

# Banking Sector Performance During the COVID-19 Crisis

*Asli Demirguc-Kunt*

*Alvaro Pedraza*

*Claudia Ruiz-Ortega*



**WORLD BANK GROUP**

Europe and Central Asia Region

Office of the Chief Economist

&

Development Economics

Development Research Group

August 2020

## Abstract

This paper analyzes bank stock prices around the world to assess the impact of the COVID-19 pandemic on the banking sector. Using a global database of policy responses during the crisis, the paper also examines the role of financial sector policy announcements on the performance of bank stocks. Overall, the results suggest that the crisis and the countercyclical lending role that banks are expected to play have put banking systems under significant stress, with bank stocks underperforming their domestic markets and other non-bank financial firms. The effectiveness of

policy interventions has been mixed. Measures of liquidity support, borrower assistance, and monetary easing moderated the adverse impact of the crisis, but this is not true for all banks or in all circumstances. For example, borrower assistance and prudential measures exacerbated the stress for banks that are already undercapitalized and/or operate in countries with little fiscal space. These vulnerabilities will need to be carefully monitored as the pandemic continues to take a toll on the world's economies.

---

This paper is a product of the Office of the Chief Economist, Europe and Central Asia Region and the Development Research Group, Development Economics. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The authors may be contacted at [ademirguckunt@worldbank.org](mailto:ademirguckunt@worldbank.org), [apedrazamorales@worldbank.org](mailto:apedrazamorales@worldbank.org), and [cruizortega@worldbank.org](mailto:cruizortega@worldbank.org).

*The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.*

# Banking Sector Performance During the COVID-19 Crisis

Asli Demirguc-Kunt\*   Alvaro Pedraza†   Claudia Ruiz-Ortega‡

JEL classification: G01, G14, G21, G28, E58

Keywords: Bank stock returns, government announcements, liquidity premium, COVID-19

pandemic

---

\* [ademirguckunt@worldbank.org](mailto:ademirguckunt@worldbank.org), World Bank

† [apedrazamoraes@worldbank.org](mailto:apedrazamoraes@worldbank.org), World Bank

‡ [cruizortega@worldbank.org](mailto:cruizortega@worldbank.org), World Bank

## 1. Introduction

To reduce the spread of the novel COVID-19, governments enacted mitigation strategies based on social distancing, national quarantines, and shutdown of non-essential businesses. The halt to the economy represented a large shock to the corporate sector, which had to scramble for cash to cover operating costs as a result of the revenue shortfall. The financial sector, and banks in particular, are expected to play a key role absorbing the shock, by supplying much needed funding (Acharya & Steffen, 2020; Borio, 2020).<sup>4</sup> Under these unprecedented circumstances, central banks and governments enacted a wide range of policy interventions. While some measures were aimed to reduce the sharp tightening of financial conditions in the short term, others sought to support the flow of credit to firms, either by direct intervention of credit markets (e.g., government-sponsored credit lines and liability guarantees), or by relaxing banks' constraints on the use of capital buffers.

While credit institutions are being called to play an important countercyclical role to support the real sector, these actions also have a series of implications for the future resilience of the banking sector. For instance, as lenders exhaust their existing buffers, they might also experience deterioration of asset quality, threatening the systems' stability. As the crisis is expected to continue, even after the lockdowns are lifted and economies start to reopen, the net effect of these policy measures on the banking sector is largely unknown.

The contribution of this paper is twofold. First, we use bank stock prices around the world to assess the impact of the pandemic on the banking sector. Second, we combine bank stock prices with a global database on financial sector policy responses during the pandemic. Using an event

---

<sup>4</sup> Using U.S. data, Acharya & Steffen (2020) provide evidence of the transmission mechanism, whereby firms convert committed credit lines from banks into cash, exerting significant pressure on lenders.

study methodology, we examine the role of different policy initiatives on addressing the stress to banks. To better understand the impact of the measures implemented by monetary and supervisory authorities, we exploit the cross-sectional variation in the stock price of banks. In other words, we are interested in both the aggregate response of bank stocks to a particular announcement, as well as the differential effect across banks with different characteristics, such as size, liquidity, ownership and others.

We use bank data including stock prices, balance sheets, and ownership, for 53 countries covering 896 commercial banks. We first document a systematic underperformance of bank stocks at the onset of the COVID-19 crisis, between March and April of 2020. More precisely, for most countries, bank stocks underperform relative to other publicly traded companies in their home country, and relative to non-financial institutions. The evidence highlights the nature of the COVID-19 shock, and the expectations of market participants that banks will experience deeper and more protracted profit losses than other firms. Even within the financial sector, banks are expected to face greater losses than other financial institutions.

The initial phase of the crisis was characterized by liquidity shortages, exacerbated by volatility in securities and foreign exchange markets. We show that banks with lower liquidity buffers experienced larger than normal price drops (particularly in March), revealing an increase in the interbank liquidity premium. In addition, the dual shock resulting from the Russia and Saudi Arabia price war further exacerbated bank stock price declines, particularly for lenders with large exposure to the oil sector.

To study the stock market reaction to different policy measures, we identify financial sector initiatives by government authorities from February 2 to April 17. The data was compiled and made publicly available by the World Bank (World Bank, 2020). Our final sample contains 389

financial sector policy announcements in 45 countries (17 developed and 28 developing). We classify approved measures that target the banking sector into four categories. *Liquidity support* are measures used by monetary authorities to expand bank short-term funding in domestic and foreign currency. *Prudential measures* deal with the temporary relaxation of regulatory and supervisory requirements, including capital buffers. *Borrower assistance* include government-sponsored credit lines or liability guarantees to promote the flow of credit to households and firms. Finally, *monetary policy* includes policy rate cuts and quantitative easing (i.e., asset purchases). Our empirical methodology consists of estimating banks' abnormal returns around the announcement day. Our results can be summarized as follows:

- Borrower assistance announcements appeared to have the strongest immediate impact on bank stock prices, both on aggregate and in the cross-section. Banks experienced large abnormal returns following the announcement of these policies. Additionally, borrower assistance measures reduced the liquidity risk premium –banks with lower liquidity provisions experienced larger abnormal returns after announcements. Furthermore, larger banks seem to benefit more compared to smaller banks. This is consistent with the observation that new government credit lines, interest rate subsidies, and liability guarantees are more likely to be used by large banks.<sup>5</sup> Borrower assistance initiatives, which typically include the introduction of government guarantees, automatically transfer risks from banks' balance sheets to the sovereign. In turn, these policies require significant fiscal commitments. Relatedly, we find that the positive association between excess stock returns and borrower assistance measures is exclusive to developed countries. In developing countries, where there

---

<sup>5</sup> Using detailed loan-level data Ornelas et al. (2019) find that larger banks disproportionately allocated government-sponsored credit during the GFC.

is less room for fiscal expansion, announcements of borrower support had no effect on stock prices (if anything the relationship is negative). The market response seems to suggest that the extent of borrower assistance measures is limited in such settings.

- Liquidity support initiatives seem to have a favorable impact in the reduction of the liquidity risk premium. Also, smaller banks and public banks experienced large abnormal returns when liquidity support measures were announced. It appears that during the crisis, access to central bank refinancing and initiatives that address shortages in bank funding had a calming effect on markets, as evidenced by bank stocks overperformance around these events.
- In contrast, countercyclical prudential measures are associated with negative abnormal returns in bank stocks. Prudential policies allow banks to run down some of their buffers. They also send a strong signal of the willingness of policymakers to lessen the economic impact from the pandemic. However, the fact that bank stock prices drop following the announcements of these policies suggests that markets are also pricing the downside risk from the depletion of capital buffers, as well as the additional expansion of riskier loans in the balance sheets of banks.
- Finally, results for monetary policy announcements are more mixed. While such announcements were not associated with aggregate bank stock price increases, both policy rate cuts and asset purchases did seem to reduce the liquidity premium. That is, banks with lower liquidity displayed higher stock returns around the announcement window. The result confirms that the interest rate policy remained a key tool at the onset of the crisis, as well as quantitative easing, as markets have become more familiar with these measures since the global financial crisis of 2008 (GFC).

Although our event study methodology offers a straightforward strategy to evaluate the immediate market response to policy announcements, it has some limitations. First, there might be international spillovers from policy announcements by systemically important countries (Ait-Sahalia et al., 2012; Morais et al., 2019). Also, in several cases, authorities announced financial sector measures of different categories during the same day. To avoid contaminating the analysis from the effects of policy initiatives taken by core countries, we exclude data from days when the U.S. or European authorities made major announcements covering the same broad policy type category. We further condition our sample to country-dates where only policies of a particular category were announced. Importantly, almost half of our sample covers days with non-overlapping policy measures.

Second, while limiting the size of the event window helps to avoid contaminating the analysis of a given announcement's effect with other news, if the event window is too narrow, there might not be enough time for market participants to internalize the implications of particular measure. We use a five-day window, evaluating the change in stock prices from one day before the announcement to three days after, and report accumulated abnormal returns for every day during this period. Our objective is to provide a comprehensive review of the reaction of bank stock prices around announcement days and highlight findings that are robust to different specifications.

Finally, while the nature of the shock and the speed at which policymakers undertook policy actions might imply that many announcements were unexpected, it is still possible that some measures were more anticipated than others. In such cases, policy measures might be priced in before the announcement, reducing the significance of the effects. To account for such possibility,



we evaluate the robustness of our results using days in countries with emergency meetings by the monetary authority or when the interest rate cut was larger than the anticipated by market analysts.<sup>6</sup>

Our paper is related to a growing literature that studies the economic impact of the pandemic using stock market data (e.g., Gormsen & Kojien, 2020; Landier & Thesmar, 2020; Ramelli & Wagner, 2020). Given the extraordinary scale and unprecedented nature of the crisis, it is difficult to quantify the effect of the shock versus the impact of the ensuing economic policies. We add to this literature by examining the effects of the pandemic on stock returns of banks using an event study methodology. According to Borio (2020), banks entered this crisis with better capital buffers than in the GFC.<sup>7</sup> The documented increase in banks' risk premium suggest that markets expect that the banking sector would endure higher profit losses than other industries; perhaps as they absorb a large portion of the shock. Using the idea that asset prices can help evaluate expected profitability of firms in real time, we also contribute to the literature by evaluating the impact of different financial policy measures. For example, our evidence suggests that prudential policies are not associated with a reduction in the risk premium in high income countries, while markets seem to be pricing the reduced risk from borrower assistance measures, particularly in developed countries.

We also contribute to a longstanding literature that examines the role of policy initiatives during financial crisis (Claessens et al., 2005; Reinhart & Rogoff, 2009; Taylor & Williams, 2009). Ait-Shalia et al. (2012) examine the effects of policy announcements on liquidity risk premia and interbank credit during the GFC. While we also study the market response to policy initiatives, there are noticeable differences between the COVID-19 shock versus previous events of financial

---

<sup>6</sup> Expectation data for other types of announcements were not available.

<sup>7</sup> Although the sample only includes Basel Committee member countries.

and economic stress that grant further analysis. First, since the shock is truly exogenous to the financial sector, the overwhelming response from policymakers has been to relax regulatory requirements and use capital buffers: During our sample, 91% of countries used prudential measures. There is, however, no prior analysis of such a coordinated type of response, and no clear evidence about the medium- and long-term effects of these policies. To the best of our knowledge, our paper represents the first global analysis examining the market response to financial policy measures during the pandemic.

## 2. Data

We use data from Refinitiv on all publicly traded banks and non-bank financial companies across 53 countries between May 2, 2018 and May 1, 2020. The data set includes information on the daily stock prices, quarterly financial statements, and state ownership. We choose only stocks traded on major exchanges. Of the 4,978 stocks in the data, we drop 612 stocks that are not common stocks or are stocks with special features, such as depository receipts, real estate investment trusts, and preferred stocks. We further drop 1,084 stocks that traded less than 30% of the business days in each country throughout the sample period.<sup>8</sup> Finally, we drop from the dataset 211 banks that are owned by corporate groups whose core business is different from banking.

We use daily Brent crude oil prices to measure the degree to which an individual bank is exposed to the oil sector prior to the crisis. Specifically, we define oil sector exposure as the slope coefficient of an OLS regression of bank's stock returns on a constant, the market return where

---

<sup>8</sup>There are 28 firms in the sample with multiple ordinary shares. For these cases, we keep the stock with the highest trading volume.

the bank is domiciled, and the rate of return of oil prices estimated using weekly data between May 2018 and December 2019.

Our final sample comprises 3,043 firms, of which 896 are commercial banks and 2,147 correspond to non-bank financials. Panels A and B of Table A1 in the Appendix present the distribution of banks and non-bank financial companies across the countries in our sample. Table 1 displays the summary statistics of the variables of interest for the banks in the sample.

As Table 1 shows, the daily return of bank stocks from January to early May 2020 was on average -0.4 percent, with the median bank obtaining returns of -0.3 percent. 12 percent of the banks in the sample are classified as public owned.<sup>9</sup> However, as Table A2 in the Appendix shows, there is large heterogeneity in the share of public banks across regions. Whereas state-owned banks in India represent 53 percent of all publicly traded banks in the country, in high-income countries they constitute just 2 percent.

