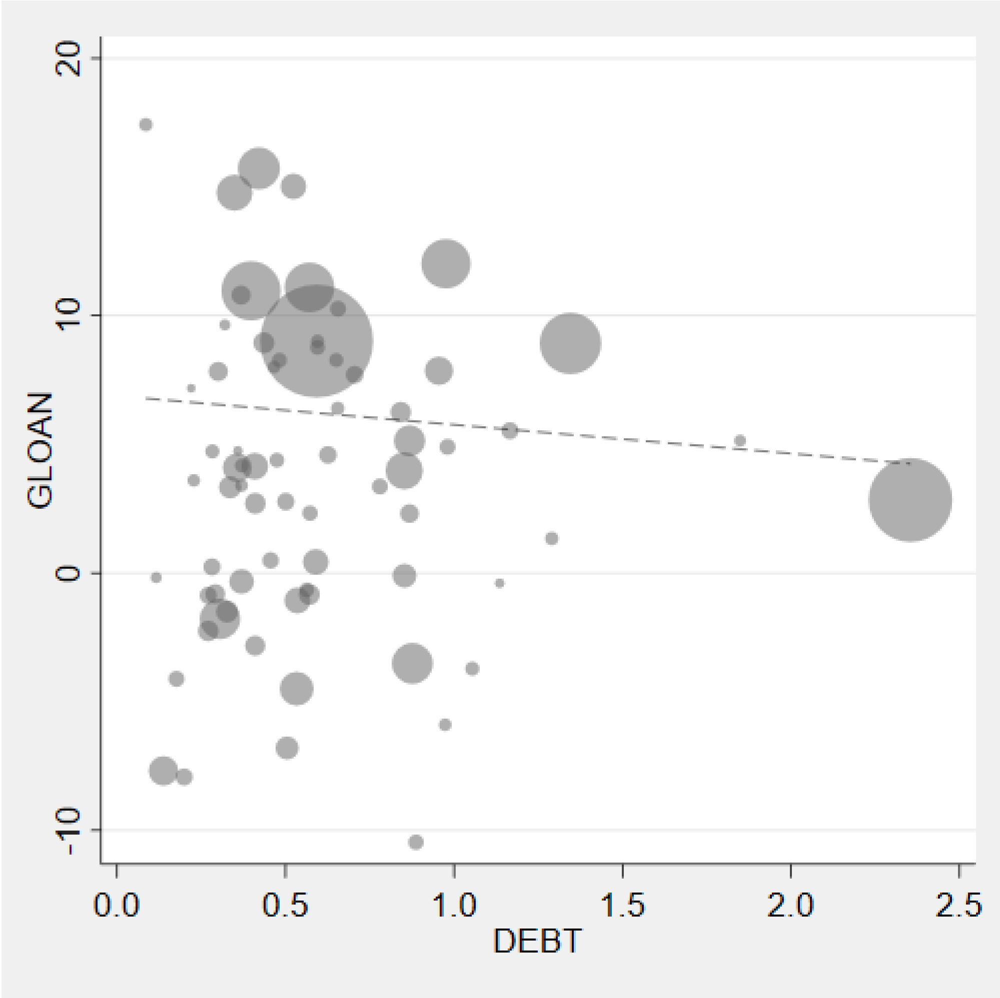
Figure 1. Bank Lending Growth (%) and COVID-19 Fiscal Spending/GDP (%).



Note: Authors' calculation on bank loans from Fitch Solutions and above-the-line fiscal spending from IMF COVID-19 Tracker. Bubble's size and the fitted line are weighted by the frequency of observations at the level of 2020 above-the-line spending/GDP.

the two large circles on the far right denote banks from Germany (the largest bubble) and banks from Japan (the second largest circle). We also show a fitted line based on the univariate relationship between the two variables, again based on individual bank observations. The sample correlation between the bank lending growth and the COVID-19 fiscal spending is 0.24. The patterns suggest that government pandemic spending encourages lending growth by banks, with our point estimate (a

Figure 2. Bank Lending Growth (%) and Public Debt/GDP.



Note: Authors' calculation on bank loans from FitchSolutions and national statistics on public debt to GDP. Circle sizes and the fitted line are weighted by the frequency of observations at the level of 2019 public debt/GDP.

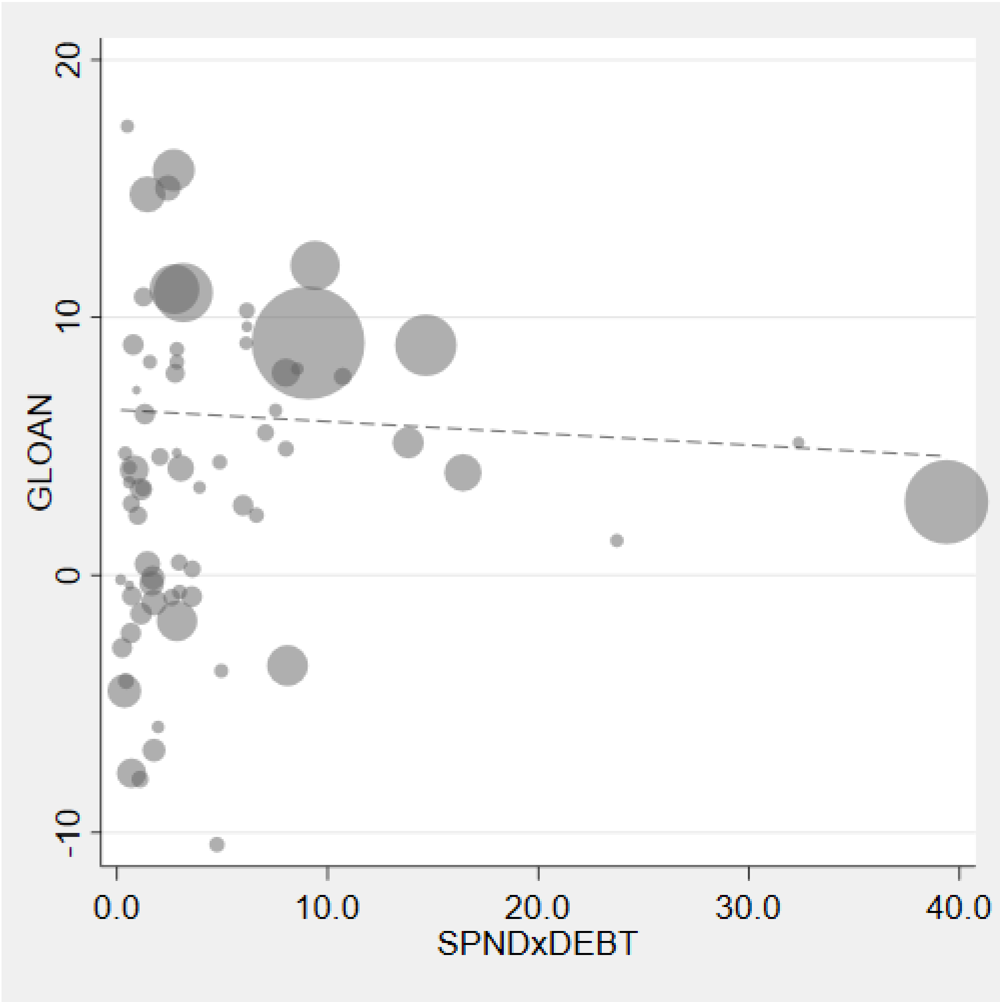
bivariate estimation coefficient of 0.17 with a standard error of 0.01) indicating that a one standard deviation increase in above-normal fiscal spending (5.21% of GDP) is predicted to be associated with a 0.88 = (5.21*0.17) percentage point increase bank lending growth.

Figure 2 similarly displays the univariate relationship between bank lending growth (%) and public debt/GDP. Our fitted line suggests that high government debt positions are a drag on lending growth during the pandemic, with our point estimate (a bivariate estimation coefficient of -1.12, with a standard error of 0.15) indicating that a one standard deviation increase in the debt/GDP position (0.38) is predicted to be associated with a -0.42 = (-1.12*0.38) percent decline in bank lending on average under the pandemic. However, it can also be seen that Japanese banks are influential in our sample, due to the high debt/GDP ratio prevailing in Japan relative to other countries during the pandemic. We examine this more clearly below.

