ONLINE APPENDIX

What Policy Combinations Worked?

The Effect of Policy Packages on Bank Lending during COVID-19*

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Abstract

In response to COVID-19, countries frequently adopted multiple types of policies to address the economic and financial effects of the pandemic. This paper analyzes the impact on bank lending of combinations or packages of policies (fiscal, monetary, and prudential) adopted across a broad sample of countries. Using a comprehensive policy announcement level dataset together with bank level information, we find that lending grew faster at banks in countries which announced large packages combining fiscal, monetary, and prudential measures ("All-out" packages), especially when uncertainty was high. Both the scope and size of policy packages were important: packages combining all three types of policies, but where only some were large, were relatively less effective in enhancing credit. The impact was stronger among more constrained banks with low equity levels. "All-out" packages also increased liquidity for bank dependent firms but did not disproportionately benefit unviable firms.

Keywords: COVID-19, policy packages, policy effectiveness, bank lending.

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* The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF, its Management and Executive Board, or IMF policy and should not be reported as representing the official views of the OECD or of its member countries.

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Online Appendix: Additional Figures and Tables

Figure 15: Policy Definitions

Notes: This table defines the individual policy categories we include, drawing on Kirti et al. (2023). Size (Y/N) denotes whether size information is available, where Y* indicates that both the announced and actual size are recorded.

Policy	Definition	Size
Fiscal		
1. Grants	Spending by the central government with near-term budgetary impact. Typical examples include transfers to firms or households, health spending, transfers to local governments, subsidies to social safety nets, and other spending (such as infrastructure spending) that directly or indirectly responds to Covid-19. If a measure has a long-term nature, we record the estimated impact during 2020 and 2021. While we do not include non-discretionary spending, we do include discretionary policy actions related to automatic stabilizers such as coverage expansions and extra funding.	Y
2. Tax reliefs	Reductions in any type of taxes where the amounts covered do not need to be repaid in the future. Contributions to social security and fees paid to the government are also considered taxes in our tracker.	Y
3. Tax deferrals	Direct or indirect deferrals of any type of taxes. Typical examples of indirect deferrals include (i) accelerated depreciation, which essentially moves future tax credits to the current period, and (ii) suspension of penalties on late tax payments.	Y
4. Equity participations	Direct equity participations in private or state-owned firms, or equity investments in investment funds that provide capital to firms. Typical examples include (i) setting up a fund that purchases shares in the secondary market, (ii) direct capital contributions to private or state-owned firms, (iii) co-investment with private investors, in which we only include the public portion.	Y
5. Public loans	Loans granted by the public sector, either directly from the government or from state-owned financial institutions. However, two types of loans are not included: (i) loans from foreign governments or international organizations; (ii) explicit on-lending from the central bank channeled through banks (this would be a lending operation).	Y
6. Public guarantees	Guarantees granted by the public sector. Guarantees must target financial activities. We further distinguish two types of guarantees: (i) credit guarantees, which cover loans to the real sector; (ii) other guarantees, which mainly cover the funding side of financial intermediaries.	Y