As a measure of ex-ante liquidity of banks, we calculate the cash-to-total assets ratios of banks and average them over the 2019Q1-2019Q4 period. The liquidity ratio of the median bank in the sample is 7 percent, with banks in the 25<sup>th</sup> percentile holding as little as 2 percent of cash and equivalents relative to their total assets.

Bank size is calculated as the 2019Q1-2019Q4 average of the total assets for each bank. We then take the Inverse Hyperbolic Sine (IHS) to smooth outliers in the distribution. The average size of banks in the sample is 24 IHS assets, which corresponds to 13.4 billion dollars. Regulatory

---

<sup>9</sup> We define public banks as those with a non-zero equity participation from the domestic government. Our findings are robust to alternative definitions of public banks where the minimum threshold of state ownership is set to 10% and 30%.

capital ratios of banks (i.e., total and tier 1 capital relative to total assets) are averaged over the 2019Q1-2019Q4 period. The average bank in the sample entered the COVID-19 crisis with a tier 1 and total capital ratios of 14.6 and 16 percent, respectively. Regarding our measure of exposure of banks to the oil sector, there is large heterogeneity around this measure, with the returns of banks in the 75<sup>th</sup> percentile experiencing a correlation with oil price returns of 0.23, compared to a correlation of -0.22 among banks in the 25<sup>th</sup> percentile.

### **3. Banks risk premium during the crisis**

We begin our analysis by comparing the stock price returns of banks with their overall domestic markets during the first months of the year (Panel A of Figure 1). By mid-February, the performance of banks and non-bank firms began deteriorating as a result of the pandemic with downward trajectories that followed each other closely. By late March, the stock prices of firms and banks had dipped to less than 70 and 60 percent of their initial levels of the year, respectively. Thereafter, non-bank firms began improving their performance in a steady rise, reaching almost 90 percent of their initial year levels by the beginning of May. However, such recovery was not experienced by banks, whose stock returns remained 70 percent below their initial year levels. This bank risk premium suggests that markets expect banks to absorb part of the losses of the corporate sector.

With the surge of the crisis, banks have underperformed not only relative to the market, but also relative to other financial companies. Panel B of Figure 1 zooms in on the sample of financial companies to compare the stock price returns of banks and non-bank financial firms. While banks and non-bank financial firms had a similar drop in their returns by end of March, in

the following month banks underperformed other non-bank financial firms.<sup>10</sup> This evidence further confirms that the drop in stock prices is not inherent to all financial firms but exclusive to banks, as investors appear to price the excess pressure that the banking sector is experiencing.

The bank risk priced-in by the market appears to vary across bank characteristics. Even though banks on average underperformed the market and other non-bank financial companies, private banks fared better than public ones (Panel A of Figure 2). Similarly, banks with greater cash holdings one year prior to the pandemic (i.e., banks above the 2019 median cash-to-total assets ratios) showed a superior performance than less liquid banks (Panel B of Figure 2). Ex-ante exposure to the oil industry also appeared to have imposed an extra burden for banks (Panel C of Figure 2). Banks with greater exposure to the oil sector (i.e., banks above the 75th percentile distribution of oil exposure) experienced lower returns after the COVID-19 crisis than less exposed banks. Somewhat surprisingly, the returns of smaller banks (i.e., banks below the 2019 median mean assets) outperformed those of larger banks after the large drop in stock prices of late March (Panel D of Figure 2). In terms of capital, investors did not appear to price the excess risks more heavily in lower capitalized banks (i.e., banks below the 2019 median Tier 1 capital ratio), as Panel E of Figure 2 shows.<sup>11</sup>

To test more rigorously the existence of a banking sector premium, we use regression analysis to examine the accumulated abnormal stock returns of banks during the crisis. Abnormal

---

<sup>10</sup> The average returns of firms in Panel A of Figure 1 are equally weighted across countries and are net of the returns of banks. To do this, we exclude the returns of banks from the returns of each country's stock market using the index weights of banks. The average returns of banks are weighted by the contribution of each bank to the total bank assets of each region. The regional average bank returns are then equally weighted across regions. The same approach is used to obtain the average return of non-bank financials.

<sup>11</sup> The average daily stock returns in Figure 2 are normalized to January 1, 2020. For each group of banks, we weight the average stock returns by the contribution of every bank to the assets of the group within a region. The regional average bank returns are then equally weighted across regions.

returns are the difference between realized returns and the expected returns implied by a market model. Specifically,

$$ARet_{b,t} = R_{b,t} - \hat{\alpha}_b - \hat{\beta}_b RM_t, \quad (1)$$

where  $ARet_{b,t}$  are the abnormal returns for bank  $b$  at time  $t$ ,  $R_{b,t}$  is the realized stock return of the bank, and  $RM_t$  is the market return. For each bank,  $\hat{\alpha}_b$  and  $\hat{\beta}_b$  are the intercept and slope coefficients, respectively, of an OLS regression of bank  $b$ 's stock returns on a constant and the domestic market return estimated using monthly data between May 2018 and December 2019.<sup>12</sup> We compute monthly cumulative abnormal returns, which is the variation in stock prices from the last day of a month to the last day of the following month.

The empirical analysis, outlined in equation 2, consists of cross-sectional regressions that relate the monthly cumulative abnormal returns of banks to a series of bank characteristics. The dependent variable  $ARet_{b,t}$  is the cumulative abnormal return of bank  $b$  from country  $c$  from month  $t-1$  to month  $t$ . We refer to *Liquidity risk<sub>b</sub>* as the bank illiquidity or liquidity risk interchangeably. To calculate this variable, we multiply the 2019 average cash holdings of bank  $b$  by -1. *Oil<sub>b</sub>* is the measure of exposure for each bank to the oil sector as explained above. *Size<sub>b</sub>* corresponds to the ex-ante total assets of a bank, measured in IHS. *Public bank<sub>b</sub>* is an indicator variable that equals

---

<sup>12</sup>As noted by Karolyi & Stulz, (2003), there are two alternatives in estimating the market model for a cross-country sample of stocks. The first estimates alpha and beta in the market model using a domestic market index, while the second uses a world market index. We present results using the “domestic CAPM” model and confirm most of our findings when we use the world CAPM model. We also calculate abnormal relative to a three-factor model (Fama & French, 1993), where, in addition to the market, we add size and book-to-market risk factors from the Kenneth French website.

one for government-owned banks and zero otherwise.<sup>13</sup>The coefficients  $\gamma_r$  are a set of region fixed effects and  $u_{b,c,t}$  is an error term clustered at the country level. Our final specification is as follows:

$$ARet_{b,c,t}^n = \alpha_0 + \alpha_1 Liquidity\ risk_b + \alpha_2 Oil\ exposure_b + \alpha_3 Size_b + \alpha_4 Public\ bank_b + \alpha_5 Capital_b + \gamma_r + u_{b,c,t} \quad (2)$$

The results of this exercise for the months January to April are summarized in Table 2. The constant term in the first column of each panel represents the abnormal return of the average bank during each month. During March and April, bank stocks significantly underperformed, with abnormal returns of approximately -6.6 and -3.2 percentage points respectively.

In January and February, the returns of banks were not related to their ex-ante cash holdings or to whether banks were state-owned or not. Banks more exposed to the oil sector appeared to enjoy slightly higher abnormal returns than less exposed banks. Similarly, in some specifications we find that larger and more capitalized banks seemed to experience higher returns during the first two months of the year. The liquidity premium appears by March, with ex-ante less-liquid banks experiencing a drop in abnormal returns of around 3.5 percentage points in addition to the average drop of -6.4 percentage points that banks experienced on average (Column 9). Also, in that month, the abnormal returns of banks more exposed to the oil sector were 1.4 percentage points lower than less exposed banks. The contraction in abnormal returns by March was more moderate for larger banks, whose returns dropped 4.3 percentage points.

---

<sup>13</sup> All covariates are standardized with mean 0 and standard deviation 1.

The decline in abnormal returns of less-liquid and more oil-exposed banks remained unchanged from March to April (Panel D). By April, public banks experienced a large and statistically significant drop in their abnormal returns of about 2.6 percentage points.

In addition, we estimate equation 2 using as dependent variable the excess returns of bank stocks relative to their domestic market. This variable is calculated by subtracting the returns of bank *b*'s domestic market from the bank's returns (i.e.,  $R_{b,t} - RM_t$ ).<sup>14</sup> In Figure 3, we compare the findings from estimating equation 2 using excess returns and the results with abnormal returns. As Panel A shows, banks' underperformance relative to their domestic market is more pronounced for less liquid banks, banks more exposed to the oil sector and larger banks. However, the negative returns of larger banks are not significant once we adjust for market risk. The returns of less liquid banks and banks with more exposure to the oil industry were abnormally low, with the gap continuing during April. Adjusting stock returns by market risk also reveals that public banks enjoyed significant abnormal returns in March, although by April these had become negative, as in the case of excess returns.<sup>15</sup>

Globally, banks entered the COVID-19 crisis better positioned to support the lending needs of the real economy. As documented by the BIS, the capital and liquidity buffers of banks at the onset of the crisis were substantially stronger than compared to the GFC (Borio, 2020; Lewrick et al., 2020). Through aggressive interventions in the financial markets, governments have encouraged banks to continue providing credit, in some cases by incentivizing them to draw down their buffers. While this time banks appear to be part of the solution to the crisis, the banking sector

---

<sup>14</sup> The results from this exercise are presented in Appendix Table A3.

<sup>15</sup> We further calculate abnormal returns relative to a global index and using the Fama-French 3 factor model. The results from these exercises are displayed in Tables A4 and A5 of the Appendix.



has also been hit hard by a rapid increase in the amount of credit losses and an extended uncertainty on the credit environment and duration of the crisis.

#### **4. Measuring the market response to financial sector distress policy initiatives**

What is the effectiveness of policy measures taken during the height of the crisis? To answer this question, in this section we evaluate the market response to different policy initiatives addressing the financial sector distress.

##### **4.1. Policy interventions**

We use data on the dates and types of major policy initiatives to support the financial sector and address the impact of the COVID-19 emergency. The data were compiled and made publicly available by the World Bank (World Bank, 2020). It covers policy measures in low, middle, and high-income countries. Information on each policy measure was collected from national authorities and international organizations. For each policy initiative, the dataset reports details on the announcement, and the day (and not the hour or minute) of the announcement which restricts our analysis to daily frequency. We classify approved measures that target the banking sector into the following categories: (i) liquidity support, (ii) prudential measures, (iii) borrower assistance, and (iv) monetary policy (Table 3).

*Liquidity support* deals with potential shortages in funding, either because precautionary demand for liquidity has increased or because of lack of access to funding (e.g., wholesale funding markets have dried up). Measures included are provisions of domestic currency liquidity through broadened access to central bank refinancing, extended collateral framework, such as those in the short-term and long-term repo market, and available foreign currency liquidity through swap agreements between central banks.

*Prudential measures* include temporary relaxation of certain key regulatory and supervisory requirements, including changes in capital requirements, limits on exposure, concentration, loan-to-value ratios, minimum reserve requirements, and cancelation of stress tests. By slowing down the decline in banks' regulatory capital ratios, these measures reduce the rate at which banks draw buffers down, spreading the recognition of losses and allowing a given amount of equity to support a larger lending volume.

*Borrower assistance* include measures to supply funds to firms and households due to the loss of revenue/income from the extended lockdowns. These include government liability guarantees for newly issued or existing wholesale financing, direct credit lines to strategic sectors, state support for interest-free loans and fully replenishable working capital financing. Other measures include enhancement of deposit protection schemes and simplified programs of loan restructuring.

*Monetary policy* are interest rate decisions (e.g., benchmark rate, repo rates, etc.), central bank purchases of government securities (*Quantitative Easing*), and credit easing, which typically consist of purchases of private sector debt in secondary markets. Given the different nature of conventional and unconventional monetary policy measures, we further split this category into *Policy Rate* announcements and *Asset Purchases* (both public and private bond buying programs and purchases of asset-backed securities).

Our final sample contains policies in 17 developed and 28 developing countries, for which we have stock market and policy data (Table 4). Some European countries such as, Austria, Finland, and Netherlands, did not have domestic financial policy initiatives. We include banks of these countries in days of announcements by the European Central Bank. Other Euro countries, for example, France, Germany, Italy, and Spain have both financial support policies taken at the

country level in addition to those taken by the monetary union authorities.<sup>16</sup> In total, the database includes 389 announcements between February 1 and April 17. Prudential measures accounted for the largest share of policy initiatives (36%), followed by borrower support, liquidity provision measures, monetary policy and asset purchases (23%, 21%, 12% and 8% respectively). However, the type of policies adopted differed substantially across countries (see Table A6 in the Appendix). While monetary policy announcements were frequent in developing countries (representing 22% of all measures), they only accounted for 4% in developed ones. In contrast, prudential measures in developed countries constituted 43% of all announcements, compared to 26% in developing countries.

Figure 4 presents the timing of policy announcements. Early in February, financial markets and financial authorities had little reaction to the original outbreak in China and the ensuing lockdown of Wuhan. On February 20, when Italy announced the quarantine of eleven municipalities in the northern region, and once it was apparent that the outbreak had also spread to South Korea, and Iran, stock markets declined sharply. By this date, only five countries had taken financial sector policy interventions. Among these, Russia, Thailand, China and Indonesia lowered their short-term interest rates and Japan launched a crisis loan package to small businesses.