Figure 3 then shows the relationship between bank lending growth (%) and the interaction of COVID-19 fiscal spending/GDP (%) and public debt/GDP. Larger levels of both COVID-19 fiscal spending and public debt are shown to be associated with lower bank lending growth during the pandemic, holding all else equal. Our point estimate for the fitted line (a bivariate-regression coefficient of -0.045, with a standard error of 0.008) predicts that a one standard deviation increase in the interactive term (6.85) is associated with a -0.31 = (-0.045*6.85) percent decline in bank lending growth. Again, however, banks from Japan, shown on the large far-right bubble, appear to influence the overall pattern of the relationship.

Overall, our raw data suggests that above-normal fiscal spending during the pandemic is associated with bank lending growth, while high debt levels going into the pandemic were associated with lower lending growth, holding all else equal. In addition, we find a negative univariate relationship

Figure 3. Bank Lending Growth (%) and the Interaction of COVID-19 Fiscal Spending/GDP (%) and Public Debt/GDP. Lower bank lending growth with larger COVID-19 fiscal spending and public debt.



Note: Authors' calculation on bank loans from FitchSolutions, above-the-line fiscal spending from IMF COVID-19 Tracker, and national statistics on public debt to GDP. Bubble's size and the fitted line are weighted by the frequency of observations at the value on horizontal axis (the product of above-the-line spending/GDP and public debt/GDP).

between lending growth and the interaction between above-normal fiscal spending and the sovereign debt burden going into the pandemic. In the next section, we move to test these relationships parametrically to examine their robustness to conditioning for disparities in bank and country characteristics.

4. Methodology

4.1 Identification

Our primary interest is in the impact of *SPND,* government spending above normal under the COVID-19 pandemic as a share of GDP, on bank lending growth, both on its own and interacted with the government's debt position as a share of GDP going into the pandemic, *DEBT.* As discussed in the previous section, we avoid endogeneity issues in the debt variable by using values as of end-2019. However, we are concerned about the potential for endogeneity in our spending variable, as it is quite possible that countries that experienced more severe incidence of COVID responded with greater lockdowns and more assistance spending to alleviate the adverse implications of those lockdowns. As our interactive term *SPNDxDEBT* also includes the likely-endogenous variable *SPND,* we treat it as endogenous as well and require at least two instruments.

In response, we turn to instrumental variables estimation. We consider it quite likely that all else equal, the political environment will influence the amount of government assistance spending undertaken. We therefore use the four political variables discussed above as instruments. A priori, we would expect that enhanced political rights, *POLR,* or government effectiveness, *GVEF,* would be associated with higher levels of government spending, as both would be associated with more intense responses to the pandemic, holding all else equal. We are more agnostic about the expected signs for *PRES,* the existence of a Presidential system of government, and *DURA,* a measure of the durability of a nation's political regimes. Our exclusion restrictions therefore require that the domestic political environment influenced bank lending growth under the pandemic solely through its influence on the fiscal response measured in our endogenous variables.

Results for the first-stage regressions of our two-stage least squares specification with standard errors clustered by country are shown in Appendix Table A3. We indeed obtain statistically significant positive coefficient estimates on the *GVEF* variable for both the *SPND* variable and that variable

interacted with the *DEBT* variable. However, the *POLR, PRES,* and *DURA* variables are insignificant at a 10% confidence level in both specifications. More importantly, we reject a weak instrument problem through a battery of tests.[12]

In addition to the strength of our instruments, concern may arise that greater incidence of the pandemic, proxied in our specification by the *CV19* variable discussed above, may have led countries more severely impacted by the *CV19* pandemic to provide greater fiscal assistance. We therefore also report regressions in appendix Table A2 of the *SPND* variable and that variable interacted with debt positions going into the pandemic on all of the conditioning variables in our specification. In particular, we find that both variables are negatively correlated with the severity of COVID-19 incidence.

4.2 Estimation

Our base specification uses two-stage least squares estimation, with the four instruments *POLR, GVEF, PRES,* and *DURA* utilized for the endogenous variables *SPND* and *SPNDxDEBT*. We run this specification with and without the interactive term, as discussed below.

The second stage of our specification with the interactive term included, which we take as our base specification, satisfies

$$GL_{ij} = c + \beta_1 SPND_j + \beta_2 SPND_j x DEBT_j + \beta_3 DEBT_j + \beta_4 X_i + \beta_5 \gamma_j + HIC_j + UMC_j + \varepsilon_{ij}$$

where

- GL_{ij} is the dependent variable representing growth in lending by bank i in country j,
- $SPND_j$ is government spending above normal as a share of GDP in country j,
- $DEBT_j$ is the debt-to-GDP prevailing in country j,

[12] F-values for the instruments in the first-stage regression are 7.14 and 8.80 for *SPND* and *SPNDxDEBT* respectively, indicating overall significance at a 1% confidence level. We obtain a Stock-Yogo weak ID test value 92.64 and an AR Wald weak instrument F-value of 3.98, both of which reject a weak instrument problem at a 1% confidence level.

- $SPND_j xDEBT_j$ is the interaction of the two previous variables,
- X_i is a vector of the bank i specific variables, *BADL*, *CASH*, *EQUI*, and *DEPO*
- γ_j is a vector of the other country j variables, including *CV19*, *POPN*, and *GGDP*
- HIC_j is a dummy variable which takes value 1 for high-income countries with income per capital exceeding X, and 0 otherwise,
- UMC_j is a dummy variable which takes value 1 for upper-middle income countries with income per capital exceeding Y and less than X, and 0 otherwise, and
- ε_{ij} represents a residual, assumed to be well-behaved subject to individual estimation details discussed below.

We have two primary coefficients of interest, $SPND_j$, the direct impact of COVID-related spending on bank lending and $SPND_j xDEBT_j$, the interactive term representing the degree to which this impact is influenced by the bank home country's debt position going into the pandemic period. Of course, we are also interested in the coefficient on $DEBT_j$, which measures the direct impact of national debt positions going into the pandemic.

5. Results

5.1 Base specification

Our base specification results are shown in Table 2, with our base specification in column 1. $SPND_j$ enters positively, but insignificantly. More importantly, our interactive variable, $SPND_j xDEBT_j$ enters significantly negative at close to a 1% confidence level. Moreover, it is illustrative to consider the two coefficient estimates simultaneously. For example, as shown in Table 1, the sample mean value of $DEBT_j$ is 83.59. It follows that for a bank in a country with the mean debt position going into the crisis, our point estimates indicate that a one-standard deviation increase in $SPND_j$ is predicted to result in a

Table 2. Base Specification.

	(1)	(2)	(3)	(4)
	1	2	3	4
SPND	0.7	-0.5*		0.4***
	(0.5)	(0.3)		(0.1)
SPNDxDEBT	-1.9**		-1.0***	-1.1***
	(0.7)		(0.3)	(0.1)
DEBT	27.5*	-2.5*	13.5**	15.3***
	(11.2)	(1.0)	(4.3)	(1.4)
CV19	-1.0	-0.7	-1.0*	-0.9***
	(0.5)	(0.7)	(0.5)	(0.1)
GGDP	0.4	-0.2	0.1	0.1*
	(0.3)	(0.2)	(0.1)	(0.1)
POPN	0.4	0.8***	0.6***	0.5***
	(0.2)	(0.1)	(0.1)	(0.0)
HIC	12.6***	11.5***	12.8***	8.6***
	(1.6)	(2.2)	(1.4)	(0.5)
UMC	2.1	-1.5	0.6	1.3*
	(2.3)	(1.6)	(1.4)	(0.5)
LGLOAN	0.3***	0.2***	0.2***	0.2***
	(0.0)	(0.0)	(0.0)	(0.0)
BADL	-20.6***	-14.1*	-18.7**	-9.0**
	(6.2)	(6.7)	(6.1)	(2.8)
CASH	0.8	-6.9**	-3.4	-0.4
	(4.0)	(2.6)	(2.6)	(1.0)
EQUI	-0.1	-0.1	-0.1	-0.1*
	(0.0)	(0.0)	(0.0)	(0.0)
DEPO	7.3**	3.5	5.6**	8.9***
	(2.4)	(1.8)	(1.9)	(0.5)
Constant	-16.7*	2.7	-7.0*	-13.0***
	(7.5)	(2.5)	(3.0)	(1.3)
R2	0.3	0.3	0.3	0.6
N	3297	3297	3297	3297

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator. Column (4) is done with the weighted least squares, with observations weighted by bank total assets.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.75 percentage point decrease in bank lending growth on average.[13] Our results therefore indicate a meaningful drag on bank lending for countries with average debt positions, and of course, this drag is predicted to be worse for banks in countries that entered the pandemic period in below-average debt positions.