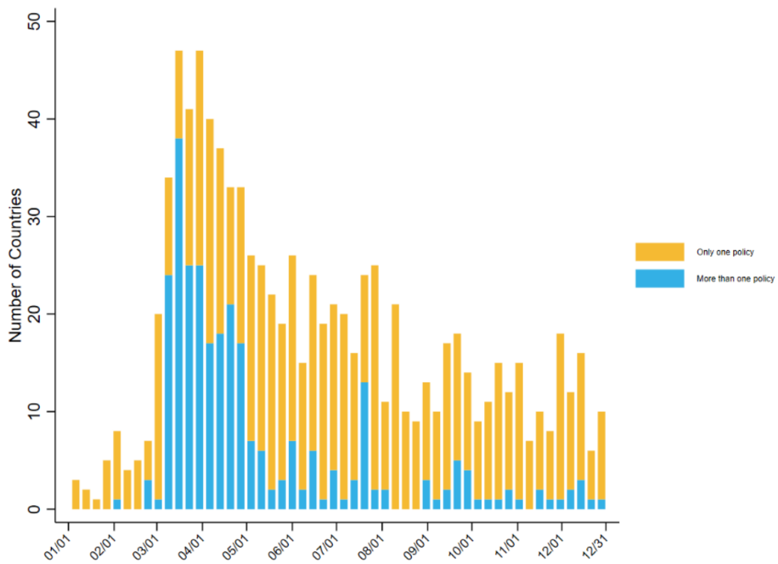
7. Moratoria	Moratoria, granted either by the government or by the private sector, include (i) debt moratoria; (ii) suspension of non-debt payments, including rents, insurance premia, utility fees, etc.; (iii) suspension of bankruptcy.	N
Monetary		
8. Asset purchases	Purchases of securities, such as bonds, stocks, and commercial paper in the secondary market by the central bank. The intention should not be only to improve short-term market liquidity.	Y*
9. Policy rates	Changes in the policy interest rate. An announcement of no change or a speech on the expected rate path is not considered an actual policy. If a central bank uses multiple interest rates, we select the one that is most related to lending as the policy rate and include changes to other interest rates under the "other rates". Once we select the policy rate, we do not change it for consistency.	Y
10. Other rates	Changes in important interest rates that are not the policy rate. To be considered important, interest rates need to have broad effects, i.e., they should not be the interest rate of a narrow lending facility.	N
11. Reserve requirements (local currency)	Changes related to the reserve requirement of local currency loans. Examples include (i) changes to the ratio; (ii) changes to the penalty for breaking the reserve requirement; (iii) changes to the calculation of the ratio. Only the first one, changes to the ratio, has a size measure, while all others have a missing size value. If a country has multiple reserve ratios, we choose the one with the broadest effects as the main ratio based on the context. Once we select the main ratio, we do not change it for consistency. Only the main ratio has sizes, while others only have a missing size value.	Y
12. Reserve requirements (foreign currency)	Changes related to the reserve requirement of foreign currency loans. Same as local currency reserve requirements.	Y
13. Credit facilities	Credit facilities target the creation of medium- and long-term credit in response to Covid. Typical examples include (i) special lending programs in the form of direct lending, repos, rediscounting, on-lending, etc.; and (ii) changes in terms for existing lending facilities with the intention of increasing access to credit. Recipients may include entities that are not financial institutions. The intention should not be only to improve short-term market liquidity.	Y*
14. Market liquidity measures	Short-term lending or interventions in asset markets, with the explicit and sole intention of improving short-term market liquidity. We determine the intention of a measure based on its stated aim as well as any relevant context.	N
15. Foreign exchange interventions	Interventions with the intention to influence foreign exchange markets. Tools include outright purchases or sales, non-deliverable forwards, regulatory actions, etc.	N

	We assign "+1" to measures intended to strengthen or stabilize exchange rates, and "-1" to measures explicitly intended to weaken exchange rates.	
16. Central bank swap lines	Swap lines between central banks. We only record it for the counterparty with a relatively greater need for foreign exchanges. If relative need cannot be determined, we record the measure for both sides.	Y
Prudential		
17. Macroprudential buffers	Three specific buffers are included: the countercyclical capital buffer (CCyB), the capital conservation buffer (CCoB), and the systemic risk buffer (SyRB). Sizes are actual buffer changes. Therefore, as is often the case, if a measure is to postpone scheduled future buffer changes, we recognize the measure but code its size as missing. If different banks are subject to different buffer changes, we choose one that affects most banks for CCyB and CCoB and take a simple average for SyRB.	Y
18. Buffer usability	Allowing or encouraging banks to use their excessive capital-related buffers (if any), including but not limited to CCyB, CCoB, and SyRB. This is typically used to address the stigma effect. But there is no change to the minimum levels of these ratios or any postponement of planned increase.	N
19. Capital requirements	Capital-related rules that do not belong to the three capital buffers and buffer usability. Examples include rules related to the CET1 ratio or the leverage ratio, total loss-absorbing capacity, risk weighting, and other special accounting treatments.	N
20. Dividend restrictions	Banks are asked to either partially or fully cut dividends for capital preservation.	N
21. Special provisioning rules	Changes to provisioning-related rules, such as provisioning ratios or loan classification, in response to Covid-19	N
22. Borrower-based measures	Prudential regulations based on characteristics of borrowers, such as debt-to-income ratios, loan-to-value ratios, or other similar ratios.	N
23. Supervisory expectations	Regulators' expectations on supervisory issues such as stress testing, compliance with certain rules, certain accounting practices, etc.	N
24. Lending standards	Changes to rules or recommended practices related to bank lending standards. Lending standards can relate to firm quality (e.g., credit quality assessments), loan concentration requirements, and terms of credit (e.g., interest rate caps).	N
25. Reporting requirements	Changes to reporting requirements with the intention of easing banks' regulatory burden. Note that some regulators may request additional information from banks to better monitor Covid, but we do not code this as a tightening measure if there is no intention of regulatory tightening.	N

26. Liquidity requirements	Rules related to the liquidity level that banks need to maintain, such as changes to liquidity ratios and permission of temporarily breaking liquidity ratios.	N
27. Other prudential measures	Non-capital prudential measures on banks that are not included in other policy types.	N

Figure 16: Distribution Of Multiple Policy Packages at A Weekly Frequency

Notes: This figure shows the number of countries announcing packages consisting of more than one policy group (monetary, fiscal and prudential) in each week of 2020 compared to the number of countries announcing packages with policies in just one group.



