BANKING SECTOR PERFORMANCE DURING THE COVID-19 CRISIS

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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 mod- erated 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.

Keywords: *Bank stock returns, government announcements, liquidity premium, COVID-19 pandemic period.*

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). 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 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 49 countries covering 874 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.[1] 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 liquiditybuffers 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 2nd to April 17th. The data was compiled and made publicly available by the World Bank (World Bank, 2020). My 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 our categories. Liquidity supports 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 includes 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). My empirical methodology consists of estimating bank's abnormal returns around the announcement day. My results can be summarized as follows:

- Liquidity support initiatives seem to have a farmable 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 onmarkets, as evidenced by bank stocks over performance 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 fromthe 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 policyrate 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 My sample to country-dates where only policies ofa particular category were announced. Importantly, almost half of my 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 forevery day during this period. My 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 theanticipated by market analysts.

My paper is related to a growing literature that studies the economic impact of the pandemic using stock market data (e.g., Gormsen & Koijen, 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. The documented increases in bank's 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. Forexample, 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 developedcountries.[3]

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 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 my 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 my knowledge, our paper represents the first global analysis examining the market response to financial policy measures during the pandemic.

2. Data

The data from Definitive on all publicly traded banks and non-bank financial companies across 49 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. The 4,871 stocks in the data, we drop 603 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 1,175 stocks that traded less than 33% of the business days in each country throughout the sample period. Finally, we drop from the dataset 219 banks that are owned by corporate groups whose core business is different from banking.

My final sample comprises 3,043 firms, of which 896 are commercial banks and 2,374 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 my sample.

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 25th percentile holding as little as 2 percent of cash and equivalents relative to their total assets.[4]

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 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 My measure of exposure of banks to the oil sector, there is large heterogeneity around this measure, with the returns of banks in the 75th percentile experiencing a correlation with oil price returns of 0.23, compared to a correlation of -0.22 among banks in the 25th percentile.

3. Banks Risk Premium during the Crisis

We begin my analysis by comparing the stock price returns of banks with their overall domestic markets during the first months of the year. 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 ofthe 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. 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.

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

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

Where $ARet_{b,}$ are the abnormal returns for bank b at time t, $R_{b,}$ is the realized stock return of the bank, and RM_t is the market return. For each bank, Alfan and beta are the

b

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. 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 $ARe_{,}$ is the cumulative abnormal return of bank b from country c from montht-1 to month t. We refer to liquidity risk k_b as the bank illiquidity or liquidity risk interchangeably. To calculate this variable, we multiply the 2019 average cash holdings of bank b by -1. Ol_b is the measure of exposure for each bank to the oil sector as explained above. $S\mathbb{l}ze_b$ corresponds to the ex-ante total assets of a bank, measured in IHS. Public $bank_b$ is an indicator variable that equals one for government-owned banks and zero otherwise. The coefficients are a set of region fixed effects and $u_{b,,}$ is an error term clustered at the country level.

My final specification is as follows:

$ARet^{n} = \alpha_0 + \alpha_1$Liquidity $risk_b + \alpha_2 Ol\ exposure_b + \alpha_3 S\mathbb{l}ze_b + \alpha_4 Publ\mathbb{l}c\ bank_b$
$_{b,c,t}$
$+\alpha_5 Capl\mathbb{l}ta + \gamma_r + u_{b,}$

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, withex-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.[6] 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.
The decline in abnormal returns of less-liquid and more oil-exposed banks remained unchanged from March to April. 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., $R_{b,} - RM_t$).

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 encMyaged banks to continue providing credit, in some cases by incentivizing them to draw down their buffers.[7] While this time banks appear to be part of the solution to the crisis, the banking sector has also been hit hard by a rapid increase in the amountof 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

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 madepublicly 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 of the announcement which restricts My 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.

- **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 slowingdown the decline in bank's 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** includes 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 replenish able working capital financing. Other measures include enhancement of deposit protection schemes and simplified programs of loan restructuring.
- **Monetary Policy** is interest rate decisions (e.g., benchmark rate, repo rates, etc.), central bankpurchases 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 categoryinto Policy Rate announcements and Asset Purchases (both public and private bond buying programs and purchases of asset-backed securities).

My final sample contains policies in 17 developed and 28 developing countries, for which we have stock market and policy data. Some European countries such as, Austria, Finland, and Netherlands, did not have domestic financial policy initiatives. We include banksof 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. 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 byborrower support, liquidity provision measures, monetary policy and asset purchases (23%, 21%, 12% and 8% respectively).[8] However, the type of policies adopted differed substantially across countries. 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.

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 my 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 my sample, 40 countries had introduced prudential actions, typically through a temporary relaxation of certain key regulatory and supervisory requirements.

5. 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 responseto different types of policies.[9] For example, the cross-sectional analysis allows us to answer whether a specific type of government support measure favored a particular group of banks. My 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 suchas 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 ($ARet^n_{b,t}$).

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

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

where $ARet^n_{b,c,t}$ represents the abnormal return of bank b located in country c in day t, measured over the [-1, n] window (in days).[10] The covariates are bank observables which include, bank illiquidity, oil exposure, and the indicator that captures whether the bank has state

ownership.
Finally, $_c$ and γ_t are country and announcement date fixed effects. Standard errors are clustered at the country level.