Finally, $DEBT_j$ on its own enters positively and significantly at a 5% confidence level, indicating that lending growth was greater among banks in countries that entered the pandemic period with a higher debt-to-GDP ratio. This finding is somewhat surprising, but perhaps less so when again the interactive term is taken into consideration. As shown in Table 1, the sample mean value of $SPND_j$ is 10.24. It follows that for a bank in a country with the mean debt position going into the crisis, our point estimates indicate that a one-standard deviation increase in $DEBT_j$ is predicted to result in a 5.04 percentage point increase in bank lending growth on average.[14] However, it should be stressed that this is the average result. As spending increases the coefficient on $DEBT_j$ also turns negative. For example, a one standard deviation increase in $SPND_j$ reduces the point estimate of the net impact of a one standard deviation increase in $DEBT_j$ to - 01.67. For a bank in such a high government spending country, therefore, a one standard deviation increase in the initial debt position would be predicted to reduce lending by 1.05 percentage points on average. While the coefficient on $DEBT_j$ is positive, then, the negative interactive term implies that banks from countries with high values of both $SPND_j$ and $DEBT_j$ had lower lending growth on average.

Our conditioning variables tend to enter as predicted. Among the bank-specific variables, LG_i enters significantly positively at a 1% confidence level, as banks with more rapid growth in 2019 also

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[13] The standard deviation of $SPND_j$ is 5.41, so the calculation is [0.711 – (0.019x83.59)]x5.41= -4.75.

[14] The standard deviation of $DEBT_j$ is 62.67, so the calculation is [0.275 – (0.19x10.24)]x62.67 = 5.04

experienced more rapid growth on average in 2020. In contrast, $BADL_i$ enters significantly negatively, also at a 1% confidence level, as banks that entered 2020 with inferior balance sheet positions had lower lending growth on average. $CASH_i$ is insignificant, as low bank liquidity might be indicative of a lending constraint, but also could identify banks with greater willingness to maintain riskier lending practices, which would push in the opposite direction during the pandemic period. Similarly, $EQUI_i$ enters negatively significant at a 10% confidence level. As was the case with the $CASH_i$ variable, bank capital ratios may either indicate a greater capacity to increase lending, or a lower willingness to do so. Finally, $DEPO_i$ enters positively and significantly at a 1% confidence level, indicating more rapid lending growth among more conventional banks during the pandemic period.

In terms of our macro variables, $GGDP_j$ enters positively, as would be expected, but statistically insignificant. $CV19_j$ enters negatively, as expected, and statistically significantly at a 10% confidence level, indicating that greater incidence of the COVID-19 virus was associated with reduced lending growth on average.[15] Country size, as measured by POP_j, is positively associated with lending growth, but insignificant, while our wealthy country dummies, HIC_j and UMC_j both enter positively, but with the high-income group significant at a 1% level with a point estimate close to six times the size of that on the upper-middle country group, which enters insignificantly.

We next consider the two endogenous variables $SPND_j$ and $SPND_j xDEBT_j$ one at a time in columns 2 and 3. Our results indicate a negative and statistically significant direct impact of $SPND_j$ suggesting that countries which undertook larger fiscal stimulus programs under COVID-19 experienced lower bank lending growth. Moreover, our coefficient point estimate indicates that the impact is economically significant, with a one standard deviation increase in $SPND_j$ predicted to be associated

[15] This finding is consistent with those of Çolak and Öztekin (2020), who find that bank lending during the pandemic period was weaker in countries that were more severely affected by the health crisis.

with a 2.76 percentage point decline in bank lending growth on average. We also find that with the exclusion of the interactive term the $DEBT_j$ variable enters significantly negative at a 1% confidence level. Our point estimate indicates that a one standard deviation increase in $DEBT_j$ is predicted to result in a 1.57 percentage point decline in bank lending growth on average. The conditioning variable estimates tend to be similar to those in our base specification in terms of sign, although standard errors and significance can vary.

Column 3 indicates a negative and statistically significant effect of the interactive variable $SPND_j xDEBT_j$ with the individual variables excluded. Moreover, as the sample mean of the pre-determined $DEBT_j$ variable is 62.67, our point estimate for the interactive variable is also economically meaningful, with a one standard deviation increase in the $SPND_j$ variable for a country that enters the pandemic in the mean debt position predicted to be associated with a 3.39 percentage point decrease in lending growth, quite similar to the results we obtain in our base specification.

Finally, to gauge the possibility that differences in sensitivity to government spending may differ by bank size, we rerun our base specification in column 4 under weighted least squares, with observations weighted by bank total assets. Our results are qualitatively the same as those that we obtain in our base column 1 specification. In particular, combining our point estimates for $SPND_j$ and $SPND_j xDEBT_j$ we find that under weighted least squares our point estimates indicate that a one standard deviation increase in $SPND_j$ for a country that entered the pandemic with the mean sample value of $DEBT_j$ would be predicted to result in a 2.81 percentage point decline in bank lending growth on average. Consequently, while our estimated standard errors are reduced with weighted least square estimation, it would be misleading that the comparison suggests that the results are “stronger” for larger banks. Indeed, after weighing by bank size, the absolute value of our point estimate on the interactive term is reduced from 0.017 to 0.011.

4.2 Differences by income groups

Our base specification results suggested that disparities in loan growth rates existed between banks from different country income groups. We therefore separate our sample by income groups to allow for disparities by income group in sensitivity to differences in government spending programs. As above, we run each sample with and without the interactive term. As the number of banks with full data available from low-income countries is modest, we pool the sample of banks from low and lower middle-income countries.

Our results are shown in Table 3. We concentrate on the results for our variables of interest. As discussed above, the high-income sub-sample is the largest in our banking data, with 2,307 observations. Column 1 reports our results with the interactive term included. As in our full sample, $SPND_j$ enters insignificantly with a positive coefficient estimate, while the interactive term $SPND_j xDEBT_j$ is negative and significant at a 1% confidence level. Our coefficient point estimates are also very similar to those we obtain in our full sample, indicating a net decline in lending growth for a nation with the mean value of $DEBT_j$ for a one standard deviation increase in $SPND_j$. Also in keeping with our full sample results, the $DEBT_j$ variable enters positively and significantly, again with a point estimate very similar to that which we obtained for our full sample.

High-income country sub-sample results with the interactive term removed are reported in Column 2. Here again, the results are close to those in our full sample. With the interactive term excluded, we again obtain a negative and statistically significant at a 5% confidence level coefficient on $SPND_j$, indicating that government spending is a drag on bank lending growth. We also, as before, obtain a statistically significant negative coefficient estimate on $DEBT_j$, indicating that elevated government debt-to-GDP ratios dragged on bank lending as well during the pandemic period. The point

Table 3. Base Specification by Country's Income Group.