Following a myriad of national quarantines starting with Italy on March 10, travel bans, including the U.S. decision on March 12 to severely restrict travel from the EU, stock markets around the world declined more than 30% from their peak. Interestingly, at this stage of the global crisis, most financial authorities were only taking conventional monetary policy actions, reducing short-term rates. For example, between February 20 and March 18, seventeen countries in our

---

<sup>16</sup> We also include eight policy announcements that were made during weekends. For these cases, we study the stock response using the first business day when the domestic stock market opened.

sample had announced policy rate cuts, and only a few had either taken measures to assist borrowers or announced prudential measures (e.g., Italy, Germany, U.K., and South Korea).

In response to the unprecedented, and rapidly evolving situation, policymakers increased the scope and number of measures to support the financial system. After March 18, most government and monetary authorities included liquidity support measures and borrower assistance. For instance, by April 17, 35 countries had taken some measure of direct borrower support, in most cases, dealing with SME financing. The use of countercyclical prudential rules also became ubiquitous; by the end of our sample, 40 countries had introduced prudential actions, typically through a temporary relaxation of certain key regulatory and supervisory requirements.

A large number of interventions were announced simultaneously with other financial sector policies. For example, prudential measures in developed countries were often announced on the same day of borrower support program announcements (Table A6 in the Appendix). However, as Tables A6 shows, there were also multiple single policy announcements for each of the policy categories we study. In developed countries, 42% of policies were announced on days with no other financial sector program announcements. This share is higher among developing countries, where 51% of policies were made on single announcement days.

## **4.2. Empirical methodology**

We use an event study technique (Brown & Warner, 1996; Kothari & Warner, 2007) to test the effect of policy announcements on the stock returns of banks. More specifically, we want to assess whether different policy initiatives convey new information about the ability of banks to properly operate during and after the crisis. Measuring bank-level stock returns instead of an aggregate index of bank stocks prices (or interbank credit and liquidity risk premia), allows us to

exploit variation across banks to better understand the market response to different types of policies.<sup>17</sup> For example, the cross-sectional analysis allows us to answer whether a specific type of government support measure favored a particular group of banks. Our focus is on the reaction of stock prices, as opposed to bond yields, because stocks are more frequently traded than bonds. Also, we do not use other bank-specific risk measures such as credit default swaps spreads, because these securities are not widely available for the majority of banks in developing countries.

To assess the stock market reaction to a policy announcement, we compute the accumulated abnormal stock returns of banks during the event. To be precise, we calculate accumulated abnormal returns over an event window  $n$ , which is the variation in the stock price one day prior to the announcement on day  $t$ , to  $n$  days after in excess to the expected returns implied by the market model ( $ARet_{b,t}^n$ ).

After calculating bank-level abnormal returns, we test whether policy announcements have significant effects on bank stock returns. In our benchmark specification, we test this hypothesis by estimating the following equation:

$$ARet_{b,c,t}^n = \alpha_{0,n} + \alpha_{1,n}Iliq_b + \alpha_{2,n}Oil_b + \alpha_{3,n}Size_b + \alpha_{4,n}Public_b + \gamma_c + \gamma_t + u_{b,c,t} \quad (3)$$

where  $ARet_{b,c,t}^n$  represents the abnormal return of bank  $b$  located in country  $c$  in day  $t$ , measured over the  $[-1, n]$  window (in days). The covariates are bank observables which include, bank illiquidity, oil exposure, and the indicator that captures whether the bank has state ownership. Finally,  $\gamma_c$  and  $\gamma_t$  are country and announcement date fixed effects. Standard errors are clustered at the country level.

---

<sup>17</sup> Correa et al. (2014) also use bank stock prices to evaluate another kind of shock – the downgrade of the sovereign credit risk.

We estimate equation (1) separately for each policy category. Since bank illiquidity, oil exposure, and bank size variables are standardized, the constant  $\alpha_{0,n}$  captures the abnormal stock returns of the average private bank for a type of announcement in the  $[-1, n]$  window. The coefficients  $\alpha_{1,n}$ ,  $\alpha_{2,n}$ ,  $\alpha_{3,n}$  and  $\alpha_{4,n}$  capture cross-sectional differences in the response of bank stock prices. For example,  $\alpha_{1,n} > 0$  would suggest that illiquid banks have higher accumulated abnormal returns than liquid banks during the event window for a specific type of announcement.

There are several challenges to our identification. First, owing to the high degree of global financial integration, there is extensive evidence of international spillovers from policy announcement by systemically important countries (Ait-Sahalia et al., 2012; Morais et al., 2019). To avoid contaminating the analysis from the effects of financial policy initiatives taken by core countries, we exclude data from days when the U.S. or European authorities made major announcements covering the same broad policy type category. For example, on a day when the U.S. authorities announced liquidity support measures, we keep data from stock returns of U.S. banks in the sample but exclude banks in countries that issue liquidity announcement on the same day.

Second, due to the nature and scale of the crisis, in some cases, national government authorities announced multiple financial measures during the same day. In such situations, and without intraday time stamp for each announcement category, it is difficult to disentangle the effect of each policy on bank stock prices. To deal with these confounding factors, we further condition our sample to country-dates where only policies of a particular category were announced, and report results for this restricted sample.

Finally, selecting the length of the event window has important tradeoffs. Limiting the size of the window helps to avoid contaminating the analysis of a given announcement's effect with other news; particularly in a period when pandemic-related news was heightened. If the event window is too narrow, there might not be enough time for market participants to internalize the context and implications of complex policy announcements. This is likely to be more pronounced in developing countries, where trading volume in secondary markets is small and the speed of transactions is slower (e.g., the pace of business at which risk is transferred across market participants is longer).<sup>18</sup> In turn, we use a five-day window, evaluating the change in stock prices from one day before the announcement to three days after, that is,  $n = \{0,1,2,3\}$ . We report accumulated abnormal returns for every day during this time window.

### **4.3. Impact of policy announcements**

As a benchmark to gauge the magnitude of the stock market effects, we first plot the average abnormal returns during the event window for each policy category, pooling banks across all countries. Abnormal returns are obtained from estimating equation (3) on a constant, removing all other covariates and using day and country fixed effects. The results are displayed in Figure 5 for the full sample (Panel A) and the restricted sample (Panel B) – when announcements of a particular category do not overlap with other initiatives. During our sample period, borrower assistance initiatives were strongly associated with large increases in the abnormal returns of bank stocks during the announcement day; 146 bps and 199 bps in the full and restricted sample respectively. We find that these large excess returns are present up to three days after the

---

<sup>18</sup> See for example Pedraza et al, (2019).

announcement. Borrower assistance initiatives typically include the introduction of government guarantees, which automatically transfer risks from banks' balance sheets to the sovereign.

On days when prudential measures and policy rate reductions were announced, bank stocks display positive but small abnormal returns in the full sample (45bps and 39bps respectively). These returns are quickly reversed within two days after the policy initiatives were announced. Notably, when we restrict the sample to single policy announcements, prudential measures seem to be accompanied by immediate price drops in bank stocks; 128 bps during the announcement day.<sup>19</sup> Prudential policies allow banks to run down some of their buffers to absorb the shock and send a strong signal about the resolve of policymakers. However, the fact that bank stock returns are negative might suggest that markets are also pricing the downside risk from the depletion of capital buffers.

Finally, we do not find evidence that liquidity support announcements had any aggregate short-term effects on bank stock prices. Although bank stocks seem to display positive abnormal returns when liquidity assistance measures are combined with other policies (Panel A in Figure 5), in the restricted sample, abnormal returns are small and statistically indistinguishable from zero.

The results on the cross-sectional impact of financial sector policies are presented in Table 5 and Figure 6.<sup>20</sup> While we present findings for the full and restricted sample, our preferred specification and discussion focuses on single policy initiatives. The constant in each model

---

<sup>19</sup> As Table A6 shows, in developed countries, 35 of the 99 prudential policy measures were jointly announced with borrower assistance initiatives. This might explain why in the full sample the net effect of prudential policies is higher than in the restricted sample.

<sup>20</sup> To present all the policies in a single table, we only include same-day estimates ( $n=0$ ) and three days after the announcement ( $n=3$ ). However, the figures display estimates during the entire event window.



represents the average abnormal returns of private banks in the sample. The results confirm our previous finding that borrower assistance measures are strongly associated with banks' stock price response. Other policy initiatives seem to have smaller or even negative aggregate effects on bank stocks.

#### *4.3.1 Liquidity Support*

Announcements of liquidity support are strongly associated with a reduction in the liquidity premium. That is, stocks of less liquid banks overperform after policymakers announce liquidity and funding measures. The coefficient for the liquidity premium can be read as follows: a bank with a liquidity premium measure of one-standard deviation higher than the average, experienced an additional 64 bps of abnormal returns on days when the government announced liquidity support policies (193 bps of abnormal returns accumulated over a four day window). The result is important because it confirms that central banks action helped alleviate the sharp tightening of financial conditions at the onset of the crisis. During March, due to the overwhelming volatility in securities and FX markets, many financial entities reported having difficulties in accessing funding, which is consistent with the sharp increase the liquidity premium in that month documented in Section 3. Overall, policies targeting funding availability (whether in domestic or foreign currency) appear to have a favorable impact in the reduction of the liquidity risk premium. We also see that stock prices of public banks and those of smaller banks benefit more from liquidity measures, potentially due to greater reductions in uncertainty these policies provide to these banks.

#### *4.3.2 Prudential measures*

In addition to having a negative impact on aggregate bank stock prices, prudential measures do not seem to be associated with clear reductions in the liquidity premium. The use of buffers,

facilitation of loan restructuring, and other measures that require regulatory forbearance (e.g., loan moratoria and different treatment of non-performing loans), might help support credit flow throughout the lockdowns, but they entail large risks in the medium term, threatening financial stability. It appears that markets are pricing these risks, since abnormal returns are negative. Furthermore, our evidence indicates that the effect of prudential measures is undistinguishable across banks, irrespective of their liquidity ratios and exposure to the oil sector. Our results suggest that stocks of larger banks displayed higher abnormal returns after prudential measures were announced, although the magnitude of this effect is small and only statistically significant on the announcement day.

#### *4.3.3 Borrower assistance*

Announcements of borrower assistance were associated with large increases in abnormal returns of bank stocks. Recognizing the severity of the shock, especially to small non-essential businesses that would be unable to cover operating costs during extended lockdowns, many countries enhanced their public liability guarantees programs, with government guarantees up to 90% of loan values. Fiscal resources were also committed to subsidize interest-free loans and directly fund strategic sector during the pandemic. These initiatives generate large fiscal costs in the short term, while transferring the credit risks from banks to the government. It appears that markets internalize this information as good news for the banking industry, which could now offload part of the burden of the shock to the sovereign.

Announcements of borrower support programs had a greater impact among less liquid banks. Concretely, three days after an announcement, the abnormal returns of a bank with a liquidity ratio one-standard deviation below the mean increase in 87bps. Additionally, larger banks experience higher abnormal returns during borrower support announcements. For instance, a bank

that is one-standard deviation above the mean in size, experiences an additional 98bps of abnormal returns up to three days after the announcement. Ornelas et al., (2019) document that during the GFC, large banks disproportionately benefited from allocating government-sponsored credit. While loans that are funded with government resources typically have interest rate ceilings, banks offset the lower revenue from these loans by extracting rents in other lending products to the recipients of government support. Smaller banks and those that operate in niche markets are less able to take advantage of cross-selling and enhanced sales in other products.

When we split the sample into developed and developing countries, we find that the positive association between excess stock returns and borrower support initiatives are exclusive to developed countries (see Table 6 and Figure 6). As noted above, borrower assistance requires potentially large fiscal commitments. In developing countries, authorities have lower fiscal space to operate, and markets might anticipate that the extent of the borrower assistance measures in such settings is limited. On the contrary, fiscal authorities in developed countries can pledge significant resources to help distressed households and firms, which in turn reduce bank risk.

#### *4.3.3 Monetary policy*

Interest rate cuts were associated with significant declines in the liquidity risk premium. To be precise, during days of policy rate cuts, banks with lower liquidity experienced higher abnormal returns than more liquid banks (full and restricted sample in Table 5). The significant relative increase in abnormal stock returns of illiquid banks may have reflected markets' expectation that lower interest rates would increase liquidity in the financial system, thereby benefiting banks with larger funding risks. The result also confirms that the interest rate policy remained a key policy tool at the onset of the crisis, since markets are familiar with conventional monetary policy.

Banks with more exposure to the oil shock seem to benefit less from interest rate actions, as evidenced in both the full and restricted sample. The result highlights the key difference between liquidity and solvency risks. Banks that are heavily exposed to the oil sector are more susceptible to losses due to the likelihood of defaults in this industry. To the extent that markets internalize that the profitability of these banks will be lower, interest rate cuts would have small effects. On the other hand, banks with short-term liquidity constraints, but with less exposed portfolios, stand to benefit more from the ease in funding conditions.

Announcement concerning asset purchases were also followed by increases in the abnormal returns of illiquid banks, albeit with marginal statistical significance in the restricted sample. We interpret this finding as evidence that unconventional monetary policy also played a role in reducing the liquidity risk premium.

