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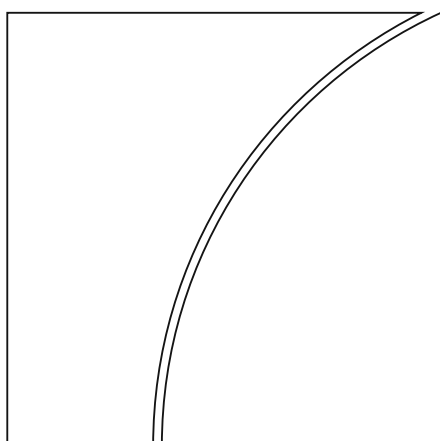
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by Carlos Cantú, Paolo Cavallino, Fiorella De Fiore and
James Yetman

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A global database on central banks' monetary responses to Covid-19

Carlos Cantú, Paolo Cavallino, Fiorella De Fiore and James Yetman^{1,2}

Abstract

The Covid-19 pandemic has been a global shock of unprecedented size that has hit most countries around the world. Central banks have responded quickly, on a massive scale. We present a novel [database](#) that provides information on central banks' responses to Covid-19 in 39 economies, including both advanced and emerging market economies. Monetary policy announcements are listed and classified under five types of tools: interest rate measures, reserve policies, lending operations, asset purchase programmes and foreign exchange operations. Within each category, the database provides additional information such as maturity, eligible counterparties, types of assets and the availability of fiscal backup. It also indicates whether the policy tool was newly introduced or had been previously deployed. The database has a companion [dashboard](#) to visualise the data graphically.

Keywords: Covid-19 crisis, monetary policy, lending operations, asset purchase programmes, FX policy, reserve policy.

JEL classifications: E43, E44, E52, E58, G01.

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² The information included in the database derives from public sources and summarises the most relevant characteristics of each announcement according to our classification. As such, it is not meant to be exhaustive. The classification of the monetary policy tools reflects criteria aimed at facilitating a cross-country comparison. Divergences relative to each central bank's own classification are therefore possible. Responsibility for any errors, interpretations, or omissions lies solely with the authors and not with the Bank for International Settlements. Suggestions, feedback and comments can be addressed to Covid19MPDatabase@bis.org.

1. Introduction

The unprecedented health shock of the Covid-19 pandemic and its unparalleled economic repercussions have been felt worldwide, impacting most countries and simultaneously affecting demand, supply and financial conditions.

During spring 2020, lockdowns imposed to limit the spread of the virus led to a generalised sudden stop, severely compressing productive activities. Containment and social distancing measures contributed to a sharp reduction of demand for many goods and services – particularly in sectors like recreation, food services and travel. The abrupt contraction in workers' income and firms' cash flow increased the risk of delinquency on mortgages and loans to consumers and businesses, raising concerns about the health of the financial system. Moreover, as the pandemic spread, uncertainty rose and equity markets came under stress. The ensuing dash-for-cash impacted the market for US dollar funding (Avdjiev et al (2020)) as well as fixed income asset markets (Schrimpf et al (2020)).

Overall, central banks around the world reacted quickly and on a massive scale to the pandemic – often in tandem with fiscal authorities. In advanced economies (AEs), their goal was twofold. First, and early during the pandemic, monetary policy measures aimed at stabilising financial markets and preventing the pandemic from turning into a renewed financial crisis. Purchases of public assets and liquidity provision under favourable conditions were the main instruments of this type of intervention. When the liquidity situation of the household and corporate sectors started to deteriorate, central banks' overriding goal became one of cushioning the contraction in real activity by ensuring the provision of credit to the private sector under attractive conditions, despite rising credit risk (Cavallino and De Fiore (2020)).

The response of central banks in emerging market economies (EMEs) reflected a number of specific factors faced by those economies (Aguilar and Cantú (2020)). An important aspect was that in early 2020, most EMEs were at a relatively low point of the business cycle, with aggregate demand generally below potential. Moreover, broad and bold actions by central banks in AEs during spring curbed the appreciation of the US dollar and calmed the turmoil in global financial markets. The subsequent easing of financial conditions in EMEs helped their central banks orient monetary policy towards domestic objectives – namely support of aggregate demand – in spite of large capital outflows and sharp currency depreciations. In some countries, EME central banks ventured into uncharted territory and complemented interest rate reductions with asset purchase programmes.

The global response of monetary policy to Covid-19 raises some questions. Did central banks react equally, swiftly and forcefully in different economies? Which measures were deployed most extensively? Did the response entail the adoption of new tools or merely the extension of existing ones?

We provide answers to these questions based on a novel [database](#) that provides information on central banks' responses to Covid-19 in 39 economies around the world. Monetary policy announcements are classified according to the tool deployed: interest rate measures, reserve policies, lending operations, asset purchase programmes and foreign exchange operations. Within each category, the database provides additional information on each sub-category of tool (eg changes in interest rates vs forward guidance), maturity (short vs long), conditionality (eg targeted vs non-targeted lending operations), counterparties (private or public sector), types of assets eligible for purchase, and availability of fiscal backup. The database also clarifies whether the announced policy tool was first implemented during the pandemic or previously used by the same central bank. In the latter case, it provides information on the attributes that were modified: the maturity, type of collateral, frequency of operations, set of eligible counterparties, pricing or other characteristics.

We complement the database with a dashboard that enables quick visualisation of measures by dates, types and economies. Links to both the database and the dashboard are provided in the appendix.