	(1) HIC	(2) HIC	(3) UMC	(4) UMC	(5) LMIC	(6) LMIC
SPND	0.6	-0.6	0.9	-1.8	-1.3	-0.6^{**}
	(0.5)	(0.3)	(4.4)	(1.6)	(1.3)	(0.2)
SPNDxDEBT	-1.8^{***}		-5.5		2.1	
	(0.5)		(9.1)		(3.9)	
DEBT	25.2^{**}	-4.1^{***}	44.9	1.9	-6.3	-2.0
	(8.4)	(0.9)	(70.1)	(7.6)	(9.6)	(2.1)
CV19	-0.5	0.5	-3.5	-4.0	0.3	0.2
	(1.0)	(1.3)	(2.9)	(2.7)	(0.5)	(0.4)
GGDP	0.6	-0.1	0.9	0.1	0.4^{**}	0.4^{***}
	(0.4)	(0.4)	(1.5)	(0.5)	(0.1)	(0.1)
POPN	3.2	7.3^{*}	-0.3	0.1	-1.0	-1.2
	(3.6)	(3.0)	(1.1)	(0.6)	(0.8)	(0.8)
LGLOAN	0.3^{***}	0.2^{***}	0.3^{**}	0.2^{**}	0.2^{***}	0.2^{***}
	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)
BADL	-19.3^{*}	-14.6	6.7	-3.4	-27.6^{**}	-26.7^{**}
	(9.4)	(10.9)	(19.5)	(11.0)	(10.0)	(10.3)
CASH	-3.3	-6.5	-14.0	-12.6	-2.8	-1.7
	(3.4)	(3.6)	(16.6)	(14.7)	(4.5)	(3.7)
EQUI	0.0	-0.0	-0.2^{***}	-0.2^{***}	0.0	0.0
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
DEPO	4.7	1.0	6.2	7.4^{**}	3.2	3.4
	(2.4)	(2.1)	(3.7)	(2.9)	(3.7)	(3.6)
Constant	-3.0	13.9^{***}	-3.0	13.8	5.7	3.9
	(5.8)	(3.0)	(28.2)	(16.4)	(6.2)	(5.0)
R2	0.2	0.2	0.2	0.2	0.2	0.2
N	2307	2307	569	569	421	421

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. HIC High-income; UMC Upper-middle-income; LMIC Lower-middle and Low-income. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

estimate of -0.017, also statistically significant at a 1% confidence level. The $SPND_j$ and $DEBT_j$ variables enter positively, as before, with the $SPND_j$ variable statistically insignificant, while for the small and medium-sized sub-samples the $DEBT_j$ variables are statistically significant at 5% and 1% confidence levels respectively.

Overall, then, we find that our full sample results indicating a negative relationship between growth in lending by banks in countries and high spending and government debt levels was most pronounced for the medium and smaller banks in our sample. Our results for banks split by reliance on deposit funding are shown in columns 4 and 5. Here again, there is a discrepancy in sample size, as

estimates for these variables again are qualitatively analogous to those in our base specification.[16] The other sub-samples are substantively smaller. We have 569 observations for banks from Upper-middle-income countries, with results shown in columns 3 and 4. Column 3 repeats our base specification for this sub-sample with the interactive term $SPND_j x DEBT_j$ included. This term continues to enter negatively, and indeed obtains a substantively larger point estimate than it did in either our full sample or our sub-sample of banks from high-income countries. However, it is statistically insignificant. As in our full sample, with the interactive term included the $SPND_j$ variable on its own enters insignificantly positive, while the $DEBT_j$ variable on its own continues to enter positively, but it is now insignificant as well. Column 4 reports the results for our upper-middle-income country sub-sample with the interactive term removed. Both the $SPND_j$ variable and the $DEBT_j$ variable enter insignificantly.

We have 421 observations for banks from either lower middle-income or low-income countries. Our results are shown in columns 5 and 6, with the interactive term included and excluded respectively.

[16] The results for the conditioning variables were also similar to those is our base specifications, and for space purposes are available upon request.

With the interactive term included, all variables of interest are insignificant. However, with the interactive term excluded in column 6 the results are more in keeping with those in our full sample. Both the $SPND_j$ variable and the $DEBT_j$ variable enter negatively. However, while the $SPND_j$ variable obtains coefficient point estimates qualitatively close to those in our full sample, and is statistically significant at a 1% confidence level, our $DEBT_j$ variable enters with a lower coefficient estimate and is now statistically insignificant.

Overall, our results from sub-samples by country income levels suggest that our full-sample results are primarily driven by banks from high-income countries, while the results for banks from the upper middle sample are generally weaker, as are those from the lower middle income and lower income sample.

4.3 Difference by bank size, funding strategies, and financial strength

As discussed above, there is reason to believe that the importance of implicit and explicit government guarantees under the COVID-19 pandemic may vary systematically by bank size and activity. We therefore examine the performances of sub-samples by banking size and funding strategy. We characterize large banks as those with assets exceeding $100 billion, small banks as those with assets less than $10 billion, and medium-sized banks as those with assets in between. We designate high-deposit banks as those with deposit-to-total funding ratios greater than 0.75, and low-deposit banks as those below 0.75.

Our results are shown in Table 4. We first consider sub-samples by bank size, in columns 1 through 3. Note that sample size varies substantively, with the large banks sample very small at 185 observations, the medium-sized bank sample somewhat larger, at 690 observations, and the “small”

Table 4. Results by Bank's Size and Deposit Funding.

	(1) Large	(2) Mid	(3) Small	(4) High-Deposit	(5) Low-Deposit	(6) BLHI	(7) BLLO
SPND	0.1	0.4	0.5	-0.5	0.9	0.5	0.3
	(0.4)	(0.5)	(0.4)	(0.7)	(0.5)	(0.6)	(0.4)
SPNDxDEBT	-0.6	-1.9^{**}	-1.7^{**}	-0.6	-2.1^{*}	-1.8^{*}	-1.2^{*}
	(0.5)	(0.7)	(0.6)	(0.7)	(0.9)	(0.8)	(0.6)
DEBT	7.6	28.9^{*}	23.3^{*}	9.2	29.7^{*}	26.2^{*}	16.2
	(8.0)	(11.6)	(9.9)	(9.1)	(14.3)	(12.2)	(9.6)
CV19	-0.5	-2.1^{*}	-0.7	-2.1^{*}	-0.9	-1.3	-0.7
	(0.7)	(0.8)	(0.6)	(1.0)	(0.6)	(0.7)	(0.5)
GGDP	-0.0	-0.1	0.5	-0.3	0.6	0.3	0.3
	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.3)
POPN	0.7^{***}	0.4	0.3	0.7^{***}	0.3	0.3	0.6^{***}
	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.2)
HIC	6.2^{***}	11.5^{***}	13.5^{***}	12.0^{***}	12.6^{***}	13.4^{***}	11.0^{***}
	(1.6)	(2.7)	(1.5)	(3.0)	(2.0)	(2.7)	(1.4)
UMC	0.0	4.5	1.1	-1.4	3.4	3.9	-2.4
	(.)	(2.6)	(2.2)	(2.0)	(2.8)	(3.1)	(1.4)
LGLOAN	-0.0	0.3^{**}	0.3^{***}	0.3^{***}	0.2^{***}	0.2^{***}	0.2^{***}
	(0.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)
BADL	-39.6	-13.3	-20.4^{***}	-11.8	-21.1^{**}	-18.0^{**}	26.7
	(21.0)	(17.3)	(5.7)	(6.9)	(6.5)	(6.5)	(32.8)
CASH	-1.4	-3.2	1.4	-10.0	1.9	0.2	0.2
	(4.5)	(4.9)	(3.7)	(7.3)	(4.4)	(5.8)	(3.0)
EQUI	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1^{**}	-0.0
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
DEPO	10.7^{***}	6.9	5.7^{*}	9.4^{**}	4.1	7.1^{*}	6.0^{**}
	(2.3)	(3.6)	(2.5)	(2.9)	(6.4)	(3.2)	(2.2)
Constant	-6.1	-15.4	-13.6^{*}	-4.2	-15.7	-15.3	-9.7
	(5.0)	(8.4)	(6.2)	(7.6)	(11.7)	(8.7)	(6.2)
R2	0.6	0.4	0.3	0.4	0.3	0.2	0.4
N	162	679	2456	836	2461	1595	1702

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. 'Large' refers to total assets greater than \$100B; 'Small' for less than \$10B. 'High-Deposit' refers to deposits/total funding of more than 0.75. BLHI and BLLO estimate high banks with high and low shares of bad loans respectively. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

bank sample the largest, at 2,422 observations. Note that while the number of banks in the large bank sample is relatively small, these banks as a group comprise 77 percent of our full sample total assets.