Source: Kirti et al. *(2023)*

Figure 17: Summary Statistics

Notes: Shows summary statistics for key variables in the empirical analysis. See the main text for details on definitions of variables.

Variable	Units	Obs	Mean	Std. Dev.	Min	Max
Net Customer Loans (QoQ Log change)	Basis Points	7480	145.4	668.0	-1943.1	2451.0
Bank Controls (i) (Lagged Equity to asset ratio)	Percentage Points	7480	10.9	4.0	4.8	21.2
Bank Controls (ii) (Lagged Natural Log of Assets)		7480	15.1	1.9	12.1	19.0
Bank Controls (iii) (Lagged Deposit to liability ratio)	Percentage Points	7480	84.0	13.8	47.8	98.7
Bank Controls (iv) (Lagged Net Customer loan to Asset Ratio)	Percentage Points	7480	63.1	14.0	29.3	83.0
Health Control (Standard deviations of log change in COVID cases per thousand)		7480	1.6	1.6	-1.4	6.3
De Facto Mobility Control (Average of workplace and public transit indices, from Google)	Percentage change	7480	-26.7	12.1	-67.2	8.8
Macro Control (Quarterly Revisions in IMF GDP growth forecasts)	Percentage Points	7480	-2.2	6.5	-21.4	13.8
Financial Stress Control (Change in Sovereign Spreads from start of quarter to within quarter peak)		7480	42.3	94.2	0.0	904.2
Forecast Dispersion Control (Change in sum of standard deviation of GDP forecasts 1- and 2-years ahead)		6960	0.1	1.2	-3.7	4.2

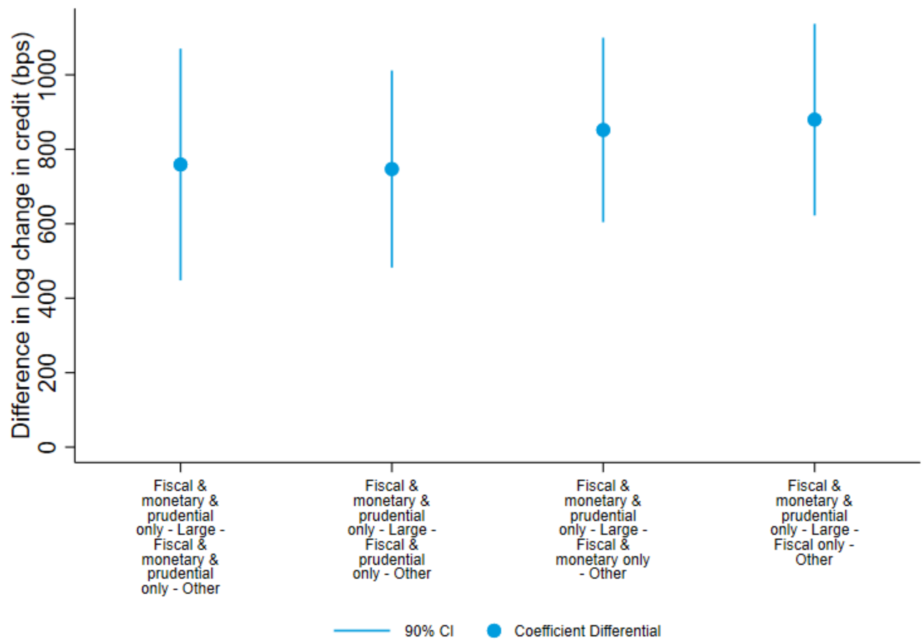
Figure 18: Figure 6 Repeated Using Counts of Prudential Policies As Proxy For Size

Notes: This table repeats Figure 6 in the manuscript but also requires the count of prudential policies to be in the top decile for packages including prudential policies to be treated as large.

