

WORKING
PAPERS IN
RESPONSIBLE
BANKING &
FINANCE

**Effect of a Funding-for-
Lending Program: Evidence
from the Bank of Japan's
COVID-19 Operation**

*By Hiroshi Gunji, Arito Ono,
Masato Shizume, Hirofumi
Uchida, Yukihiro Yasuda*

Abstract: In this study, we examine the effect of a 2021 policy change by the Bank of Japan during COVID-19 that gave an incentive to banks to use non-guaranteed preferential loans over guaranteed loans. By assessing the causal effect of this change on banks' loan composition, we find that the policy change decreased the ratio of guaranteed loans to total loans. We also find that this decline was driven by a reduction in guaranteed loans, not by an increase in non-guaranteed loans, suggesting that the policy effectively reduced banks' reliance on government guarantees.

WP N° 26-015

2nd Quarter 2026



Effect of a Funding-for-Lending Program:
Evidence from the Bank of Japan's COVID-19 Operation *

Hiroshi Gunji[†], Arito Ono[‡], Masato Shizume[§]

Hirofumi Uchida^{**}, Yukihiro Yasuda^{††}

February 2026

Abstract

In this study, we examine the effect of a 2021 policy change by the Bank of Japan during COVID-19 that gave an incentive to banks to use non-guaranteed preferential loans over guaranteed loans. By assessing the causal effect of this change on banks' loan composition, we find that the policy change decreased the ratio of guaranteed loans to total loans. We also find that this decline was driven by a reduction in guaranteed loans, not by an increase in non-guaranteed loans, suggesting that the policy effectively reduced banks' reliance on government guarantees.

Keywords: COVID operation, funding-for-lending program, central banks, COVID-19

JEL Classification code: E58, G21

* This study is financially supported by JSPS KAKENHI Grant Numbers 20H01517, 22H00860 and 24K04946.

[†] Daito Bunka University. Email: hgunji@ic.daito.ac.jp

[‡] Chuo University. Email: a-ono@tamacc.chuo-u.ac.jp

[§] Waseda University. Email: masato.shizume@waseda.jp

^{**} Corresponding author. Graduate School of Business Administration, Kobe University, 2-1 Rokkodai, Nada, Kobe, Japan. Email: uchida@b.kobe-u.ac.jp

^{††} Hitotsubashi University. Email: y.yasuda@r.hit-u.ac.jp

1. Introduction

In this study, we examine the effects of a funding-for-lending program (FFL) through which a central bank provides low-cost funding (i.e., reserves) to private banks to encourage their lending—often to specific types of borrowers such as small- and medium-sized enterprises (SMEs). Recently, FFLs have become an important policy tool for many central banks, including the Bank of England’s Funding for Lending Scheme, the European Central Bank’s Targeted Long-term Refinancing Operations, and the Federal Reserve’s Term Auction Facility.

However, identifying the causal effect of an FFL is empirically challenging, because a simple regression of bank loans on the amount of funds provided through the FFL may suffer from endogeneity concerns. Particularly, there is a serious concern about reverse causality, because the amount of funds provided through the FFL are often conditional on the amount of eligible loans that private banks have already extended.

In this study, we focus on the FFL by the Bank of Japan (BoJ)—the Special Funds-Supplying Operations to Facilitate Financing in Response to the Novel Coronavirus (hereafter called the COVID operation)—implemented from 2020 to 2023, and address the endogeneity concerns. The aim of this operation was to promote private banks’ lending to firms or households suffering from the COVID-19 pandemic. In this vein, the operation used two policy tools: (1) interest-free short-term loans to the banks and (2) preferential interest rates on the current account balances (CAB) that these banks held at the BoJ. To circumvent any endogeneity concerns, we exploit the BoJ’s institutional change on the second tool that was implemented in March 2021. This change promoted COVID-related loans by private banks that were not guaranteed by a public credit guarantee over guaranteed loans. We examine whether this exogenous shock affected banks’ loan composition.

In our analysis, we use bank-level panel data containing balance-sheet information as well as the aggregate amount of funds provided through the COVID operation. We find that the 2021 policy

change decreased the ratio of guaranteed loans to total loans. However, a further decomposition showed that this decrease was due to a decrease in the amount of guaranteed loans, rather than an increase in non-guaranteed loans. These findings indicate that the BoJ's policy change did affect private banks' behavior by reducing their reliance on guaranteed loans, but it might not have increased non-guaranteed COVID-related loans as intended.