Since announcements should have a greater impact if they are unexpected than if they are expected, we further restrict our sample to days with monetary policy surprises. That is, we restrict our sample to days when the monetary authority made policy rate announcements after emergency meetings, or when the domestic policy rate cut was larger than the expected by market analysts.<sup>21</sup> We further confirm earlier findings with the sample of unexpected monetary policy announcements. Although surprises of interest rate cuts were not associated with significant increases in bank stock prices, such announcements did appear to have differential effect across banks. For instance, monetary policy surprises were associated with declines in the liquidity risk

---

<sup>21</sup> According to the Reuters forecast based on the one-week analyst survey of benchmark rates. Some examples of monetary policy surprises include Thailand's 25bps cut in the benchmark rate (February 5), Canada's repo rate cut of 50bps (March 4), and the United Kingdom 50bps repo rate cut during the emergency meeting of March 11. The only case in which the rate cut was smaller than expected was in Thailand on March 20. We drop this date from the sample of monetary policy surprises.

premium and seemed to be more beneficial for banks with lower exposure to the oil sector (Table A7 in the Appendix).

## **5. Conclusions**

The spread of COVID-19 represents an unrepresented global shock, with the disease itself and mitigation efforts –such as social distancing measures and partial and national lockdowns measures– both having a significant impact on the economy. In the immediate aftermath, the financial sector, particularly banks, were expected to play an important role in absorbing the shock by supplying vital credit to the corporate sector and households. In an effort to facilitate this, central banks and governments around world enacted a wide range of policy measures to provide greater liquidity and support the flow of credit. An important policy question is the potential impact of these countercyclical lending policies on the future stability of the banking systems and to what extent their strengthened capital positions since the global financial crisis will allow them to absorb this shock without undermining their resilience.

In this paper, we use daily stock prices and other balance sheet information for a sample of banks in 53 countries to take a first look at this issue. Our contribution is twofold. We first assess the impact of the pandemic on the banking sector and investigate whether the shock had a differential impact on banks versus corporates, as well as those banks with different characteristics. Second, using a global database of financial sector policy responses and an event study methodology, we investigate the role of different policy initiatives on addressing bank stress as perceived by markets, in the aggregate, as well as across different banks.

Our results suggest that the adverse impact of the COVID-19 shock on banks was much more pronounced and long-lasting than on the corporates as well as other non-bank financial

institutions, revealing the expectation that banks are to absorb at least part of the shock to the corporate sector. Furthermore, larger banks, public banks, and to some extent better capitalized banks suffered greater reductions in their stock returns, reflecting their greater anticipated role in dealing with the crisis. Banks with lower pre-crisis liquidity and oil sector exposure also suffered greater reduction in returns, consistent with their greater vulnerability to such a shock.

Investigating close to 400 policy announcements between February and April 2020, we next evaluate the impact of liquidity support, prudential measures, borrower assistance and monetary policy measures on bank abnormal returns. Our results suggest liquidity support and borrower assistance measures had the greatest positive impact on bank abnormal returns. Illiquid banks benefited most from liquidity support, whereas larger banks and public banks saw increased abnormal returns with the announcement of borrower assistance policies. However, since they rely on fiscal expenditures, these policies did not result in positive impact on bank stock prices in developing countries where there is less room for fiscal expansion. Prudential measures appeared to have a negative impact on bank returns, suggesting that markets price the downside risk from depletion of capital buffers. Finally, policy rate cuts and assets purchases mostly benefited illiquid banks and public banks, confirming that monetary policy again played a key tool during this crisis.

Overall, our results suggest that the crisis and the countercyclical lending role they are expected to play has put banking systems around the world under stress, having a differential impact depending on their characteristics and pre-crisis vulnerabilities. While some policy measures such as liquidity support, borrower assistance and monetary easing moderated this adverse impact for some banks, this is not true for all banks or in all circumstances. For example, borrower assistance measures exacerbated the stress for banks that operate in countries with little

fiscal space. These vulnerabilities will need to be carefully monitored in the coming year as the pandemic continues to take its toll on the world economies.

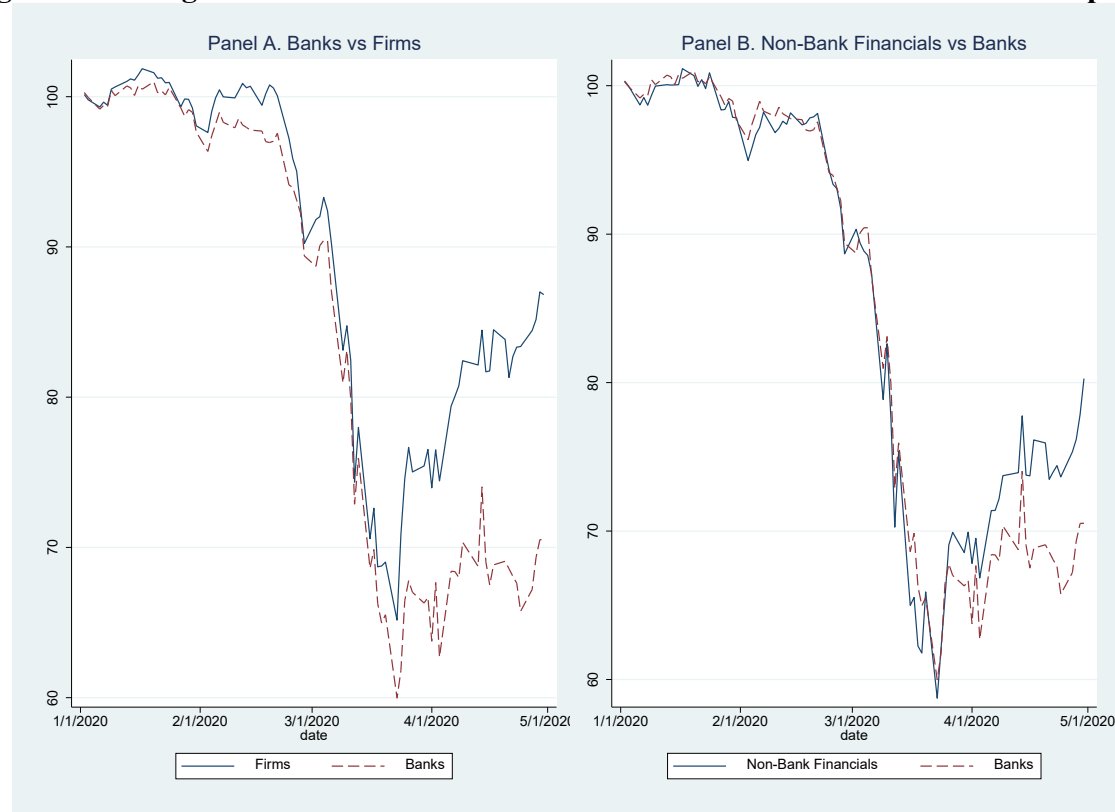
## References

- Acharya, V., & Steffen, S. (2020). The risk of being a fallen angel and the corporate dash for cash in the midst of COVID. *CEPR COVID Economics*, 10.
- Ait-Sahalia, Y., Andritzky, J., Jobst, A., Nowak, S., & Tamirisa, N. (2012). Market response to policy initiatives during the global financial crisis. *Journal of International Economics*, 87, 162-177.
- Baker, S., Bloom, N., Davis, S., & Terry, S. (2020). Covid-induced economic uncertainty. *National Bureau of Economic Research*.
- Borio, C. (2020). *The prudential response to the Covid-19 crisis*. Bank of International Settlements.
- Brown, S. J., & Warner, J. B. (1996). Using daily stock returns: The case of event studies. *Journal of Financial Economics*(14), 3-31.
- Claessens, S., Klingebiel, D., & Laeven, L. (2005). Crisis resolution, policies, and institutions: empirical evidence. In *Systemic Financial Distress: Containment and Resolution*. Cambridge: Cambridge University Press.
- Correa, R., Lee, K.-H., Sapriza, H., & Suarez, G. (2014). Sovereign credit risk, banks' government support, and bank stock returns around the world. *Journal of Money, Credit and Banking*, 46(1), 93-121.
- Drehmann, M., Farag, M., Tarashev, N., & Tsatsaronis, K. (2020). *Buffering Covid-19 losses: The role of prudential policy*. Bank of International Settlements.
- Fama, E., & French, K. (1993). Common risk factors in the returns of stocks and bonds. *Journal of Financial Economics*, 81(3), 3-56.
- Gormsen, N., & Koijen, R. S. (2020). Coronavirus: Impact on stock prices and growth expectations. *University of Chicago, Becker Friedman Institute of Economics Working Paper*.
- Guerrieri, V., Lorenzoni, G., Straub, L., & Wening, I. (2020). Macroeconomic implications of COVID-19: Can negative supply shocks cause demand shortages? National Bureau of Economic Research.
- Karolyi, A., & Stulz, R. (2003). Are financial assets priced locally or globally? In *Handbook of the Economics of Finance* (pp. 975-1020). Amsterdam: Elsevier.
- Kothari, S. P., & Warner, J. B. (2007). Econometrics of event studies. In *Handbook of empirical corporate finance* (pp. 3-36). Elsevier.
- Landier, A., & Thesmar, D. (2020). Earnings expectations in the covid crisis. *National Bureau of Economic Research*.
- Morais, B., Peydro, J.-L., & Roldan Peña, J. O.-R. (2019). The international bank lending channel of monetary policy. *Journal of Finance*, 74(1), 55-90.
- Ornelas, J. R., Pedraza, A., Ruiz-Ortega, C., & Silva, T. (2019). Winners and losers when private banks distribute government loans. *World Bank*.



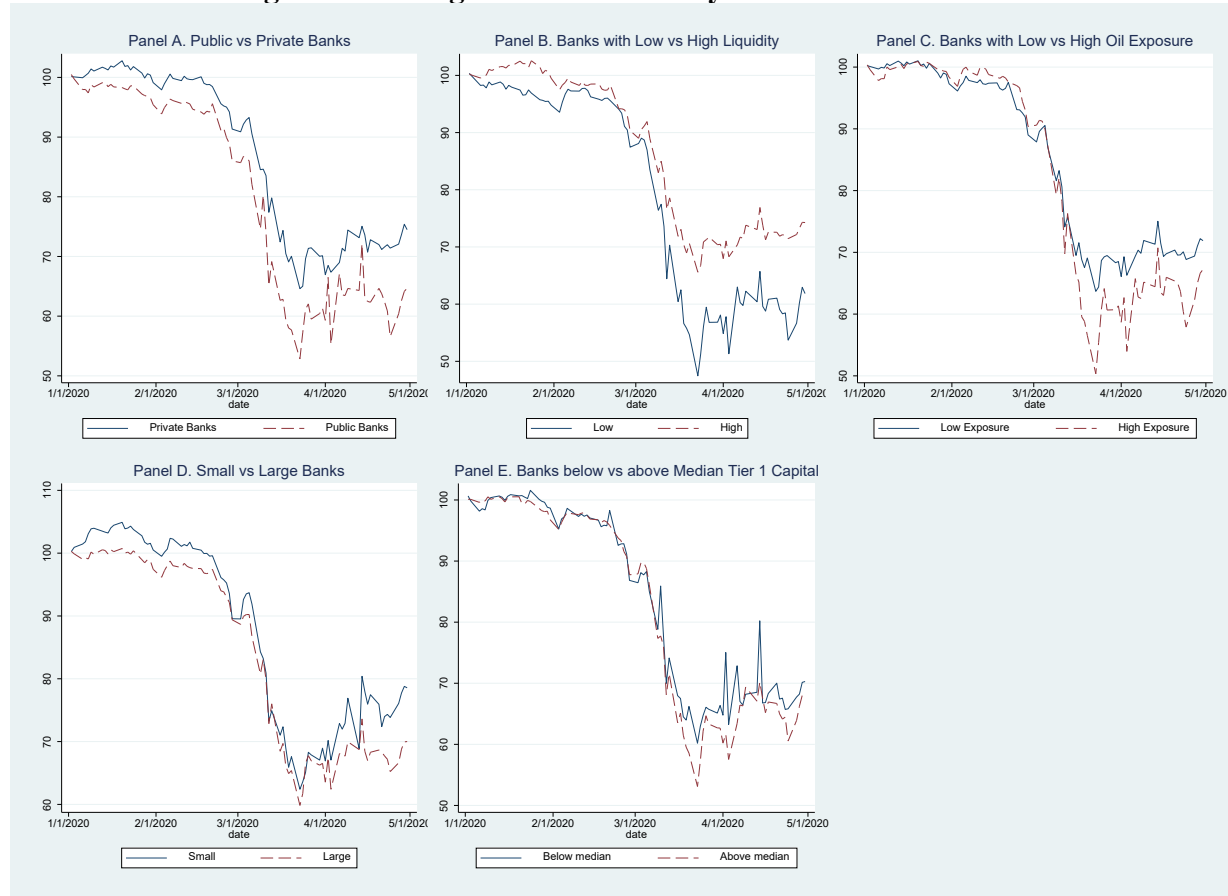
- Pedraza, A., Pulga, F., & Vasquez, J. (2019). Costly index investing in foreign markets. *Journal of financial markets*, <https://doi.org/10.1016/j.finmar.2019.100509>.
- Ramelli, S., & Wagner, A. (2020). Feverish stock price reactions to covid-19.
- Reinhart, C. M., & Rogoff, K. S. (2009). *This time is different: Eight centuries of financial folly*. Princeton University Press.
- Taylor, J., & Williams, J. (2009). A black swan in the money market. *American Economic Journal: Macroeconomics*, 1(1), 58-83.
- World Bank, G. (2020, June 16). *Covid-19 finance sector related policy responses*. Retrieved from <https://datacatalog.worldbank.org/dataset/covid-19-finance-sector-related-policy-responses>

**Figure 1. Average Stock Returns of Banks vs Firms and Non-Bank Financial Companies**



Notes: The figures plot average daily stock market returns of banks, firms and non-bank financials in the sample normalized to January 1, 2020. The average returns of firms in the first figure are equally weighted across countries and are net from bank returns. To calculate them, we exclude the returns of banks from the returns of each country's stock market using the index weights of banks. The average returns of banks are weighted by the contribution of each bank to the total bank assets of each region. The regional average bank returns are then equally weighted across regions. The same approach is used to obtain the average return of non-bank financials.