We find that the interactive term $SPND_j xDEBT_j$ enters negatively for all three sub-samples by size. The coefficient point estimate is smallest for the large bank sample, at -0.007, and it misses statistical significance at conventional confidence levels. However, the term enters statistically significantly for the medium and small bank sub-samples, with the largest point estimate for the medium-sized bank sub-sample, which enters with a point estimate of -0.024 at a statistically significant 1% confidence level, while the coefficient estimate for the small bank sub-sample enters with a point

banks designated as "high deposit" constitute 2,439 observations, while our low deposit bank sub-sample is smaller, at 858 observations.

Our results for the high deposit sample are comparable to those for our full sample. The interactive term $SPND_j xDEBT_j$ enters negatively at a 5% confidence level with a point estimate qualitatively close to that in our full sample. The $SPEND_j$ and $DEBT_j$ variables enter positively with the former insignificant, also as in our full sample. The latter variable is statistically significant at a 10% confidence level, with a point estimate comparable to our base specification results.

Our results for the low deposit sub-sample are somewhat different. We continue to obtain a negative and statistically significant coefficient estimate for our interactive variable, $SPND_j xDEBT_j$, with a modestly smaller point estimate. However, the point estimate for the $SPND_j$ variable is much smaller and statistically insignificant. As a result, our point estimates indicate that the net impact of a one standard deviation increase in the $SPND_j$ variable for low-deposit banks with our sample with a mean debt position for that group of 76.12 will experience on average a 5.45 percentage point decrease in lending growth. This figure is 70 basis points above that which we obtained for our base specification.

We also obtain a somewhat smaller positive coefficient on the $DEBT_j$ variable, although it remains statistically significant at a 5% confidence level.

Finally, we separate our sample into weaker and stronger bank sub-samples, with bank strength proxied by higher and lower shares of bad loans to total assets. We continue to obtain negative and statistically significant coefficient estimate for our interactive variable, $SPND_j xDEBT_j$, in both sub-samples. However, the point estimate on the interactive term is substantively higher for the weal bank sub-sample than for the strong bank sub-sample, -0.018 vs -0.013 respectively. This indicates that the relationship between fiscal stimulus and bank lending growth is more sensitive to national fiscal positions among weaker than stronger banks.

Overall, our results from separating the sample by bank type indicate that our full sample results are primarily driven by the smaller and high deposit banks in our sample, characteristics that typically correspond to more conventional banking firms, and are stronger for weaker banks. We view these results as supportive of the hypothesis that bank responses to fiscal spending are influenced by their perception of the probability of government assistance going forward, as weaker banks are more likely than strong ones to need such assistance, holding all else equal.

6. Robustness checks

6a. Changes in specification

Finally, we subject our results to a battery of robustness tests. First, Table 5a examines some changes in our base specification. Columns 1 and 2 substitute the bank capital ratio and the leverage ratio for our equity ratio variable respectively. Our results are qualitatively robust to these specification

Table 5a. Robustness checks: perturbations in specification.

	(1) 1	(2) 2	(3) 3	(4) 4
SPND	1.0	0.8	0.5	0.2
	(0.6)	(0.5)	(0.5)	(0.5)
SPNDxDEBT	-2.0*	-2.1**	-1.3	-1.0
	(0.9)	(0.8)	(0.7)	(0.6)
DEBT	28.4*	29.4*	17.8	12.7
	(14.4)	(12.0)	(11.6)	(8.4)
CV19	-0.5	-1.0	-1.0	
	(0.7)	(0.6)	(0.5)	
GGDP	0.5	0.4	0.4	
	(0.3)	(0.3)	(0.3)	
POPN	0.4	0.4	0.5*	
	(0.3)	(0.3)	(0.3)	
HIC	11.2***	12.5***	12.0***	9.6***
	(2.1)	(1.7)	(1.6)	(1.8)
UMC	2.7	2.3	0.6	1.2
	(3.2)	(2.5)	(2.3)	(2.2)
LGLOAN	0.2***	0.3***		0.2***
	(0.0)	(0.0)		(0.0)
BADL	-19.4**	-20.9***		-25.3***
	(6.8)	(6.0)		(6.5)
CASH	3.9	1.5		-3.0
	(5.4)	(4.4)		(3.6)
DEPO	9.4**	7.7**		6.6**
	(3.2)	(2.6)		(2.4)
CAPR	-0.0			
	(0.0)			
LEVR		0.1*		
		(0.0)		
EQUI				-0.1*
				(0.1)
Constant	-22.3*	-20.2*	-7.0	-7.6
	(9.8)	(8.4)	(6.1)	(7.2)
R2	0.3	0.3	0.3	0.3
N	2731	3297	3297	3297

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

changes, with coefficient estimates of the same order of magnitude and entering at similar levels of statistical significance as those in our base specification.

Column 3 drops all our bank conditioning variables. It can be seen that our qualitative results are robust to the exclusion of these variables, although the coefficient estimates on the $SPEND_j xDEBT_j$ variables are only significant at a 10% confidence level, while those on the variables individually become insignificant. In Appendix Table A5, we drop the bank conditioning variables one at a time, and show that our qualitative results are quite robust to the exclusion of any individual bank conditioning variable in our specification, as our point estimates and estimated statistical significance are similar to those in our base specification.

Column 4 similarly drops all our country conditioning variables. Our results are again qualitatively similar to those in our base, with our variables of interest retaining their sign estimates and entering with similar point estimates. However, we again see that the significance of our variables of interest are reduced, with our interactive term entering statistically significant at a 10% confidence level. We also dropped the individual country conditioning variables one at a time.

6b. Changes in estimation

Table 5b lists a number of changes in our estimation methodology for our base specification. We report results using ordinary least squares estimation (Column 1), White's heteroscedasticity robust standard errors instead of clustering (Column 2), conventional standard errors instead of clustering

(Column 3), clustering by income groups instead of individual countries (column 4), and by trimming the observations at the 99% level instead of winsorizing.

Table 5b. Robustness checks: changes in estimation method.

	(1) OLS	(2) IV-WHITE	(3) IV-STD	(4) IV-CL-INC	(5) TRIM
SPND	0.2	0.7***	0.7***	0.7***	0.7
	(0.2)	(0.2)	(0.2)	(0.1)	(0.5)
SPNDxDEBT	-0.8***	-1.9***	-1.9***	-1.9***	-1.9**
	(0.2)	(0.3)	(0.2)	(0.3)	(0.7)
DEBT	10.3**	27.5***	27.5***	27.5***	27.5*
	(3.0)	(4.3)	(3.3)	(4.1)	(11.2)
CV19	-0.6	-1.0***	-1.0***	-1.0***	-1.0
	(0.5)	(0.2)	(0.2)	(0.3)	(0.5)
GGDP	0.2	0.4***	0.4***	0.4***	0.4
	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)
POPN	0.6***	0.4***	0.4***	0.4**	0.4
	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)
HIC	11.1***	12.6***	12.6***	12.6***	12.6***
	(1.6)	(0.7)	(0.6)	(0.8)	(1.6)
UMC	-0.1	2.1*	2.1***	2.1	2.1
	(1.3)	(0.9)	(0.6)	(1.2)	(2.3)
LGLOAN	0.2***	0.3***	0.3***	0.3***	0.3***
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
BADL	-15.7**	-20.6***	-20.6***	-20.6***	-20.6***
	(5.8)	(3.8)	(2.5)	(3.2)	(6.2)
CASH	-3.0	0.8	0.8	0.8	0.8
	(2.7)	(1.9)	(1.5)	(3.6)	(4.0)
EQUI	-0.1	-0.1*	-0.1***	-0.1	-0.1
	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)
DEPO	5.0*	7.3***	7.3***	7.3***	7.3**
	(1.9)	(1.1)	(0.8)	(1.7)	(2.4)
Constant	-6.3*	-16.7***	-16.7***	-16.7***	-16.7*
	(2.8)	(3.0)	(2.3)	(2.5)	(7.5)
R2	0.4	0.3	0.3	0.3	0.3
N	3297	3297	3297	3297	3297

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. Column (1) estimated with ordinary least squares. Column (2), IV-WHITE, IV estimation with White standard errors. Column (3), IV-STD, IV with conventional standard errors. Column (4), IV-CL-INC, refers to IV with standard errors clustered by income group. TRIM refers to a sample with all variables trimmed at the 1st and 99th percentiles rather than winsorized. Endogenous variables under 2SLS IV estimation include COVID-19 fiscal spending and its interaction with public debt/GDP, SPND and SPNDxDEBT. See text for definitions of political-economy instruments; POLR, GVEF, PRES, and DURA. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Our baseline results are robust to all of these perturbations. In particular, the interactive term continues to enter negatively with similar point estimates to those in our baseline specification at statistically significant levels.