The literature on FFL programs is growing (Berger et al., 2017; Afonso and Sousa-Leite, 2020; Albertazzi et al., 2021; Benetton and Fantino, 2021; Churm et al., 2021; Hirata et al., 2024; Matjaž, 2024), with some studies focusing on COVID-19-related programs such as the Paycheck Protection Program Liquidity Facility in the US (Anbil et al. 2023; Lopez and Spiegel 2023; Marsh and Sharma 2024) and the PMK70 program in Indonesia (Naiborhu and Ulfa 2023). Our study also focuses on a COVID-19-related FFL program in Japan and contributes to the literature in three ways. First, we provide new evidence on the BoJ's COVID operation by exploiting the unique feature of preferential interest rates on the CABs.⁷ Second, we are unique in focusing on the effect of the change in the preferential rates on the CAB on the *composition* of bank loans. Third, we complement the literature by focusing on the exogenous policy shock to private banks that serves as a strong identification strategy distinct from an instrumental variable or a difference-in-differences (DID) approach adopted in the abovementioned studies.

2. The COVID operation

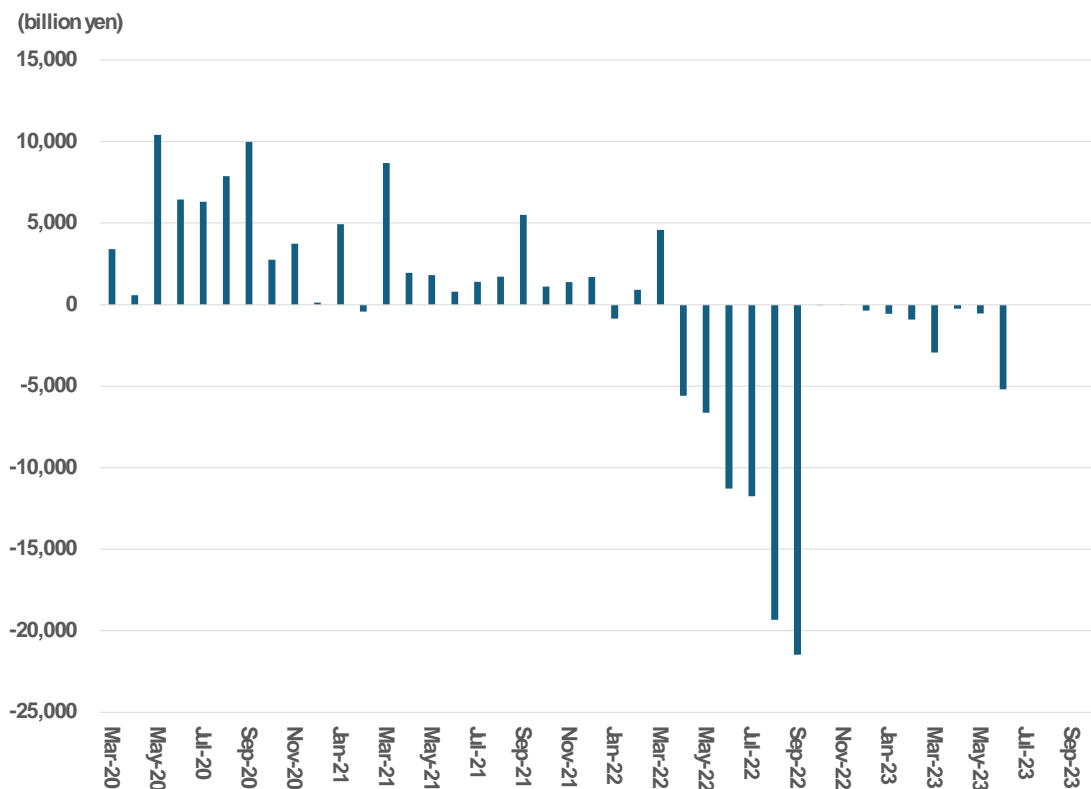
The BoJ's COVID operation employed two policy tools to encourage bank lending. The first

⁷ Matsumoto (2025) also examines the effect of the COVID-19 operation but focuses on its direct effect on private banks' lending.

was the provision of interest-free short-term funds to private banks that provided loans on “preferential” terms to firms (primarily SMEs) and households affected by the pandemic. Most of these loans were the so-called “zero-zero” loans (effectively zero-interest and no-collateral) with interest costs subsidized by local governments and credit guarantees provided by Credit Guarantee Corporations (CGCs), which are financially backed by central and local governments. Non-guaranteed bank loans were also eligible, provided that their lending terms were comparable to those applied to guaranteed loans.