**Figure 2. Average Stock Returns by Bank Characteristics**

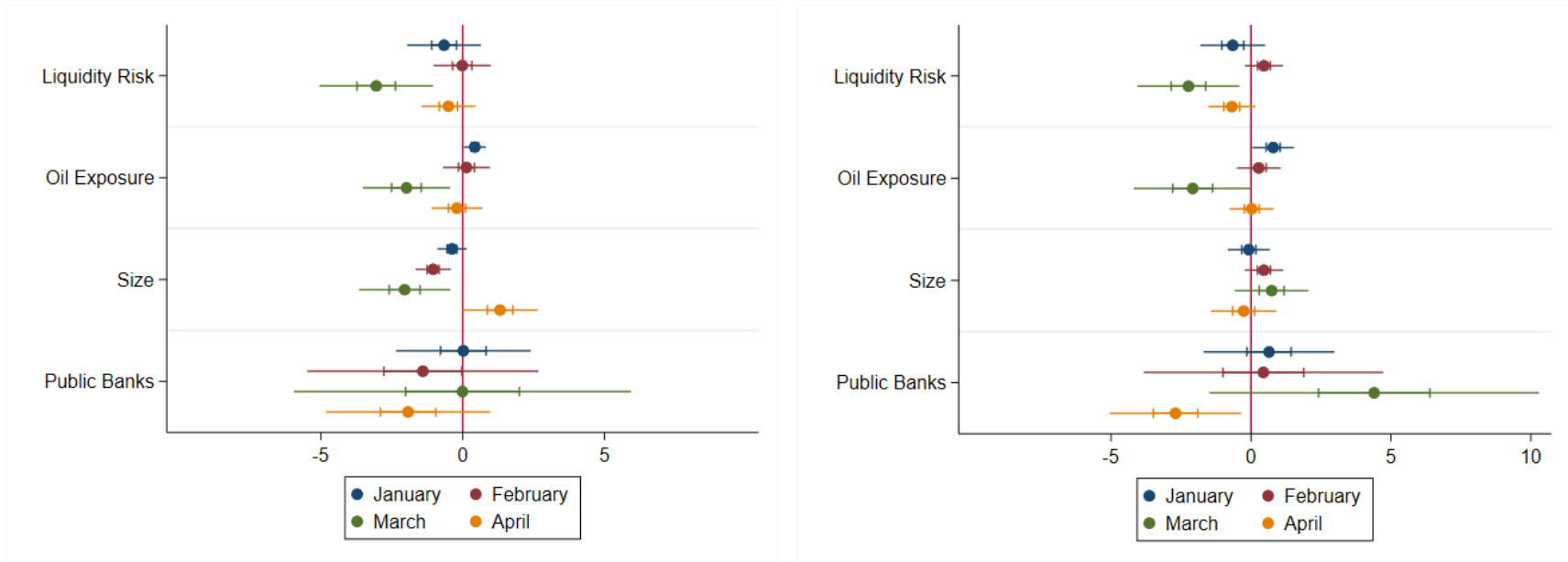


Notes: The figures plot average daily stock returns of all banks in the sample normalized to January 1, 2020. We classify banks according to their ownership as well as their 2019Q1-2019Q4 average liquidity, degree of exposure to the oil sector, total assets and Tier 1 capital ratio. Banks are classified as public-owned if the government has equity participation in them, and private otherwise. We split banks into below and above the median of their 2019Q1-2019Q4 averages of liquidity, size and Tier 1 capital. Banks are considered highly exposed to the oil sector if their degree of exposure is above the 75<sup>th</sup> percentile exposure. For each group of banks, we weight the average stock returns by the contribution of every bank to the bank assets of the group within a region. The regional average bank returns are then equally weighted across regions.

**Figure 3. Risk factors estimated by month**

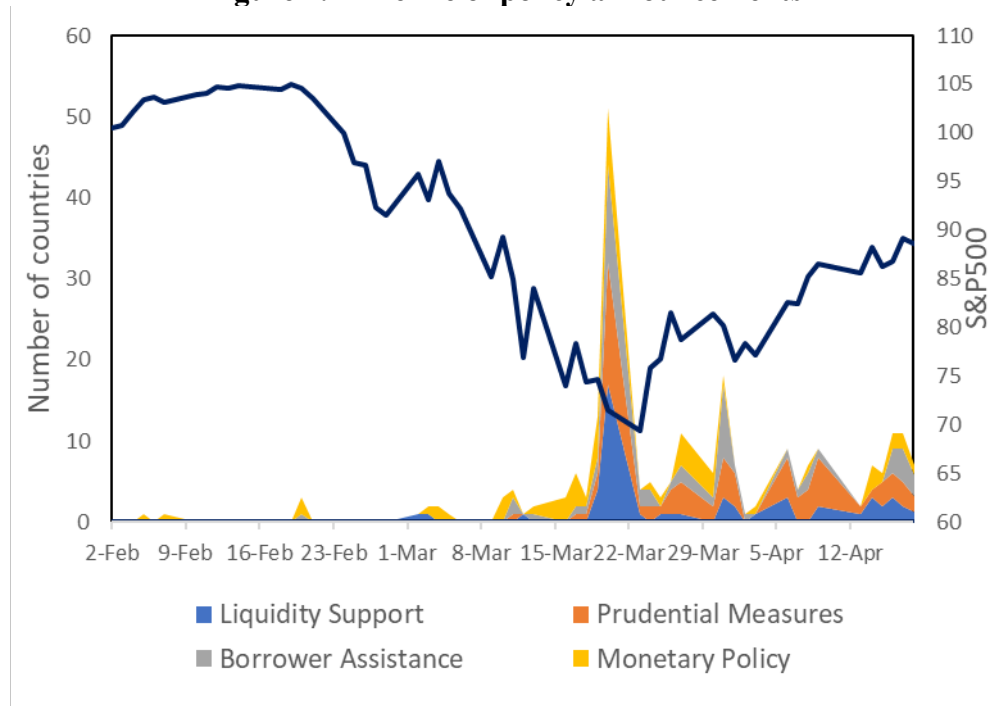
**Panel A. Excess Returns**

**Panel B. Abnormal returns**



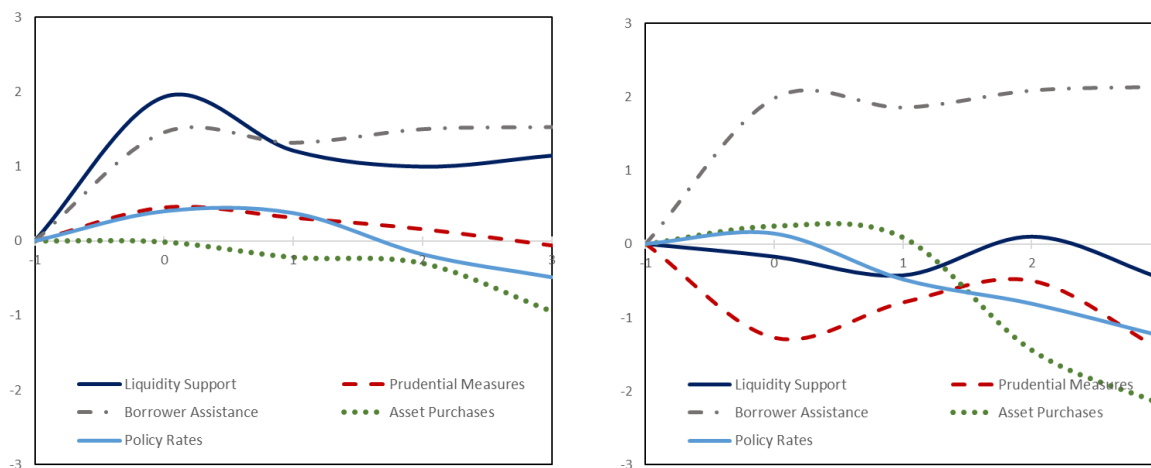
Notes: Coefficients from monthly cross-sectional regression on excess stock returns (Panel A) and abnormal returns (Panel B) of banks. Liquidity risk, oil exposure, and size are standardized. “Public banks” is a dummy variable equal to 1 if the bank is state-owned and zero otherwise. Regressions include regional fixed effects with standard errors clustered at the country level.

**Figure 4. Timeline of policy announcements**



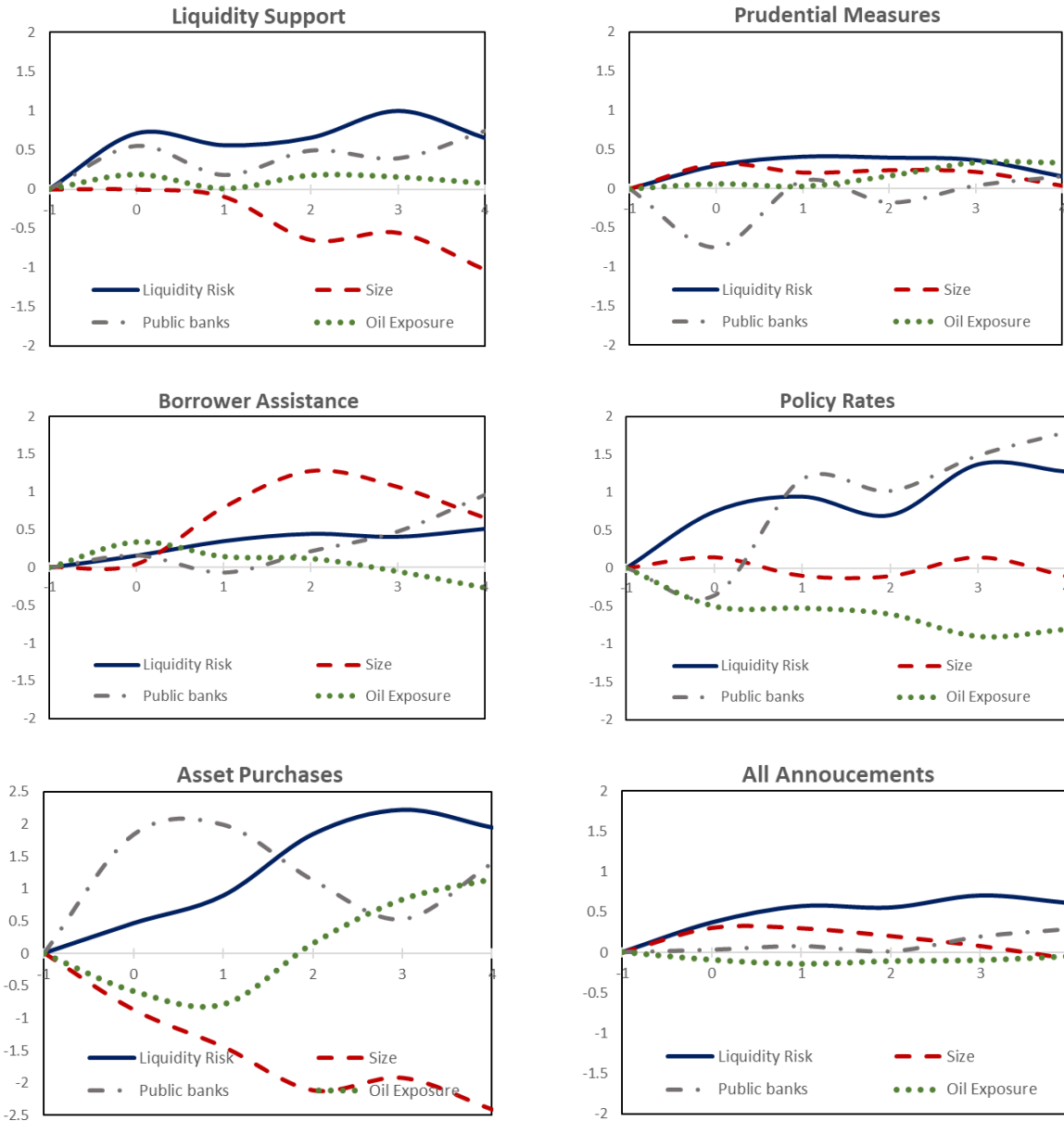
Notes: Number of countries with at least one policy announcement (by category).