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

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 My sample to country-dates where only policies of a particular category were announced, and report results for this restricted sample.[11]

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 effectwith 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 bemore 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).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.

6. 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.[12] The results are displayed 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 My 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 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. 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.[13] 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 in the restricted sample, abnormal returns are small and statistically indistinguishable from zero.

Liquidity Support

Announcements of liquidity support are strongly associated with a reduction in the liquidity premium. That is, stocks of less liquid banks over perform 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 day window).[14] 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.

i. 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, my evidence indicates that the effect of prudential measures is undistinguishable across banks, irrespective of their liquidity ratios and exposure to the oil sector.[15] My 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.

ii. 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 resects 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.

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.[18] 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.

Announcement concerning asset purchases were also followed by increases in the abnormal returns of illiquid banks, albeit with marginal statistical significance in the restrictedsample.[19] 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 My sample to days with monetary policy surprises. That is, werestrict My sample to days when the monetary authority made policy rate announcements afteremergency meetings, or when the domestic policy rate cut was larger than the expected by market analysts.[20] 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.

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

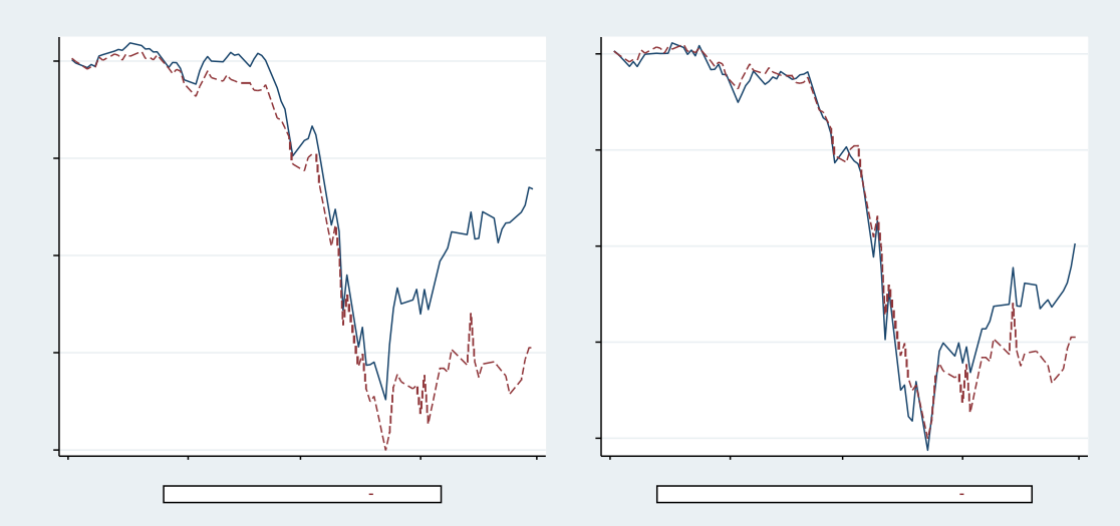
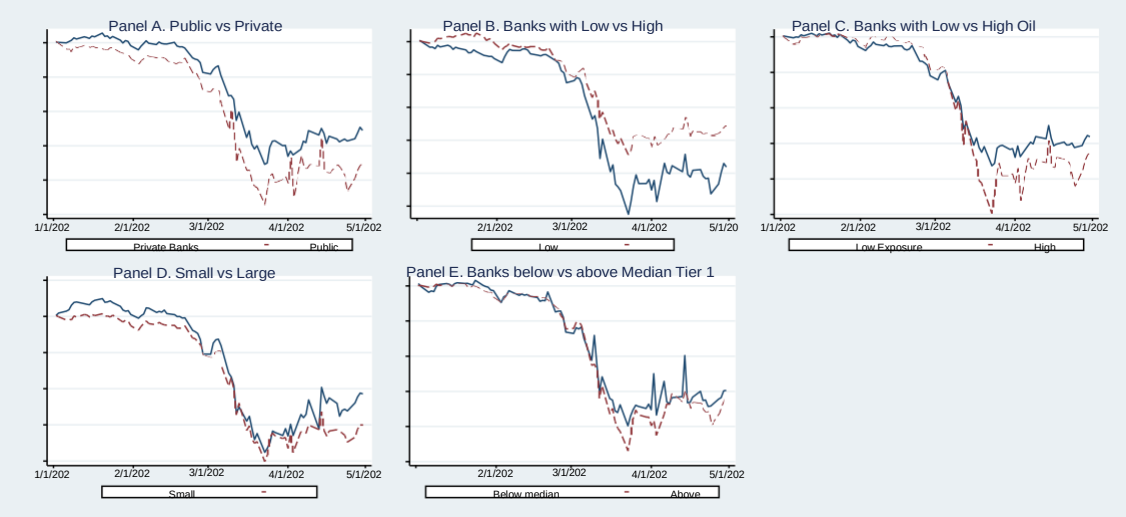


Figure 2 : Average Stock Returns by Bank Characteristics



7. Conclusion

The spread of COVID-19 represents an unpresented global shock, with the disease itselfand mitigation efforts –such as social distancing measures and partial and national lockdowns.

Measures– both have 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. My 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.

My results suggest that the adverse impact of the COVID-19 shock on banks was much more pronounced and long-lasting than on the corporate 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. My 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. 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, my 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.

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