Figure 1 shows the net change in the outstanding amount of the interest-rate free loans to private banks provided through the COVID operation. From March 2020 to March 2022, the changes were mostly positive, indicating that the BoJ provided funds to private banks. As the pandemic ceased, the BoJ started withdrawing the funds up to March 2023 when it terminated the operation.

Figure 1 Funds provided and withdrawn through the COVID operation



The maximum amount of the interest-free loans was set equal to private banks' outstanding preferential loans minus their existing interest-free loans from the BoJ. This design tightly linked BoJ's funding to banks' lending, making it difficult to identify the causal effect of the operation on banks' lending.

The second tool of the COVID operation was preferential interest rates on CABs held by private banks at the BoJ. Before the introduction of the operation, the BoJ had already implemented the negative interest rate policy (introduced in 2016) under which CABs were divided into three tiers: the Policy-Rate Balance (-0.1% interest rate), the Macro Add-on Balance (0%), and the Basic Balance (+0.1%). In March 2020, when launching the COVID operation, the BoJ allowed banks to include an

amount equivalent to twice their borrowing under the operation in the Macro Add-on Balance, thereby exempting those funds from the negative interest rate. In April 2020, while maintaining this framework, the BoJ introduced an additional incentive by applying a positive interest rate of +0.1% to the portion of CABs corresponding to the amount of borrowing through the operation.

In March 2021, the BoJ revised this scheme to incentivize private banks to provide *non-guaranteed* over guaranteed preferential loans. The new scheme applied an interest rate of 0.2% to CABs equivalent to the amount of non-guaranteed preferential loans, while the 0.1% rate remained applicable for guaranteed loans. We exploit this exogenous change to identify the causal effect.

3. Data and method

3.1. Data

We collected semiannual financial statement data for city and regional banks that participated in the BoJ's COVID operation from the website of the Japanese Bankers Association. The bank-level data on loans guaranteed by CGCs were obtained from the website of the Small and Medium Enterprise Agency. Finally, we obtained data on the aggregate amount of the BoJ's COVID operation from the BoJ's website.⁸

The sample period is from late 2018 (end of September) to the end of fiscal year 2022 (end of March 2023) that covers three distinct periods: (i) before the introduction of the COVID operation; (ii) after the introduction but before the change in the CAB interest rate scheme; and (iii) after the change. Merging all data at the bank level, we construct a panel of 1,027 bank-semiannual observations (with an average of 108 banks per period).

⁸ The data on the amount of funds provided to *individual* banks through the operation are not publicly available.

3.2. Method and variables

We estimate the following regression model:

$$Y_{it} = \alpha + \beta_1 \text{After}_t + \beta_2 \text{BOJ_operation}_t + \beta_3 \text{BOJ_operation}_t \times \text{After}_t + \beta_4 \text{Asset}_{it-1} + \gamma_i + \delta_{kt} + \varepsilon_{it}, \quad (1)$$

where Y_{it} represents alternative variables indicating bank i 's loan composition at time t : CG_ratio_{it} and d_CG_share_{it} that are respectively the ratio of CGC-guaranteed loans to total loans and its annual change; and CG_{it} , Non_CG_{it} , and Total Loans_{it} that are respectively the amounts of guaranteed, non-guaranteed, and total loans. Ideally, we would directly examine guaranteed and non-guaranteed preferential loans, but such data are unavailable. We therefore use CG_{it} and Non_CG_{it} as proxies. These proxies may introduce attenuation bias because the dependent variable contains noise unrelated to the policy target loans that potentially weakens the statistical significance of the estimated coefficients. Nonetheless, if significant results are obtained despite this attenuation bias, they would show that the policy effect is strong.

Our main independent variable is the interaction term $\text{BOJ_operation}_t \times \text{After}_t$ in which BOJ_operation_t is the amount of funds outstanding at time t provided through the BoJ's COVID operation, and After_t is a post-2021 dummy.⁹ To the extent that the 2021 policy change affected banks' lending behavior, β_3 should be negative when Y_{it} is either CG_ratio_{it} , d_CG_share_{it} , or CG_{it} ; and positive when Y_{it} is Non_CG_{it} . We also add a standalone term BOJ_operation_t to

⁹ Note that this is not a DID specification because we do not have a *control group* (i.e., banks not participating in the COVID operation) in our sample. Our identification strategy is rather to take advantage of the exogenous policy change.

control for the baseline effect of the BoJ's funds provision throughout the sample period, although this variable may also capture the effect of reverse causality.