**Figure 5.** Abnormal returns of bank stocks around the announcement window  
**Panel A.** Full sample  
**Panel B.** Restricted sample



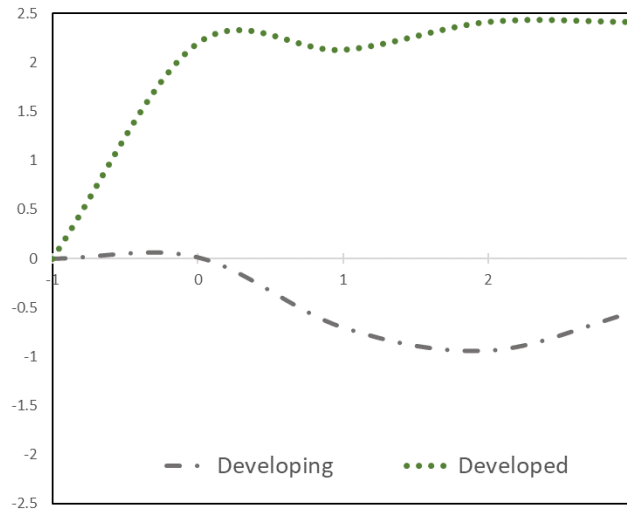
Notes: The variable plotted on the vertical axis shows the accumulated abnormal returns in percentage points within the event window of one day before the event and three days after the event, scaled to zero on the day before the announcement. Accumulated abnormal returns are averaged across banks for each policy category. The horizontal axis shows days within the event window, with "0" corresponding to the day of the announcement.

**Figure 6.** Cross-sectional impact of policy announcements (in percentage points)



Notes: Estimated slope coefficients of OLS regressions estimating daily accumulated abnormal returns on bank characteristics. Liquidity risk, oil exposure, and Size are standardized. “Public banks” is a dummy variable equal to 1 if the bank is state-owned and zero otherwise. The horizontal axis shows days within the event window, with “0” corresponding to the day of the announcement.

**Figure 7.** Abnormal returns of bank stocks after borrower assistance announcements: developed vs. developing countries



Notes: The variable plotted on the vertical axis shows the accumulated abnormal returns in percentage points for borrower assistance policies within the event window of one day before the event and three days after the event, scaled to zero on the day before the announcement. Accumulated abnormal returns are calculated by estimating equation (3) on a constant removing all other covariates and including country and announcement day fixed effect. The sample is split between developed and developing countries. The horizontal axis shows days within the event window, with "0" corresponding to the day of the announcement.



**Table 1. Summary statistics of banks**

Variable	Mean	SD	P25	P50	P75	Obs
Stock returns	-0.004	0.003	-0.005	-0.003	-0.002	896
Public-owned bank	0.12	0.32	0.00	0.00	0.00	880
Liquidity ratio	0.14	0.47	0.02	0.07	0.11	755
Assets (IHS)	24.0	2.2	22.2	24.0	25.3	767
Tier 1 capital ratio	14.6	5.8	11.8	13.3	16.2	583
Total capital ratio	16.0	6.1	13.1	14.9	17.8	651
Exposure to oil sector	0.06	1.23	-0.22	0.02	0.23	894

Notes: The table presents summary statistics of the 896 banks across the 53 countries in the sample. Stock returns for each bank are averaged over the period January 1, 2020 to May 5, 2020. Assets, liquidity, capital ratios and exposure to the oil sector are calculated using data prior to COVID-19 (from 2019Q1 to 2019Q4). Assets correspond to the average total assets of a bank over time and are measured using the inverse hyperbolic sine (IHS) function. We define liquidity as the average ratio of cash and equivalents kept by a bank over its total assets. Tier 1 capital and Total capital ratios are the average regulatory ratios reported by banks. To measure the degree of exposure of a bank to the oil sector, we run an OLS regression of the bank's daily stock returns as a function of a constant term, the market return where the bank is located and the returns of oil prices for the period May 1, 2018 to December 31, 2019. The exposure to the oil sector of each bank is given by the coefficient of the return of oil prices in this regression.

**Table 2. Risk factors during the COVID-19 crisis**

	Panel A. January			Panel B. February			Panel C. March			Panel D. April		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Liquidity risk	-0.703 [0.581]	-0.714 [0.585]	-0.631 [0.550]	0.387 [0.336]	0.380 [0.348]	-0.059 [0.370]	<b>-2.166**</b> <b>[0.933]</b>	<b>-2.241**</b> <b>[0.926]</b>	<b>-3.495***</b> <b>[0.903]</b>	-0.747* [0.434]	-0.702 [0.424]	-0.790 [0.482]
Oil exposure	0.740* [0.377]	0.735* [0.376]	0.588 [0.477]	0.214 [0.408]	0.211 [0.406]	0.622 [0.403]	<b>-2.151**</b> <b>[1.046]</b>	<b>-2.185**</b> <b>[1.050]</b>	<b>-1.420*</b> <b>[0.752]</b>	-0.042 [0.388]	-0.021 [0.393]	-0.110 [0.427]
Size	-0.086 [0.382]	-0.124 [0.379]	-0.458 [0.461]	0.516 [0.378]	0.494 [0.362]	0.724* [0.373]	<b>1.013</b> <b>[0.636]</b>	<b>0.771</b> <b>[0.631]</b>	<b>2.047*</b> <b>[1.013]</b>	-0.499 [0.622]	-0.352 [0.606]	-0.730 [0.765]
Public banks		0.675 [1.163]	1.185 [1.230]		0.394 [2.129]	0.338 [2.217]		4.360 [2.918]	3.512 [3.272]		-2.635** [1.177]	-2.174* [1.129]
Total capital			0.316 [0.438]			0.717* [0.389]			-2.111 [1.381]			-0.095 [0.413]
Constant	-1.416*** [0.502]	-1.476*** [0.538]	-1.864*** [0.567]	0.064 [0.373]	0.029 [0.419]	0.000 [0.410]	-6.644*** [1.502]	-7.030*** [1.567]	-6.359*** [1.352]	-3.197*** [0.562]	-2.964*** [0.555]	-3.355*** [0.491]
Observations	737	737	643	738	738	643	738	738	643	738	738	643
R-squared	0.089	0.089	0.107	0.060	0.061	0.087	0.104	0.110	0.163	0.023	0.027	0.029
Fixed Effects	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region
Cluster	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Notes: Cross sectional regressions of monthly abnormal returns of banks. Abnormal returns are the difference between realized returns and the expected returns implied by a market model. All specifications include region fixed effects. Standard errors are clustered at the country level.

**Table 3. Policy announcements**

Type	Total	Examples		
Liquidity Support	183	Reserve requirements rate for deposits down to 25% from 31%	Brazil	21-Mar
		Establishment of buy/sell USD/INR Swap line with US Fed (Australia, Brazil, Denmark, Norway, Mexico, South Korea, Singapore, Sweden, New Zealand)	Several countries	20-Mar
		The Ministry of Finance to sell dollars during 2020 for up to US \$ 9.4 billion. Corporate bonds will be included as eligible collateral for all the effective liquidity operations in pesos	Chile	20-Mar
Prudential	333	loan deferment programs for 6 months for the financially vulnerable individuals	South Korea	11-Mar
		6 months forbearance (considering extending to 10 months) on all insured mortgages	Canada	20-Mar
		Banks countercyclical capital buffer cut to 0% starting April 1	Germany	21-Mar
		Italy: Moratorium on credits, for both companies and consumers. (March 21)	Italy	21-Mar
		Grant temporary regulatory flexibility so that banks can use their capital buffers	Mexico	8-Apr
		Reserve Bank lowered Pillar 2A capital buffer to zero	South Africa	6-Apr
Borrower Support	151	Package of \$15 billion for small business loans	Japan	11-Mar
		Ministry of Finance will guarantee up to 80% of the value of financing provided to SMEs. Until March 31, 2021 the MoF will subsidize 100% of interest on loans for micro and SMEs.	Romania	20-Mar
		Instrument aimed at limiting interest rates on loans to borrowers, a new instrument is introduced with a refinancing limit of UB 500 billion in order to maintain lending to SMEs.	Russia	31-Mar
Asset Purchases	22	Large scale purchase of government bonds from the secondary market	Poland	31-Mar
		Authorized the purchase of government bonds in the secondary market for up to \$ 2 billion	Colombia	14-Apr
		The Fed announced QE purchases of USD500bn of Treasuries and USD200bn of agency MBS	United States	20-Mar
Policy Rates	95	Cut its benchmark interest rate by 25 basis point, taking it to a record low 1%	Thailand	5-Feb
		On 2/20, BI cut its seven-day reverse repo rate by 25 basis points to 4.75 percent, marking the first cut in the BI policy rate since October.	Indonesia	20-Feb
		Benchmark rate cut to 9.75% from 10.75%	Turkey	21-Mar

**Table 4. Number of days with policy announcements**

Country	First date	Last date	Liquidity	Prudential	Borrower Support	Asset Purchases	Policy Rates
Argentina	5-Mar	5-Apr	1	1	2	0	1
Australia	1-Mar	17-Apr	2	6	0	0	2
Austria	12-Mar	16-Apr	3	7	4	2	0
Brazil	2-Mar	16-Apr	7	5	3	0	1
Bulgaria	19-Mar	15-Apr	1	2	4	0	0
Canada	4-Mar	15-Apr	0	3	0	2	3
Chile	20-Mar	20-Mar	1	0	1	0	1
China	20-Feb	15-Apr	2	1	2	0	3
Colombia	20-Mar	16-Apr	3	1	1	2	1
Croatia	20-Mar	31-Mar	1	0	1	0	0
Egypt	24-Mar	16-Apr	0	2	1	0	0
Finland	12-Mar	16-Apr	3	7	4	2	0
France	12-Mar	16-Apr	3	10	6	2	0
Germany	12-Mar	16-Apr	3	9	6	2	0
Hong-Kong	4-Mar	18-Apr	0	3	1	0	2
India	20-Mar	17-Apr	5	2	1	0	2
Indonesia	20-Feb	14-Apr	2	1	0	1	2
Ireland	12-Mar	16-Apr	3	7	4	2	0
Italy	1-Mar	16-Apr	3	9	7	2	0
Japan	20-Feb	15-Apr	0	2	2	0	1
Malaysia	3-Mar	27-Mar	2	1	1	0	1
Mexico	12-Mar	15-Apr	3	4	1	0	1
Morocco	17-Mar	27-Mar	1	1	0	0	1
Netherlands	12-Mar	16-Apr	3	7	4	2	0
Nigeria	18-Mar	20-Mar	1	1	2	0	0
Pakistan	17-Mar	16-Apr	1	1	1	0	3
Peru	19-Mar	17-Apr	2	2	3	0	1
Philippines	20-Mar	16-Apr	2	0	0	1	2
Poland	20-Mar	8-Apr	1	1	1	1	2
Portugal	12-Mar	16-Apr	3	7	4	2	0
Qatar	10-Mar	10-Mar	0	0	0	0	1
Romania	20-Mar	9-Apr	2	2	1	1	1
Russia	7-Feb	17-Apr	1	4	1	0	1
Saudi-Arabia	10-Mar	16-Mar	0	0	0	0	2
Singapore	16-Apr	16-Apr	0	1	0	0	0
South-Africa	19-Mar	14-Apr	2	5	1	1	2
South-Korea	11-Mar	13-Apr	2	6	3	0	1
Spain	12-Mar	16-Apr	3	8	5	2	0
Sweden	6-Apr	14-Apr	2	0	0	0	0
Thailand	5-Feb	20-Mar	0	1	0	0	2
Turkey	17-Mar	17-Apr	2	1	1	1	1
UAE	10-Mar	10-Mar	0	0	0	0	1
UK	11-Mar	17-Apr	2	4	6	1	2
US	15-Mar	17-Apr	5	6	2	1	1
Vietnam	17-Mar	17-Apr	0	0	2	0	1

Notes: Data obtained from the World Bank (World Bank, 2020) covering the period February 1 to April 17 2020.