6c. Dropping outliers

To ensure that our results are not driven by outliers, we examine our base specification results for samples with outlier values for a variety of variables omitted, with outliers identified as values lying three standard deviations above or below our sample means as indicated.

Our results are shown in Table 5c. We drop banks with exceptionally high lending growth (Column 1), very low lending growth (Column 2), exceptionally high shares of problem loans (Column 3), exceptionally high cash holdings (Column 4), and those with very high equity holdings (Column 5). In all cases, our results are qualitatively similar to those we obtain with our base specification and sample. In particular, the interactive term of interest, $SPND_j xDEBT_j$ enters significantly negatively throughout with similar point estimates to those in our base regression.[17]

7. Conclusion

This study investigates the implications of extra-normal government spending under the COVID-19 pandemic for commercial bank lending growth. We address the likely endogeneity of government

[17] As discussed above, we found that Japanese banks were influential due to the large debt/GDP levels prevailing in Japan. We therefore check the influence that Japanese banks have on our results (Appendix Table A6). Overall, the results are similar to our base sample, with the primary difference being the reduced coefficient estimate and statistical insignificance of the interaction between public debt and COVID-19 fiscal spending (SPNDj xDEBTj). Most of the other variables enter with similar signs and comparable significance levels, including the weighted least squares specification in which the interactive term enters significantly again with its predicted negative sign.

Table 5c. Robustness checks: outlier banks dropped.

	(1)	(2)	(3)	(4)	(5)
	HI-GLOAN	LO-GLOAN	HI-BADL	HI-CASH	HI-EQUI
SPND	0.6	0.8	0.8	0.7	0.7
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
SPNDxDEBT	-1.6*	-1.9**	-2.2**	-2.0**	-1.9*
	(0.7)	(0.7)	(0.8)	(0.7)	(0.8)
DEBT	22.9*	27.2*	31.4*	27.8*	27.5*
	(10.9)	(11.0)	(12.5)	(11.0)	(11.9)
CV19	-0.8	-0.9	-1.2*	-0.9	-1.0
	(0.5)	(0.5)	(0.6)	(0.5)	(0.5)
GGDP	0.3	0.4	0.4	0.4	0.4
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
POPN	0.5	0.3	0.3	0.4	0.4
	(0.2)	(0.2)	(0.3)	(0.2)	(0.3)
HIC	11.7***	12.0***	12.6***	12.8***	12.7***
	(1.5)	(1.7)	(1.7)	(1.6)	(1.7)
UMC	1.4	2.5	2.3	2.6	2.6
	(2.2)	(2.2)	(2.5)	(2.4)	(2.4)
LGLOAN	0.2***	0.3***	0.3***	0.2***	0.3***
	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
BADL	-19.1**	-17.7**	-28.5**	-20.4**	-21.7**
	(5.8)	(6.1)	(9.4)	(6.3)	(6.6)
CASH	-0.8	1.2	1.5	1.5	0.3
	(3.8)	(4.1)	(4.5)	(5.2)	(4.3)
EQUI	-0.1**	-0.1	-0.1	-0.1	-0.1*
	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)
DEPO	6.2**	6.1**	8.1**	7.4**	8.0**
	(2.3)	(2.2)	(2.7)	(2.5)	(2.8)
Constant	-13.5	-15.9*	-18.5*	-17.3*	-17.0*
	(7.2)	(7.3)	(8.1)	(7.6)	(7.9)
R2	0.3	0.3	0.3	0.3	0.3
N	3261	3259	3213	3213	3218

Note: Dependent variable: GLOAN. Standard errors, clustered by country, are in parentheses. HI-GLOAN refers to a sample without banks with lending growth (GLOAN) higher than the 99th percentile; similarly defined for HI-BADL, HI-CASH, and HI-EQUI. LO-GLOAN refers to a sample without banks with lending growth lower than the 1st percentile. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

assistance under the pandemic by instrumenting for extra-normal spending using disparities in pre-existing national political characteristics for identification.

Our results indicate that higher public debt going into the crisis weakened the expansionary effects of higher spending on bank lending at economically and statistically significant levels. This suggests that the fiscal multiplier for credit extension, as represented by bank lending growth, was larger for countries that entered the pandemic in superior fiscal positions. Moreover, this sensitivity was higher among weaker banks, suggesting that bank lending responses to government spending under COVID-19 reflected the perceived implications of such spending for government assistance of the banking sector going forward.

The crisis itself only exacerbated fiscal challenges faced by countries, as governments felt compelled to extend sizable transfers to adversely affected households and businesses. This may portend continued difficulties after the global pandemic subsides, as nations' expanded fiscal burden may continue to constrain lending growth going forward.

In turn, as governments normalize policy in the wake of recovery from the pandemic, tightened financial conditions may amplify lending crunches and increase sharply the flow costs of serving debt overhangs in exposed countries.[18]

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[18] *The Economist* (February, 2022) projects increased interest rates faced by firms, households and governments by a percentage point over the next three years. Under the assumption that this increase feeds through in five years to government and household debt, and over two years to company borrowing, and that nominal incomes rise in line with the IMF's forecasts while debt-to-GDP ratios stay flat, they project that the interest bill will reach 15% of projected GDP in 2026. If rates were to rise twice as quickly, say because inflation of more rapid tightening in response to inflation pressures, the interest bill could rise to about a fifth of GDP.

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Appendix

Table A1. Data sources and descriptions

Data	Description	Date Accessed
Bank Lending Growth; lag (GLOAN; LGLOAN) Bank-Level Controls (BADL: Bad Loans Ratios; CASH: Cash to Total Assets; EQUI: Equity to Total Assets; DEPO: Deposit to Total Assets; LEVR: Leverage Ratios; CAPR: Capital Ratios; SIZE: Total Assets)	Bank-level data are from FitchSolutions. US banks are not in the sample. The variables are drawn from the quarterly reports.	2021-11-11
COVID-19 above-the-line fiscal spending (SPND: COVID-19 Fiscal Spending; LIQS: COVID-19 Liquidity Supports)	Data on pandemic policy supports are from Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic.	2021-11-16
Public Debt and Macro Controls (DEBT: Public Debt/GDP; GGDP: GDP Growth; POPN: Population)	Macroeconomic pre-conditions are drawn from national authorities and international organizations via Thomson Reuters Eikon.	2021-12-11
COVID-19 Excess Deaths (CV19)	COVID-19 estimates of excess deaths (per million population) are from the Economist's Global Excess Deaths model.	2021-09-12
Institutional Variables (POLR: Political Rights; DURA: Regime Durability; GVEF: Government Effectiveness; PRES: Presidential System)	Government Effectiveness (PRS19GE): an index from International Country Risk Guide (2019). The index goes from 0 to 1; higher value	2020-12-14

	corresponds to higher government effectiveness. Regime Durability: number of years since the most recent regime change as of 2018, from the Quality of Government Basic Dataset. Political Rights: an index from Freedom House; re-scaled to (0,1), the higher value the higher degree of political freedom. Presidential System: 1 if presidential system and 0 otherwise, from the Database of Political Institutions.	
Country Classification	The latest classification of income and geographic regions is from World Bank, and also IMF's classification to identify emerging market and middle-income economies not classified as advanced economies or low-income developing countries, together with the list of Euro membership. The bank-level and country-level observations are combined using 2-digit (Eikon) and 3-digit (FitchSolutions) country letter codes in the respective datasets.	2022-01-17

Table A2. Countries, Bank Lending Growth, and Numbers of Banks.