	Log change in credit (BPS)		
	(1)	(2)	(3)
Fiscal only – Other	353.3***	382.2**	50.4
	(124.2)	(167.7)	(154.1)
Fiscal only – Large	-164.9	-141.8	-520.3***
	(133.5)	(181.1)	(174.8)
Fiscal & monetary only – Other	251.5	277.4	2.3
	(224.8)	(257.9)	(235.6)
Fiscal & monetary only – Large	-198.5*	-167.6	-534.8***
	(105.4)	(150.0)	(169.5)
Fiscal & prudential only – Other	463.5***	494.6***	141.5
	(113.3)	(145.8)	(157.5)
Fiscal & monetary & prudential – Other	382.4***	415.8***	163.0
	(103.1)	(134.0)	(121.9)
Fiscal & monetary & prudential – Large	999.0***	1036.5***	913.3***
	(54.6)	(115.9)	(93.2)
Bank FE	Y	Y	Y
Bank Controls	Y	Y	Y
Health Controls	N	Y	Y
De facto mobility Controls	N	Y	Y
Macro Controls	N	N	Y
Financial Stress Controls	N	N	Y
R^2	0.50	0.50	0.53
Bank-Quarters	7,480	7,480	7,480
Banks	1,496	1,496	1,496
Countries	49	49	49

Figure 19: Difference in Effects Between "All-Out" Packages and Other Packages Without Controls

Notes: This figure is a version of Figure 7 without control variables. The coefficient plot shows the estimated difference between the effect of credit growth from the final package in the third column of Figure 6 (the "All-out" package) relative to all other packages included in the specification without any control variables or fixed effects.



Source: Authors calculations

Figure 20: Number Of Country-Quarters For Each Package In Figure 9

Notes: Panel A shows the number of country-quarters with each type of package across each column of Figure 9, and Panel B decompose the 'No policies or other packages' category into its constituent parts.

Panel A: Distribution of country-quarters by package

	Decile	Quartile	Tercile	Median
Fiscal only – Other	22	21	19	15
Fiscal only – Large	0	1	3	7
Fiscal & monetary only – Other	28	28	26	20
Fiscal & monetary only – Large	0	0	2	8
Fiscal & prudential only – Other	25	23	22	15
Fiscal & prudential only – Large	0	2	3	10
Fiscal & monetary & prudential – Other	97	86	79	64
Fiscal & monetary & prudential – Large	6	17	24	39
No policies or other packages	18	18	18	18
Total	196	196	196	196

Panel B: Granular breakdown of 'no policies or other packages' category

	Decile	Quartile	Tercile	Median
No policies or other packages	18	18	18	18
Monetary only	6	6	6	6
Prudential only	1	1	1	1
Monetary & prudential only	3	3	3	3
No policies	8	8	8	8

Figure 21: Difference In Coefficients Between" All-Out" Packages And Other Packages In Figure 9

Notes: This table shows the estimated difference between 'Fiscal & monetary & prudential – Large' packages and all other packages for each column in Figure 9. The table shows estimated coefficients and standard errors.

	Decile	Quartile	Tercile	Median
'All-out" – (Fiscal only – Other)	602.9***	574.8***	536.7***	234.3
	(125.1)	(140.0)	(149.0)	(102.1)
'All-out" – (Fiscal only – Large)	724.2***	634.5*	526.3**	69.4
	(226.5)	(341.3)	(252.0)	(161.2)
"All-out" – (Fiscal & monetary only – Other)	563.4***	481.8***	401.0***	106.5
	(137.8)	(138.6)	(139.2)	(97.8)
"All-out" – (Fiscal & monetary only – Large)	724.2***	696.4***	627.2***	186.9
	(226.5)	(229.3)	(136.2)	(149.5)
"All-out" – (Fiscal & prudential only – Other)	699.8***	653.3***	599.3***	321.6
	(133.1)	(149.4)	(166.8)	(197.6)
"All-out" – (Fiscal & prudential only – Large)	724.2***	835.5***	618.4***	233.6
	(226.5)	(130.4)	(203.8)	(130.0)
"All-out" – (Fiscal & monetary & prudential – Other)	695.9***	625.7***	580.9***	258.4
	(163.9)	(163.3)	(169.0)	(155.2)

Figure 22: Figure 6 Repeated with Narrower Omitted Category

Notes: This table repeats Figure 6 but drops country-quarters in which some policies are observed but policies are not in any of the packages explicitly shown. The counterfactual is therefore restricted explicitly to country-quarters with no policies.