**Table 5. Impact of policy initiatives**

n =	Liquidity Support		Prudential Meas.		Borrower Assist.		Asset Purchases		Policy Rates		All announcements	
	0	3	0	3	0	3	0	3	0	3	0	3
<b>Full sample: days with multiple domestic policy announcements</b>												
Liquidity risk	0.713*** [0.267]	0.999** [0.455]	0.295* [0.173]	0.364 [0.292]	0.348** [0.159]	0.509* [0.299]	0.463 [0.360]	2.215*** [0.734]	0.744** [0.291]	1.369*** [0.513]	0.373*** [0.116]	0.711*** [0.206]
Oil exposure	0.187 [0.180]	0.153 [0.310]	0.065 [0.143]	0.337 [0.244]	0.143 [0.174]	-0.267 [0.344]	-0.579 [0.391]	0.832 [0.807]	-0.505*** [0.180]	-0.901*** [0.315]	-0.090 [0.096]	-0.094 [0.173]
Size	-0.002 [0.191]	-0.554* [0.328]	0.321** [0.136]	0.218 [0.235]	0.793*** [0.184]	0.656* [0.353]	-0.874** [0.404]	-1.925** [0.830]	0.145 [0.263]	0.145 [0.457]	0.305*** [0.101]	0.081 [0.184]
Public banks	0.550 [0.533]	0.392 [0.903]	-0.755 [0.502]	0.042 [0.846]	-0.065 [0.628]	0.959 [1.162]	1.836** [0.917]	0.523 [1.876]	-0.362 [0.464]	1.485* [0.807]	0.030 [0.301]	0.194 [0.532]
Constant	1.598*** [0.187]	0.725** [0.318]	0.419*** [0.132]	-0.234 [0.223]	1.314*** [0.131]	1.272*** [0.250]	0.051 [0.344]	0.428 [0.715]	0.532** [0.236]	-0.749* [0.415]	0.536*** [0.082]	-0.021 [0.147]
Observations	774	762	1,348	1,319	573	558	115	113	377	373	2,408	2,358
R-squared	0.292	0.484	0.364	0.452	0.426	0.248	0.171	0.269	0.268	0.258	0.323	0.338
<b>Restricted sample: days with single domestic policy announcements</b>												
Liquidity risk	0.643 [0.466]	1.929** [0.948]	0.077 [0.208]	0.156 [0.356]	0.546*** [0.199]	0.866** [0.365]	0.326 [0.505]	1.867* [0.966]	0.537* [0.281]	1.415*** [0.463]	0.321** [0.125]	0.786*** [0.227]
Oil exposure	-0.217 [0.273]	-1.037* [0.554]	-0.214 [0.194]	0.194 [0.335]	0.123 [0.202]	-0.059 [0.392]	-0.279 [0.853]	-0.519 [1.635]	-0.632*** [0.181]	-0.816*** [0.297]	-0.280*** [0.106]	-0.376* [0.197]
Size	-0.948** [0.372]	-2.423*** [0.756]	0.425** [0.174]	0.435 [0.310]	0.903*** [0.213]	0.978** [0.398]	-0.646 [0.820]	-4.243** [1.585]	0.403 [0.268]	0.458 [0.434]	0.349*** [0.115]	0.118 [0.215]
Public banks	1.440** [0.625]	0.707 [1.268]	-0.828 [0.725]	-1.827 [1.250]	0.394 [0.948]	0.030 [1.694]	1.254 [1.624]	0.905 [3.107]	0.306 [0.525]	1.240 [0.852]	0.254 [0.334]	-0.162 [0.602]
Constant	-0.087 [0.364]	0.631 [0.741]	-1.217*** [0.155]	-1.388*** [0.265]	1.849*** [0.153]	1.957*** [0.282]	0.607 [0.627]	1.436 [1.233]	-0.009 [0.243]	-1.309*** [0.400]	-0.129 [0.090]	-0.458*** [0.164]
Observations	189	188	711	693	446	431	51	50	286	282	1,688	1,649
R-squared	0.306	0.389	0.282	0.389	0.398	0.232	0.134	0.431	0.339	0.296	0.336	0.290

Notes: The table presents the estimates of cross-sectional regressions of the impact of financial sector policies on the excess returns of banks on announcement days (n=0) and three days after the announcement (n=3). Excess returns are calculated as the bank stock returns during the month minus the returns of the domestic stock market index. All specifications include region fixed effects. Standard errors are clustered at the country level.

**Table 6. Heterogeneity in the impact of policy initiatives (developed vs developing countries)**

n =	Liquidity Support		Prudential Meas.		Borrower Assist.		Asset Purchases		Policy Rates		All announcements	
	0	3	0	3	0	3	0	3	0	3	0	3
<b>Developed Countries</b>												
Liquidity risk	0.324	1.431	0.025	0.146	0.530**	0.878**	0.422	1.928*	-0.396	5.330**	0.252*	0.731***
	[0.482]	[0.924]	[0.222]	[0.378]	[0.207]	[0.375]	[0.532]	[1.077]	[1.246]	[2.291]	[0.142]	[0.257]
Oil exposure	-0.187	0.294	-0.089	0.407	0.115	-0.313	-1.199	-1.634	-0.078	-8.749**	-0.034	0.065
	[0.673]	[1.291]	[0.207]	[0.356]	[0.213]	[0.406]	[1.088]	[2.212]	[2.211]	[4.065]	[0.146]	[0.271]
Size	-0.785	-3.446***	0.563***	0.702**	0.971***	1.161***	-1.074	-4.299**	2.043*	-0.305	0.635***	0.628**
	[0.527]	[1.011]	[0.185]	[0.329]	[0.220]	[0.407]	[0.944]	[1.931]	[1.067]	[1.961]	[0.134]	[0.251]
Public banks	2.072	2.865	-1.632*	-3.029**	0.368	0.075	1.745	-0.828	-0.484	19.139*	-0.744	-2.078**
	[1.657]	[3.178]	[0.863]	[1.488]	[0.967]	[1.702]	[2.196]	[4.454]	[4.966]	[9.131]	[0.581]	[1.047]
Constant	0.611	2.300**	-1.386***	-1.550***	2.060***	2.182***	1.137	1.447	-0.060	-4.725	-0.059	-0.396**
	[0.580]	[1.113]	[0.173]	[0.294]	[0.157]	[0.283]	[0.765]	[1.603]	[1.677]	[3.084]	[0.108]	[0.195]
Observations	44	44	643	625	403	391	39	38	25	25	1,156	1,125
R-squared	0.318	0.459	0.269	0.398	0.387	0.219	0.133	0.459	0.552	0.602	0.408	0.347
<b>Developing Countries</b>												
Liquidity risk	1.067	3.310**	0.279	-0.511	0.640	-0.785	-4.422	-2.190	0.545*	0.653	0.529**	0.831*
	[0.804]	[1.649]	[0.517]	[1.014]	[0.722]	[1.400]	[2.389]	[3.013]	[0.288]	[0.436]	[0.244]	[0.466]
Oil exposure	-0.226	-1.313**	-1.121**	-1.146	-0.434	2.584*	0.953	1.681	-0.576***	-0.607**	-0.435***	-0.621**
	[0.308]	[0.625]	[0.497]	[0.976]	[0.614]	[1.413]	[1.164]	[1.468]	[0.179]	[0.269]	[0.145]	[0.277]
Size	-0.961*	-1.534	-0.801*	-2.023**	-1.261	-2.831	3.115	-0.388	0.096	-0.256	-0.435*	-1.166***
	[0.510]	[1.041]	[0.460]	[0.903]	[0.900]	[1.793]	[2.266]	[2.859]	[0.292]	[0.434]	[0.223]	[0.422]
Public banks	1.413**	0.340	0.190	0.190			3.868	6.300*	0.514	1.638**	0.924**	1.091
	[0.697]	[1.414]	[1.104]	[2.164]			[2.254]	[2.844]	[0.525]	[0.780]	[0.375]	[0.709]
Constant	-0.284	0.233	0.974	0.304	0.415	0.269	-5.925*	-3.249	-0.084	-1.104***	-0.047	-0.377
	[0.446]	[0.909]	[0.605]	[1.186]	[0.389]	[0.729]	[2.971]	[3.748]	[0.250]	[0.378]	[0.197]	[0.375]
Observations	145	144	68	68	43	40	12	12	261	257	532	524
R-squared	0.306	0.393	0.403	0.372	0.348	0.488	0.593	0.728	0.273	0.297	0.249	0.236

Notes: The table presents the estimates of cross-sectional regressions of the impact of financial sector policies on the excess returns of banks on announcement days (n=0) and three days after the announcement (n=3). Excess returns are calculated as the bank stock returns during the month minus the returns of the domestic stock market index. All specifications include region fixed effects. Standard errors are clustered at the country level.

## Appendix

**Table A1. Panel A. Number of banks and non-bank financial companies in developing countries**

Region	Country	Number of banks	weights within region	Number of non-banks	Weights within region
Africa	Nigeria	10	0.47	23	0.24
	South-Africa	3	0.53	37	0.76
China	China	33	0.75	67	0.54
	Hong-Kong	6	0.25	121	0.46
EAP	Indonesia	39	0.22	49	0.28
	Malaysia	10	0.30	22	0.21
	Philippines	13	0.11	11	0.06
	Thailand	9	0.25	49	0.35
	Vietnam	13	0.13	34	0.11
ECA	Bulgaria	2	0.00	9	0.01
	Croatia	5	0.03	1	0.00
	Poland	12	0.31	65	0.51
	Romania	3	0.03	4	0.00
	Russia	10	0.25	11	0.36
	Turkey	10	0.38	53	0.12
India	India	32	1.00	298	1.00
LAC	Argentina	6	0.04	2	0.01
	Brazil	11	0.36	12	0.35
	Chile	5	0.21	5	0.13
	Colombia	2	0.12	3	0.25
	Mexico	4	0.17	12	0.23
	Peru	4	0.10	3	0.04
MENA	Egypt	9	0.02	20	0.05
	Israel	8	0.18	37	0.61
	Kuwait	10	0.10	39	0.05
	Morocco	6	0.03	6	0.09
	Pakistan	21	0.05	58	0.03
	Qatar	9	0.16	9	0.05
	Saudi-Arabia	11	0.23	32	0.09
	UAE	10	0.23	10	0.03
<i>Total Developing countries</i>		326		1102	

Notes: The table lists the number of banks and non-bank financial companies by country, along with the sum of their weights (based on assets) within each region.

**Table A1. Panel B. Number of banks and non-bank financial companies in high-income countries**

Region	Country	Number of banks	Bank weights within region	Number of non-banks	Non-bank weights within region
High Income	Australia	7	0.05	76	0.02
	Austria	5	0.03	5	0.00
	Belgium	0	-	8	0.00
	Canada	9	0.04	80	0.05
	Denmark	20	0.01	9	0.00
	Finland	3	0.00	12	0.01
	France	12	0.05	27	0.03
	Germany	5	0.00	74	0.10
	Ireland	2	0.00	1	0.00
	Italy	14	0.02	31	0.01
	Japan	70	0.04	18	0.12
	Luxembourg	0	-	3	0.00
	New Zealand	0	-	4	0.00
	Netherlands	2	0.01	5	0.01
	Norway	34	0.00	10	0.00
	Portugal	1	0.00	1	0.00
	Singapore	2	0.01	15	0.00
	South-Korea	3	0.00	58	0.03
	Spain	8	0.03	6	0.00
	Sweden	5	0.01	21	0.00
Switzerland	13	0.01	32	0.03	
UK	11	0.10	96	0.02	
US	344	0.59	453	0.56	
<i>Total high-income countries</i>		<i>570</i>		<i>1045</i>	

Notes: The table lists the number of banks and non-bank financial companies by country, along with the sum of their weights (based on assets) within each region.



**Table A2. Summary statistics of banks by region**

Region	Variable	Mean	SD	P25	P50	P75	Obs
AFRICA	Stock returns	-0.002	0.003	-0.004	-0.003	-0.001	13
	Public-owned bank	0.08	0.28	0.00	0.00	0.00	13
	Liquidity ratio	0.46	1.08	0.09	0.18	0.24	13
	Assets (IHS)	22.9	1.9	21.8	23.1	24.2	13
	Tier 1 capital ratio	23.4	8.2	19.6	21.8	22.9	6
	Total capital ratio	25.7	7.3	23.0	24.0	26.2	6
	Exposure to oil sector	-0.21	0.43	-0.44	-0.39	0.13	13
CHINA	Stock returns	-0.002	0.001	-0.002	-0.002	-0.001	39
	Public-owned bank	0.10	0.31	0.00	0.00	0.00	39
	Liquidity ratio	0.12	0.02	0.10	0.11	0.14	38
	Assets (IHS)	26.9	1.7	25.3	26.9	28.3	38
	Tier 1 capital ratio	11.2	1.4	10.1	10.8	12.3	32
	Total capital ratio	14.1	1.4	12.7	14.0	15.4	32
	Exposure to oil sector	-0.11	0.36	-0.27	-0.08	0.04	39
EAP	Stock returns	-0.003	0.005	-0.005	-0.003	-0.002	84
	Public-owned bank	0.32	0.47	0.00	0.00	1.00	84
	Liquidity ratio	0.10	0.05	0.06	0.10	0.13	84
	Assets (IHS)	23.6	1.8	22.3	24.0	25.1	84
	Tier 1 capital ratio	19.3	9.7	13.7	16.3	20.7	63
	Total capital ratio	21.7	9.3	16.6	19.0	22.7	70
	Exposure to oil sector	-0.02	0.62	-0.41	-0.13	0.13	84
ECA	Stock returns	-0.003	0.003	-0.004	-0.003	-0.002	42
	Public-owned bank	0.22	0.42	0.00	0.00	0.00	41
	Liquidity ratio	0.12	0.09	0.06	0.11	0.15	37
	Assets (IHS)	24.1	1.5	23.2	24.4	25.4	37
	Tier 1 capital ratio	12.9	3.6	10.7	13.2	15.5	27
	Total capital ratio	15.8	4.0	14.6	16.2	17.5	27
	Exposure to oil sector	0.09	0.68	-0.10	0.11	0.31	42
INDIA	Stock returns	-0.006	0.003	-0.008	-0.006	-0.004	32
	Public-owned bank	0.53	0.51	0.00	1.00	1.00	32
	Liquidity ratio	0.07	0.02	0.06	0.07	0.08	32
	Assets (IHS)	24.8	1.3	23.9	24.9	25.8	32
	Tier 1 capital ratio	12.2	3.7	9.9	11.6	14.4	32
	Total capital ratio	14.3	3.5	12.0	13.8	16.0	32
	Exposure to oil sector	-0.04	0.43	-0.35	-0.07	0.28	32

Notes: The table presents the summary statistics of the 896 banks in the sample. Stock returns for each bank are averaged over the period January 1, 2020 to May 5, 2020. Assets, liquidity, capital ratios and exposure to the oil sector are calculated using data prior to COVID-19 (from 2019Q1 to 2019Q4). Assets correspond to the average total assets of a bank over time and are measured using the inverse hyperbolic sine (IHS) function. We define liquidity as the average ratio of cash and equivalents kept by a bank over its total assets. Tier 1 capital and Total capital ratios are the average regulatory ratios reported by banks. To measure the degree of exposure of a bank to the oil sector, we run an OLS regression of the bank's daily stock returns as a function of a constant term, the market return where the bank is located and the returns of oil prices for the period May 1, 2018 to December 31, 2019. The exposure to the oil sector of each bank is given by the coefficient of the return of oil prices in this regression.