	Mean	Standard deviation	Frequency
Country Name			
ANGOLA	-.3936534	9.290697	4
ARGENTINA	-10.46485	8.049706	11
ARMENIA	2.772249	5.752794	14
AUSTRALIA	7.378775	14.93947	7
AUSTRIA	7.697911	2.332107	15
AZERBAIJAN	-3.137809	8.971643	12
BANGLADESH	4.08094	5.477196	44
BELARUS	-2.773004	8.576385	20
BELGIUM	4.890028	5.481459	12
BRAZIL	-2.49153	11.25935	91
CANADA	4.201277	6.888722	52
CHILE	.2429554	7.08765	14
CHINA	11.09144	5.459312	136
COLOMBIA	1.198453	8.366584	34
CZECH REPUBLIC	7.406158	10.29503	18
DENMARK	3.320947	3.083934	25
DOMINICAN REPUBLIC	-1.06215	9.969654	35
EGYPT	6.24083	4.759595	21
ESTONIA	15.76603	12.46978	8
FINLAND	8.758173	6.221393	10
FRANCE	11.83452	7.62264	134
GERMANY	9.006659	3.583502	735
GHANA	2.362549	9.980984	15
GREECE	5.133044	6.728921	6
HUNGARY	6.389607	.7639742	8
INDONESIA	-1.872382	9.364711	89
IRELAND	2.331326	3.760049	11
ISRAEL	8.997868	5.781368	8
ITALY	8.267946	6.282174	211
JAPAN	2.697825	3.487492	398
JORDAN	3.350864	5.229394	12
KAZAKHSTAN	-4.153718	9.633135	14
KENYA	.4341425	5.989796	34
KOREA (SOUTH), REPUBLIC OF	13.97867	9.13609	96
KUWAIT	-.1757287	2.571886	5
LATVIA	3.388634	5.852212	7
LITHUANIA	4.736902	3.726434	4
LUXEMBOURG	7.170396	4.715736	3
MALAYSIA	-.1142207	6.758919	22
MEXICO	-4.224548	8.191903	61
MOLDOVA, REPUBLIC OF	4.716295	8.419125	9
MOROCCO	8.266481	8.725383	9
MOZAMBIQUE	-3.716218	7.548597	9
NETHERLANDS	4.37421	5.64296	10

NEW ZEALAND	9.636285	8.95596	5
NIGERIA	-1.172624	8.541499	19
NORWAY	4.137159	6.66876	37
PAKISTAN	.102639	10.34309	29
PERU	-.8236039	10.5718	14
PHILIPPINES	-.3245118	6.867227	31
POLAND	.4941578	5.816453	13
PORTUGAL	5.51794	5.419299	14
ROMANIA	10.7938	6.120651	18
RUSSIAN FEDERATION	-7.380609	7.145761	46
SAUDI ARABIA	3.586703	5.691111	7
SINGAPORE	1.345438	4.80082	8
SLOVAKIA	8.263117	6.847744	10
SLOVENIA	9.103508	9.515633	12
SOUTH AFRICA	-.6559664	2.878194	10
SPAIN	7.849073	5.21747	42
SRI LANKA	2.31878	7.28286	17
SWEDEN	14.00908	6.072209	70
SWITZERLAND	10.90178	3.659598	196
THAILAND	2.539306	8.159744	21
TURKEY	-1.497363	7.991708	24
UGANDA	4.161587	7.54581	9
UKRAINE	-5.425294	11.44177	27
UNITED ARAB EMIRATES	-2.249336	8.378167	21
UNITED KINGDOM	3.963256	5.692852	75
VIETNAM	8.937131	6.009928	22
ZAMBIA	-5.897465	4.43368	7
Total	5.691272	8.114546	3,297

Table A3. Detailed Summary Statistics.

Whole Sample	Mean	SD
GLOAN	5.691	8.115
LGLOAN	3.72	7.003
BADL	.043	.056
CASH	.082	.099
EQUI	10.504	6.136
DEPO	.817	.183
LEVR	11.524	7.168
SPND	10.238	5.408
SPNDxDEBT	10.284	11.686
DEBT	.836	.627
LIQS	15.024	12.463
CV19	1.088	1.01
GGDP	-4.273	3.15
POPN	1.348	2.758
POLR	5.905	1.894
DURA	53.048	41.279
GVEF	.8	.226
PRES	.283	.451

High-income Economies	Mean	SD
GLOAN	7.69	6.341
LGLOAN	2.588	5.672
BADL	.034	.045
CASH	.066	.09
EQUI	8.928	4.305
DEPO	.836	.167
LEVR	12.947	7.437
SPND	12.627	4.306
SPNDxDEBT	13.655	12.465
DEBT	.969	.694
LIQS	20.578	10.803
CV19	.958	.896
GGDP	-4.987	2.419
POPN	.663	.395
POLR	6.85	.738
DURA	63.689	43.168
GVEF	.919	.138
PRES	.147	.354

Upper-middle-income Economies	Mean	SD
GLOAN	1.077	10.435
LGLOAN	6.436	9.02
BADL	.056	.066
CASH	.11	.1
EQUI	14.016	8.046
DEPO	.72	.23
LEVR	8.34	5.152
SPND	5.25	3.162
SPNDxDEBT	2.996	2.569
DEBT	.529	.213
LIQS	3.212	2.628
CV19	1.647	1.309
GGDP	-3.287	4.015
POPN	4.172	5.738
POLR	3.417	2.169
DURA	35.228	22.461
GVEF	.524	.13
PRES	.594	.492

Lower-middle and Low-income Economies	Mean	SD
GLOAN	.977	8.698
LGLOAN	6.252	8.648
BADL	.074	.078
CASH	.131	.115
EQUI	14.399	7.781
DEPO	.847	.151
LEVR	8.034	5.161
SPND	3.888	2.956
SPNDxDEBT	1.664	.911
DEBT	.519	.229
LIQS	.553	.695
CV19	1.049	.87
GGDP	-1.692	3.625
POPN	1.287	.955
POLR	4.09	1.477
DURA	18.822	15.215
GVEF	.525	.139
PRES	.61	.488

Banks with total assets larger than $100B	Mean	SD
GLOAN	4.699	5.471
LGLOAN	3.21	4.426
BADL	.026	.025
CASH	.11	.095
EQUI	6.895	2.315
DEPO	.673	.182
LEVR	15.134	5.516
SPND	10.393	5.392
SPNDxDEBT	11.566	12.01
DEBT	.917	.613
LIQS	11.069	10.016
CV19	.966	1.006
GGDP	-4.166	4.134
POPN	2.84	5.066
POLR	5.444	2.401
DURA	72.556	39.307
GVEF	.81	.205
PRES	.191	.395

Banks with total assets lower than $100B	Mean	SD
GLOAN	5.743	8.225
LGLOAN	3.746	7.111
BADL	.044	.057
CASH	.08	.099
EQUI	10.691	6.214
DEPO	.825	.18
LEVR	11.338	7.195
SPND	10.23	5.41
SPNDxDEBT	10.218	11.667
DEBT	.832	.627
LIQS	15.229	12.544
CV19	1.095	1.01
GGDP	-4.279	3.091
POPN	1.271	2.561
POLR	5.929	1.861
DURA	52.04	41.133
GVEF	.8	.228
PRES	.288	.453

Banks with deposits/total funding more than 0.75	Mean	SD
GLOAN	6.007	7.61
LGLOAN	3.638	6.871
BADL	.041	.054
CASH	.084	.101
EQUI	10.348	5.849
DEPO	.901	.074
LEVR	11.632	7.291
SPND	10.804	5.487
SPNDxDEBT	11.321	12.76
DEBT	.867	.682
LIQS	16.068	12.387
CV19	.955	.949
GGDP	-4.088	2.873
POPN	1.14	2.183
POLR	6.024	1.783
DURA	51.276	41.127
GVEF	.83	.223
PRES	.273	.445

Banks with deposits/total funding less than 0.75	Mean	SD
GLOAN	4.761	9.389
LGLOAN	3.961	7.379
BADL	.049	.061
CASH	.074	.092
EQUI	10.966	6.894
DEPO	.571	.186
LEVR	11.209	6.788
SPND	8.572	4.799
SPNDxDEBT	7.231	6.845
DEBT	.744	.409
LIQS	11.952	12.181
CV19	1.481	1.08
GGDP	-4.819	3.801
POPN	1.963	3.934
POLR	5.555	2.15
DURA	58.264	41.309
GVEF	.714	.213
PRES	.315	.465

Table A4. First-stage estimation.