We additionally use Asset_{it-1} , a bank i 's total assets at $t-1$ to control for any size-related effect, After_t to capture any structural changes after March 2021, bank fixed effects (γ_i) to control for any effect of time-invariant bank-specific factors, and prefecture-year fixed effects (δ_{kt}) to control for effects of time-variant prefecture-level factors, especially loan demand in prefecture k where bank i 's headquarters are located. Robust standard errors clustered at the bank level are used. Table 1 has a summary of the descriptive statistics for the variables.

Table 1 Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CG_ratio	1,027	0.0689	0.0465	0.0058	0.3261
d_CG_ratio	927	0.0028	0.0088	-0.0334	0.0900
CG (billion yen)	1,027	178	177	838	1,169
Non_CG (billion yen)	1,027	5,174	13,800	166	96,500
Total_Loans (billion yen)	1,027	5,352	14,000	181	97,100
Asset_t-1 (billion yen)	1,027	10,800	35,100	258	268,000

4. Results

Table 2 presents the estimation results. In Column (1) where the dependent variable is CG_ratio_{it} , the coefficient for the interaction term is negative and statistically significant. This result is similar in column (2) where the dependent variable is d_CG_ratio_{it} . These findings indicate that the 2021 policy

change decreased the ratio of guaranteed loans in private banks' loan portfolios.¹⁰

¹⁰ The coefficient for $BOJ_operation_t$ is positive and significant, which may indicate that the COVID operation promoted guaranteed loans, but it might also be an artifact of the reverse causality.

Table 2 Effect of the institutional change in the COVID operation

Variable	(1) CG_ratio	(2) d_CG_ratio	(3) CG	(4) Non_CG	(5) Total_Loans
After	0.0349 *** (13.86)	0.0420 *** (11.83)	115789 *** (10.02)	-267355 (-1.61)	-151566 (-0.93)
BOJ_operation×year_After (×1 million)	-0.0506 *** (-13.28)	-0.0547 *** (-11.94)	-0.1098 *** (-9.62)	0.1685 (0.02)	0.0587 (0.36)
BOJ_operation (×1 million)	0.0506 *** -13.86	0.0565 *** -11.63	0.1197 *** (10.22)	0.1277 * (1.96)	0.2474 *** (3.59)
Asset_t-1 (×1 million)	-0.0002 *** (-7.09)	-0.0001 (-0.97)	-0.002 (-1.07)	0.1052 * (1.70)	0.1028 * (1.67)
Constant	0.06503 *** (21.36)	-0.0194 *** (-7.46)	143798 *** (6.18)	4074684 *** (6.17)	4218481 *** (6.44)
Bank_fixed_effects	YES	YES	YES	YES	YES
Prefecture_year_fixed effects	YES	YES	YES	YES	YES
Observations	1027	926	1027	1027	1027
Ajusted R-squared	0.9573	0.5583	0.9558	0.9978	0.9978

However, the decrease in the ratio of guaranteed loans does not necessarily mean an increase in the amount of non-guaranteed loans, so we decompose CG_ratio into the amount of guaranteed, non-guaranteed, and total loans. Column (3) shows the results for Non_CG , the numerator of CG_ratio_{it} . They indicate that the coefficient for the interaction term is negative and statistically significant—consistent with column (1). In contrast, the term has no effect on Non_CG (column (4)) or Total Loans (column (5)). Although private banks decreased guaranteed loans due to the policy change in March 2021, there was no increase in their non-guaranteed loans or total ones.

Taken together, we find that the BoJ's 2021 policy change on the CAB interest payment scheme decreased the ratio of guaranteed loans in banks' portfolios, meaning that the additional interest rate on reserve balances effectively changed bank behavior. This decrease mainly reflects a decrease in guaranteed loans rather than an increase in non-guaranteed ones. Because our measure of non-guaranteed loans includes non-preferential lending that was not the policy target, the estimated effects may understate the true effect on non-guaranteed preferential loans. Nevertheless, our finding of a strong negative effect on guaranteed loans indicates that the 2021 policy change reduced banks' reliance on government guarantees as the COVID pandemic receded.