**Table A2. (Cont'd) Summary statistics of banks by region**

Region	Variable	Mean	SD	P25	P50	P75	Obs
LAC	Stock returns	-0.004	0.003	-0.006	-0.004	-0.002	32
	Public-owned bank	0.08	0.28	0.00	0.00	0.00	24
	Liquidity ratio	0.28	0.81	0.05	0.11	0.17	24
	Assets (IHS)	24.4	1.3	23.4	24.3	25.4	24
	Tier 1 capital ratio	13.4	3.3	10.4	12.8	16.0	14
	Total capital ratio	15.4	2.9	13.1	14.3	16.0	17
	Exposure to oil sector	0.15	0.48	-0.14	0.26	0.46	32
MENA	Stock returns	-0.002	0.002	-0.004	-0.003	-0.001	84
	Public-owned bank	0.36	0.48	0.00	0.00	1.00	84
	Liquidity ratio	0.15	0.45	0.07	0.09	0.13	79
	Assets (IHS)	24.1	1.4	23.0	24.1	25.2	79
	Tier 1 capital ratio	15.0	3.5	11.9	15.5	17.8	61
	Total capital ratio	17.1	3.0	14.7	17.3	18.8	61
	Exposure to oil sector	0.03	0.58	-0.15	0.11	0.24	84
High-Income	Stock returns	-0.004	0.003	-0.006	-0.004	-0.002	570
	Public-owned bank	0.02	0.15	0.00	0.00	0.00	563
	Liquidity ratio	0.13	0.51	0.01	0.03	0.09	448
	Assets (IHS)	23.8	2.4	21.8	23.3	25.0	460
	Tier 1 capital ratio	14.2	5.2	12.0	13.2	15.3	348
	Total capital ratio	15.1	5.6	12.7	14.2	16.5	406
	Exposure to oil sector	0.10	1.49	-0.18	0.03	0.22	568

Notes: The table presents the summary statistics of the 896 banks in the sample. Stock returns for each bank are averaged over the period January 1, 2020 to May 5, 2020. Assets, liquidity, capital ratios and exposure to the oil sector are calculated using data prior to COVID-19 (from 2019Q1 to 2019Q4). Assets correspond to the average total assets of a bank over time and are measured using the inverse hyperbolic sine (IHS) function. We define liquidity as the average ratio of cash and equivalents kept by a bank over its total assets. Tier 1 capital and Total capital ratios are the average regulatory ratios reported by banks. To measure the degree of exposure of a bank to the oil sector, we run an OLS regression of the bank's daily stock returns as a function of a constant term, the market return where the bank is located and the returns of oil prices for the period May 1, 2018 to December 31, 2019. The exposure to the oil sector of each bank is given by the coefficient of the return of oil prices in this regression.

**Table A3. Risk factors during the COVID-19 crisis (dependent variable: bank excess returns)**

	January			February			March			April		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Liquidity risk	-0.745 [0.646]	-0.745 [0.652]	-0.650 [0.586]	-0.128 [0.494]	-0.103 [0.504]	-0.380 [0.364]	<b>-3.030***</b> <b>[1.022]</b>	<b>-3.027***</b> <b>[1.018]</b>	<b>-3.949***</b> <b>[1.166]</b>	-0.483 [0.474]	-0.453 [0.473]	-0.526 [0.422]
Oil exposure	0.404** [0.200]	0.404** [0.200]	0.202 [0.167]	0.124 [0.410]	0.136 [0.415]	0.055 [0.419]	<b>-1.986**</b> <b>[0.755]</b>	<b>-1.984**</b> <b>[0.749]</b>	<b>-2.366***</b> <b>[0.576]</b>	-0.299 [0.451]	-0.285 [0.453]	0.090 [0.629]
Size	-0.380 [0.250]	-0.379 [0.259]	-0.817** [0.333]	-1.075*** [0.292]	-0.994*** [0.335]	-1.632** [0.662]	<b>-2.039**</b> <b>[0.800]</b>	<b>-2.028***</b> <b>[0.752]</b>	<b>-2.373**</b> <b>[0.992]</b>	1.091 [0.717]	1.184 [0.713]	2.069 [1.326]
Public banks		-0.003 [1.185]	0.488 [1.216]		-1.515 [2.084]	-0.906 [2.220]		-0.203 [2.849]	0.392 [2.986]		-1.729 [1.421]	-2.138 [1.424]
Total capital			0.976** [0.469]			1.318*** [0.388]			-1.576 [1.516]			0.093 [0.286]
Constant	-1.857*** [0.581]	-1.857*** [0.612]	-2.371*** [0.616]	0.467 [0.504]	0.600 [0.553]	-0.005 [0.460]	-5.475*** [1.551]	-5.457*** [1.611]	-5.809*** [1.638]	-4.905*** [0.474]	-4.753*** [0.488]	-4.576*** [0.408]
Observations	742	742	644	743	743	644	743	743	644	743	743	644
R-squared	0.130	0.130	0.162	0.107	0.110	0.187	0.177	0.177	0.220	0.038	0.040	0.057
Fixed Effects	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region
Cluster	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Notes: Cross sectional regressions of monthly excess returns. Excess returns are calculated as the bank stock returns during the month minus the returns of the domestic stock market index. All specifications include region fixed effects. Standard errors are clustered at the country level.

**Table A4. Risk factors during the COVID-19 crisis (abnormal returns in dollars relative to global market index)**

	January			February			March			April		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Liquidity risk	-0.486	-0.479	-0.361	0.408	0.440	0.187	<b>-2.105*</b>	<b>-2.089*</b>	<b>-3.296***</b>	0.120	0.136	0.325
	[0.613]	[0.617]	[0.569]	[0.556]	[0.565]	[0.710]	<b>[1.188]</b>	<b>[1.177]</b>	<b>[1.161]</b>	[0.600]	[0.601]	[0.508]
Oil exposure	0.770**	0.774**	0.602	0.708	0.723	0.904*	<b>-1.094</b>	<b>-1.087</b>	<b>-0.880</b>	-0.322	-0.315	-0.220
	[0.337]	[0.339]	[0.419]	[0.516]	[0.519]	[0.501]	<b>[1.089]</b>	<b>[1.090]</b>	<b>[0.784]</b>	[0.469]	[0.471]	[0.498]
Size	-0.238	-0.214	-0.553	0.233	0.340	0.481	<b>0.128</b>	<b>0.181</b>	<b>0.985</b>	-0.858	-0.805	-1.245
	[0.341]	[0.335]	[0.405]	[0.326]	[0.321]	[0.383]	<b>[0.971]</b>	<b>[0.962]</b>	<b>[1.632]</b>	[0.715]	[0.744]	[0.799]
Public banks		-0.424	-0.006		-1.907	-1.802		-0.946	-1.845		-0.954	0.161
		[1.317]	[1.361]		[2.183]	[2.259]		[2.405]	[2.511]		[1.313]	[1.160]
Total capital			0.530			1.307*			-2.493			-0.157
			[0.435]			[0.766]			[1.562]			[0.404]
Constant	-0.553	-0.515	-1.032*	-1.023	-0.854	-0.983	-8.098***	-8.014***	-7.161***	-2.642***	-2.557***	-3.249***
	[0.534]	[0.560]	[0.563]	[0.663]	[0.698]	[0.708]	[1.754]	[1.820]	[1.558]	[0.459]	[0.506]	[0.382]
Observations	737	737	643	738	738	643	738	738	643	738	738	643
R-squared	0.172	0.172	0.207	0.189	0.193	0.240	0.245	0.245	0.319	0.132	0.132	0.165
Fixed Effects	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region
Cluster	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Notes: Cross sectional regressions of monthly abnormal returns. Abnormal returns are calculated in dollars as the difference between realized returns and the expected returns implied by a market model based on a global market index. All specifications include region fixed effects. Standard errors are clustered at the country level.

**Table A5. Risk factors during the COVID-19 crisis (based on Fama–French three-factor model)**

	January			February			March			April		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Liquidity risk	-0.678 [0.750]	-0.687 [0.748]	-0.233 [0.687]	0.114 [0.849]	0.130 [0.855]	0.040 [0.791]	<b>-2.471</b> <b>[1.645]</b>	<b>-2.495</b> <b>[1.644]</b>	<b>-3.974***</b> <b>[1.221]</b>	0.154 [0.617]	0.171 [0.619]	0.345 [0.501]
Oil exposure	0.747 [0.561]	0.743 [0.563]	0.480 [0.654]	0.557 [0.683]	0.564 [0.686]	0.838 [0.696]	<b>-2.046</b> <b>[1.226]</b>	<b>-2.057*</b> <b>[1.224]</b>	<b>-1.349</b> <b>[0.976]</b>	-0.199 [0.597]	-0.191 [0.596]	-0.313 [0.630]
Size	0.866 [0.586]	0.839 [0.595]	1.215** [0.508]	0.413 [0.491]	0.465 [0.502]	0.917** [0.434]	<b>1.276</b> <b>[1.147]</b>	<b>1.199</b> <b>[1.133]</b>	<b>3.290*</b> <b>[1.923]</b>	0.213 [0.639]	0.268 [0.649]	0.026 [0.861]
Public banks		0.493 [1.285]	0.579 [1.361]		-0.934 [1.789]	-0.913 [1.789]		1.381 [3.753]	0.163 [4.049]		-0.991 [1.413]	-0.217 [1.230]
Total capital			0.953 [0.617]			1.538* [0.805]			-1.953 [1.367]			0.217 [0.429]
Constant	1.725** [0.666]	1.682** [0.704]	1.495** [0.628]	0.155 [0.737]	0.238 [0.767]	0.143 [0.729]	-1.871 [1.904]	-1.993 [2.014]	-0.271 [1.490]	-4.048*** [0.510]	-3.960*** [0.562]	-4.505*** [0.401]
Observations	737	737	643	738	738	643	738	738	643	738	738	643
R-squared	0.166	0.166	0.172	0.145	0.145	0.161	0.202	0.202	0.273	0.085	0.086	0.110
Fixed Effects	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region
Cluster	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Notes: Cross sectional regressions of monthly abnormal returns. Abnormal returns are the difference between realized returns and the expected returns implied by the Fama–French three-factor model. All specifications include region fixed effects. Standard errors are clustered at the country level.

**Table A6. Policy announcements in developed and developing countries**

<b>Policy category</b>	<b>Developed Countries</b>		<b>Developing Countries</b>	
	<b>(days with policy announcements = 160)</b>		<b>(days with policy announcements = 115)</b>	
	Announcements by category	Single policy announcements	Announcements by category	Single policy announcements
Liquidity	40	14	43	18
Prudential	99	47	42	18
Borrower Support	57	11	32	16
Asset Purchases	22	17	8	2
Policy Rates	10	6	36	28
<i>Total policies</i>	228	95	161	82
<b>Policy categories announced in the same day</b>				
Liquidity + Prudential	13		7	
Liquidity + Borrower Support	9		2	
Liquidity + Prudential + Borrower Support	1		5	
Liquidity + Policy Rates	2		3	
Liquidity + Asset Purchases	0		3	
Prudential + Borrower Support	35		6	
Prudential + Policy Rates	0		2	
Prudential + Liquidity + Asset Purchases	1		1	
Borrower Support + Liquidity + Policy Rates	0		1	
Borrower Support + Asset Purchases + Policy Rates	1		0	
Policy Rates + Asset Purchases	1		0	
Policy Rates + Liquidity + Prudential	0		1	
Asset Purchases + Prudential	2		0	

Notes: Data obtained from the World Bank (World Bank, 2020) covering the period February 1 to April 17 2020.

**Table A7. Impact of unexpected monetary policy rate announcements**

	(1)	(2)	(3)	(4)
n =	0	3	0	3
Liquidity risk	0.284 (0.415)	1.502* (0.887)	0.203 (0.477)	1.348 (1.505)
Oil exposure	-0.752* (0.388)	-1.741** (0.802)	-0.859** (0.273)	-1.983** (0.820)
Size	0.474 (0.394)	1.055 (0.810)	0.299 (0.434)	0.675 (0.768)
Public banks			1.095 (0.982)	2.401 (1.443)
Constant	0.542* (0.323)	-0.691 (0.666)	0.322 (0.339)	-1.168*** (0.214)
Observations	87	86	87	86
R-squared	0.266	0.395	0.283	0.412

Notes: The table presents the estimates of cross-sectional regressions of the impact of financial sector policies on the excess returns of banks on announcement days (n=0) and three days after the announcement (n=3). Excess returns are calculated as the bank stock returns during the month minus the returns of the domestic stock market index. All specifications include region fixed effects. Standard errors are clustered at the country level.