	(1) GLOAN	(2) SPND	(3) SPNDxDEBT	(4) GLOAN
SPND	0.7			
	(0.5)			
SPNDxDEBT	-1.9**			
	(0.7)			
LGLOAN	0.3***	0.0**	0.1***	0.2***
	(0.0)	(0.0)	(0.0)	(0.0)
BADL	-20.6***	-0.6	-2.6	-16.2**
	(6.2)	(4.0)	(2.9)	(6.2)
CASH	0.8	0.0	4.0*	-6.8**
	(4.0)	(2.2)	(1.7)	(2.6)
EQUI	-0.1	-0.0	0.0	-0.1
	(0.0)	(0.0)	(0.0)	(0.0)
DEPO	7.3**	0.4	2.2**	3.8
	(2.4)	(1.2)	(0.8)	(2.0)
GGDP	0.4	-0.4	-0.0	0.2
	(0.3)	(0.2)	(0.1)	(0.2)
CV19	-1.0	-0.4	-0.4	-0.7
	(0.5)	(0.6)	(0.4)	(0.5)
POPN	0.4	0.3	-0.1	0.6**
	(0.2)	(0.2)	(0.2)	(0.2)
DEBT	27.5*	1.7**	16.6***	-3.7***
	(11.2)	(0.7)	(0.6)	(0.7)
HIC	12.6***	0.6	0.2	11.6***
	(1.6)	(1.9)	(1.7)	(2.5)
UMC	2.1	0.8	2.0	-0.6
	(2.3)	(1.6)	(1.6)	(1.8)
POLR		0.4	-0.2	0.7
		(0.3)	(0.3)	(0.5)
GVEF		13.5***	11.5***	-14.3***
		(3.4)	(2.4)	(3.6)
PRES		-1.8	-1.1	-0.9
		(1.2)	(0.9)	(1.4)
DURA		-0.0	-0.0	0.0
		(0.0)	(0.0)	(0.0)
Constant	-16.7*	-5.4	-13.7***	7.4*
	(7.5)	(3.1)	(2.3)	(3.5)
N	3297	3297	3297	3297
F-statistics	25.3	7.14	8.80	28.57
Underidentification	7.0			
Weak identification	3.3			

Note: Standard errors, clustered by country, are in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A5. Bank and country conditioning variables dropped one at a time.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SPND	0.7	0.5	0.7	0.7	0.7	1.1	0.4	0.9
	(0.5)	(0.4)	(0.4)	(0.5)	(0.5)	(0.6)	(0.3)	(0.4)
SPNDxDEBT	-1.8*	-1.6*	-1.9**	-1.9*	-1.9*	-2.6**	-1.5**	-1.9**
	(0.7)	(0.7)	(0.7)	(0.7)	(0.8)	(0.8)	(0.5)	(0.7)
DEBT	24.1*	23.0*	27.6*	26.6*	27.6*	37.6**	20.9**	27.8*
	(11.4)	(10.6)	(11.2)	(11.5)	(12.0)	(12.9)	(7.9)	(11.4)
CV19	-1.1*	-0.9	-1.0	-0.9	-1.1	-1.1	-1.3*	
	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)	(0.7)	(0.5)	
GGDP	0.4	0.3	0.4	0.4	0.5	0.7*		0.6*
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)		(0.3)
POPN	0.5	0.4	0.4	0.4	0.3		0.6***	0.4
	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)		(0.1)	(0.2)
HIC	12.6***	11.6***	12.6***	12.9***	12.4***	12.7***	11.8***	11.9***
	(1.6)	(1.5)	(1.6)	(1.6)	(1.8)	(2.0)	(1.8)	(1.9)
UMC	2.0	1.6	2.1	1.9	1.6	4.0	1.0	1.6
	(2.3)	(2.2)	(2.4)	(2.3)	(2.6)	(2.1)	(1.8)	(2.4)
LGLOAN	0.3***		0.3***	0.3***	0.3***	0.3***	0.2***	0.2***
	(0.0)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
CASH	0.1	-0.8		0.2	2.3	3.3	-0.8	1.5
	(4.2)	(3.7)		(4.0)	(4.7)	(5.0)	(3.5)	(4.2)
EQUI	-0.1*	-0.1	-0.1		-0.1	-0.1	-0.1*	-0.1
	(0.1)	(0.0)	(0.0)		(0.1)	(0.1)	(0.0)	(0.0)
DEPO	6.7**	6.8**	7.4**	7.2**		8.4**	7.1**	7.5**
	(2.4)	(2.3)	(2.6)	(2.4)		(3.0)	(2.3)	(2.5)
BADL		-25.6***	-20.6***	-21.8***	-19.9**	-23.5***	-18.8**	-22.0***
		(6.2)	(6.2)	(6.1)	(6.1)	(6.1)	(5.9)	(5.8)
Constant	-16.0*	-11.6	-16.7*	-17.4*	-10.6	-22.5*	-13.0*	-18.6*
	(7.9)	(6.9)	(7.2)	(7.7)	(6.6)	(10.0)	(5.9)	(7.6)
R2	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3
N	3297	3297	3297	3297	3297	3297	3297	3297

Note: Bank conditioning variables dropped one at a time in columns (1) through (5). Country conditioning variables dropped in columns (6) through (8). Standard errors, clustered by country, are in parentheses. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A6. Robustness checks: excluding Japanese banks.

	(1)	(2)	(3)	(4)
SPND	-0.2	-0.4*		0.1
	(0.6)	(0.2)		(0.1)
SPNDxDEBT	-0.5		-0.8*	-0.8***
	(1.0)		(0.3)	(0.1)
DEBT	8.8	4.3**	11.2***	11.9***
	(8.7)	(1.5)	(3.2)	(1.3)
CV19	-1.0	-1.1*	-0.9	-1.0***
	(0.6)	(0.5)	(0.5)	(0.1)
GGDP	0.2	0.2	0.2	0.1
	(0.2)	(0.2)	(0.2)	(0.0)
POPN	0.6***	0.6***	0.6***	0.5***
	(0.1)	(0.1)	(0.1)	(0.0)
HIC	11.6***	11.1***	11.8***	8.7***
	(1.8)	(1.6)	(1.8)	(0.5)
UMC	0.3	0.1	0.4	1.3*
	(1.2)	(1.2)	(1.2)	(0.5)
LGLOAN	0.2***	0.2***	0.2***	0.2***
	(0.0)	(0.0)	(0.0)	(0.0)
BADL	-19.3**	-20.9***	-18.2**	-10.9***
	(6.4)	(5.7)	(6.0)	(3.2)
CASH	-3.9	-4.3	-3.6	-0.6
	(3.2)	(2.8)	(2.9)	(1.3)
EQUI	-0.1	-0.1	-0.1	-0.1**
	(0.0)	(0.0)	(0.0)	(0.0)
DEPO	5.6**	5.5**	5.7**	9.0***
	(1.8)	(1.9)	(1.9)	(0.5)
Constant	-4.6	-1.7	-6.3*	-10.3***
	(6.2)	(2.3)	(2.6)	(1.3)
R2	0.4	0.4	0.4	0.6
N	2899	2899	2899	2899

Note: Standard errors, clustered by country, are in parentheses. Each column shows the estimates based on the single-equation instrumental-variables regression. The endogenous variables are COVID-19 fiscal spending and its interaction with public debt/GDP; SPND and SPNDxDEBT, and the instruments are political-economy variables; POLR, GVEF, PRES, and DURA; using the 2SLS estimator. Column (4) is done with the weighted least squares, with observations weighted by bank total assets. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$