References

- Afonso, A., and Sousa-Leite, J. (2020). "The transmission of unconventional monetary policy to bank credit supply: evidence from the TLTRO." *The Manchester School*, 88: 151–171.
- Albertazzi, U., Nobili, A. and Signoretti, F.M. (2021). "The Bank Lending Channel of Conventional and Unconventional Monetary Policy." *Journal of Money, Credit and Banking*, 53: 261–299.
- Anbil, S., Carlson, M., and Styczynski, M. (2023). "The effect of the Federal Reserve's lending

- facility on PPP lending by commercial banks.” *Journal of Financial Intermediation*, 55: 101042.
- Benetton, M., and Fantino, D. (2021). “Targeted monetary policy and bank lending behavior.” *Journal of Financial Economics*, 142: 404–429.
- Berger, A.N., Black, L.K., Bouwman, C.H.S., and Dlugosz, J. (2017). “Bank loan supply responses to Federal Reserve emergency liquidity facilities.” *Journal of Financial Intermediation*, 32: 1–15.
- Churm, R., Joyce, M., Kapetanios, G., and Theodoridis, K. (2021). “Unconventional monetary policies and the macroeconomy: The impact of the UK's QE2 and funding for lending scheme.” *The Quarterly Review of Economics and Finance*, 80: 721–736.
- Hirata, A., Ito, Y., and Kasai, Y. (2024). “Impact of the Fund-Provisioning Measure to Stimulate Bank Lending in Japan.” Bank of Japan Working Paper No.24-E-24.
- Lopez, J.A., and Spiegel, M.M. (2023). “Small business lending under the PPP and PPPLF programs.” *Journal of Financial Intermediation*, 53: 101017.
- Marsh, W.B., and Sharma, P. (2024). “Loan guarantees in a crisis: An antidote to a credit crunch?” *Journal of Financial Stability*, 72: 101244.
- Matjaž, V. (2024). “The transmission of targeted monetary policy to bank credit supply.” *The Quarterly Review of Economics and Finance*, 94: 104–112.
- Matsumoto, R. (2025). “Corona-ki no Shikin-chotatsu-shien-ope ga Chiiki-kinyu-kikan ni Ataeta Eikyo (Effects of the Bank of Japan’s COVID-19 Funding Operations on Regional Financial Institutions).” *Kinyu Keizai Kenkyu (Review of Monetary and Financial Studies)*, forthcoming. (in Japanese)
- Naiborhu, E.D., and Ulfa, D. (2023). “The lending implication of a funding for lending scheme policy during COVID-19 pandemic: The case of Indonesia Banks.” *Economic Analysis and Policy*, 78: 1059–1069.



**The Centre for Responsible Banking & Finance
CRBF Working Paper Series**

Department of Finance, University of St Andrews
The Gateway, North Haugh,
St Andrews, Fife,
KY16 9RJ.

Scotland, United Kingdom
<https://crbf.wp.st-andrews.ac.uk/>



Recent CRBF Working papers published in this Series

Second Quarter | 2026

26-014 **Jeremy Burke, Carly Urban, Olivia Valdes:** Is Financial Knowledge Really Declining? Randomized Evidence on the Effects of Smartphone Responses.

26-013 **Xian Gu, Felix Irresberger, Hao Zhao, Yun Zhu:** Banking on Forest.

26-012 **Frederik Pietig:** Sweeping It under the Rug? The Securitisation of Climate-Stressed Loans by European Banks.

26-011 **George Kladakis and Alexandros Skouralis:** The Dark Side of Bank Branch Closures.

First Quarter | 2026

26-010 **Yusuf Emre Akgunduz, Kubra Bolukbas, Mehmet Selman Colak, Merve Demirbas Ozbekler, Muhammed Hasan Yilmaz:** Bank Inflation Expectations, Risk Premia and Lending Behavior.

26-009 **Yong Kyu Gam, Chunbo Liu, Yongxin Xu:** Risky Tweets in Quiet Times: Social Media Attention and Bank Deposit Flows.

26-008 **Dimitris K. Chronopoulos, Selçuk Gül, Abdullah Kazdal, John O.S. Wilson, Muhammed Hasan Yilmaz:** When Global Energy Costs Travel: Domestic Trade Network Channel to Inflation Expectations.

26-007 **Donal McKillop, Anna Sobiech, John O.S. Wilson, Dimitris Chronopoulos:** Mergers: A Study of Irish Credit Unions.

26-006 **Pejman Abedifar and Mohammad Eslami:** Devotion without Action: Islam, Charity, and Poverty in Comparative Perspective.



University of St Andrews
Scotland's first university

600 YEARS
1413 – 2013