	Log change in credit (BPS)		
	(1)	(2)	(3)
Fiscal only - Other	340.9***	358.8*	48.5
	(125.2)	(188.4)	(181.2)
Fiscal & monetary only - Other	253.6	259.4	18.5
	(210.5)	(280.5)	(259.1)
Fiscal & prudential only - Other	496.1***	501.7***	199.5
	(112.8)	(175.0)	(185.0)
Fiscal & monetary & prudential only - Other	385.4***	389.2**	160.3
	(110.4)	(176.5)	(167.8)
Fiscal & monetary & prudential only - Large	895.2***	892.1***	748.7***
	(126.8)	(234.4)	(235.8)
Bank FE	Y	Y	Y
Bank Controls	Y	Y	Y
Health Controls	N	Y	Y
De facto mobility Controls	N	Y	Y
Macro Controls	N	N	Y
Financial Stress Controls	N	N	Y
R^2	0.50	0.50	0.53
Bank-Quarters	7,338	7,338	7,338
Banks	1,496	1,496	1,496
Countries	49	49	49

Figure 23: Figure 6 Repeated Controlling for Lagged Credit Growth

Notes: This table repeats Figure 6 but controls for one lag of credit growth at the bank level (i.e., one lag of the dependent variable) to control for base effects.

	Log change in credit (BPS)		
	(1)	(2)	(3)
Fiscal only - Other	360.8***	463.2***	101.0
	(128.8)	(149.8)	(167.0)
Fiscal & monetary only - Other	269.3	341.9	38.4
	(202.6)	(242.7)	(244.5)
Fiscal & prudential only - Other	476.7***	591.1***	198.6
	(103.6)	(138.6)	(185.3)
Fiscal & monetary & prudential only - Other	327.6***	419.1***	108.9
	(84.0)	(115.9)	(155.3)
Fiscal & monetary & prudential only - Large	863.7***	868.0***	679.7***
	(126.2)	(157.9)	(211.9)
Bank FE	Y	Y	Y
Bank Controls	Y	Y	Y
Health Controls	N	Y	Y
De facto mobility Controls	N	Y	Y
Macro Controls	N	N	Y
Financial Stress Controls	N	N	Y
R^2	0.51	0.52	0.54
Bank-Quarters	7,480	7,480	7,480
Banks	1,496	1,496	1,496
Countries	49	49	49

Figure 24: Figure 6 Repeated with Large Rate Cuts Defined In Absolute Terms

Notes: This table repeats Figure 6 but defines large policy rate cuts in absolute terms rather than relative to the pre-COVID level.

	Log change in credit (BPS)		
	(1)	(2)	(3)
Fiscal only - Other	338.5***	340.7*	26.9
	(122.7)	(180.7)	(174.0)
Fiscal & monetary only - Other	280.5	273.8	26.1
	(205.3)	(267.2)	(247.3)
Fiscal & prudential only - Other	476.3***	468.1***	149.9
	(113.7)	(170.2)	(181.6)
Fiscal & monetary & prudential only - Other	372.0***	361.3**	125.8
	(105.7)	(170.5)	(162.1)
Fiscal & monetary & prudential only - Large	891.9***	874.9***	736.4***
	(126.8)	(231.1)	(231.3)
Bank FE	Y	Y	Y
Bank Controls	Y	Y	Y
Health Controls	N	Y	Y
De facto mobility Controls	N	Y	Y
Macro Controls	N	N	Y
Financial Stress Controls	N	N	Y
R^2	0.49	0.49	0.51
Bank-Quarters	7,480	7,480	7,480
Banks	1,496	1,496	1,496
Countries	49	49	49

Figure 25: Figure 6 Repeated With Fewer Controls

Notes: This table repeats Figure 6 but shows additional specifications with fewer controls than each specification in Figure 6.

	Log change in credit (BPS)		
	(1)	(2)	(3)
Fiscal only - Other	363.4***	354.5**	233.9
	(120.5)	(172.7)	(182.2)
Fiscal & monetary only - Other	312.3*	290.6	152.4
	(184.4)	(241.7)	(262.9)
Fiscal & prudential only - Other	460.3***	498.9***	310.9
	(123.4)	(146.8)	(202.8)
Fiscal & monetary & prudential only - Other	410.1***	382.8**	235.9
	(102.3)	(146.8)	(183.4)
Fiscal & monetary & prudential only - Large	902.4***	898.3***	808.4***
	(132.7)	(170.4)	(244.9)
Bank FE	N	Y	Y
Bank Controls	Y	Y	Y
Health Controls	N	Y	Y
De facto mobility Controls	N	N	Y
Macro Controls	N	N	Y
Financial Stress Controls	N	N	N
R^2	0.29	0.49	0.50
Bank-Quarters	7,480	7,480	7,480
Banks	1,496	1,496	1,496
Countries	49	49	49