The paper proceeds as follows. In Section 2, we describe the main features of the database and summarise the information it contains. In Section 3, we use the database to characterise the monetary policy response of central banks to Covid-19 in the 39 economies represented in the database. More specifically, we compare the measures implemented by central banks in AEs and in EMEs, and their use of the different types of policies. In Section 4, we conclude. In the appendix, we provide a user guide for the database and a description of the dashboard.

2. The database

The [database](#) collects information on monetary policy measures announced during the Covid-19 pandemic by central banks in 39 jurisdictions,³ including 11 AEs and 28 EMEs.⁴

The database covers policies that i) are of a monetary nature, ii) have been announced before or at the time of their implementation, and iii) were deployed in response to the Covid-19 pandemic. To minimise the heterogeneity of the information provided, and ensure a high degree of comparability across jurisdictions, we exclude non-monetary policies. For example, we omit information about financial stability policies as well as about micro- and macro-prudential policies, even where these were implemented by central banks.⁵ We also do not report information about measures that were revealed, either directly or indirectly, to the general public only after their implementation, as is common with some forms of foreign exchange intervention. Finally, we exclude policies which are unrelated to the pandemic or its effects. For example, we do not include measures related to the introduction of central bank digital currencies.

All information is obtained from publicly available sources – mainly central banks' websites. The time span varies across jurisdictions. For each central bank, the starting point is the first announcement explicitly mentioning Covid-19 or the associated pandemic. The end-point is still moving. The database is regularly updated at the end of every second month. The updates will be carried out as long as the pandemic remains active in any of the economies in the database.

The information is summarised in seven spreadsheets. The first two spreadsheets provide details on the central banks covered and list all the monetary policy announcements made by those central banks during the pandemic. The remaining spreadsheets provide details on the monetary tools deployed, grouped in the following five categories: interest rates, reserve policies, lending operations, asset purchases, and foreign exchange. The database includes detailed information of each policy tool, with the precise details tailored to the nature of the tool.

The classification adopted in the database aims at facilitating cross-country comparisons of policies, and evaluating their effectiveness. It therefore abstracts from specific legal and implementation details that have little bearing on their macroeconomic impact. For example, whether an asset purchase programme is conducted directly by the central bank or indirectly through a Special Purpose Vehicle (SPV) is inconsequential for the purposes of our classification.

³ Link to the Covid-19 MP Database: https://www.bis.org/publ/work934_data.xlsx

⁴ More specifically, the sample includes central banks of 11 advanced economies (AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US) and 28 emerging market economies (AE, AR, BR, CL, CN, CO, CZ, DZ, HU, HK, ID, IL, IN, KR, KW, MA, MX, MY, PE, PH, PL, RO, SA, SG, TH, TR, VN and ZA).

⁵ Not all central banks in our sample are responsible for prudential policies.

The title and broad content of each spreadsheet are listed below. A link to the database and additional details of the information provided are reported in appendix A.

1. **Central banks:** Provides a list of the 39 central banks covered and the main sources of information for each of them.
2. **Announcements:** Lists all the monetary policy announcements in chronological order. An announcement is defined as a set of information communicated by a central bank regarding one of its monetary policy tools on a specific date. Thus, each announcement is uniquely identified by three attributes: economy, tool, and date. This implies that the information contained in a single press release can give rise to multiple announcements in our database, one for each of the monetary policy tools involved.⁶ This structure allows the user to connect each announcement with the relevant tool in the specific spreadsheet (described below) and, vice versa, to recover the sequence of announcements regarding each individual tool.
3. **Interest rates:** Reports all policy rate decisions, including forward guidance, as well as decisions related to other relevant interest rates, if set independently from the main policy rate.⁷
4. **Reserve policies:** Covers all measures involving central bank reserves such as changes of the requirement ratios, the compliance framework, or their remuneration.
5. **Lending operations:** Collects all tools involving central banks' lending to the private and public sectors. It provides detailed information, where available, regarding the salient characteristics of each tool, such as the start and end dates, the maturity of the operation, and its size. It also highlights if the lending operation provides incentives linked to the counterparty's lending pattern to the non-financial private sector, or if it is designed to lend directly to the public sector. Finally, it reports whether the tool was active before the crisis and, if it was, what were the major changes announced by the central bank.
6. **Asset purchases:** Provides detailed information about central banks' outright purchases of assets, including those conducted with assets of different maturity or risk profiles (ie operation twist and swap operations). It reports the size of the asset purchase programme, its duration, and the type and maturity of assets involved. As with the previous spreadsheet, it also reports whether the asset purchase programme was active before the outbreak of the pandemic and its major modifications.
7. **Foreign exchange:** Contains information about tools which involve foreign currencies and/or foreign entities. As for the previous spreadsheets, it provides detailed information, where available, regarding the duration of the tool, its size, the maturity of the assets involved, and whether the tool was active before the outbreak of the pandemic and its major modifications.

Table 1 provides an overview of the measures adopted in each economy by type of tool, and Graph 1 shows a bird's-eye view of the level of information contained in the database.

The database is complemented by a [dashboard](#) that enables quick visualisation of measures by dates, types, and economies. A link to the dashboard and a detailed description are provided in appendix B.

⁶ For example, a single press release that communicates both a policy rate cut and the establishment of an asset purchase programme is included in our database as two announcements.

⁷ Changes to the floor and ceiling of the policy rate corridor are not reported separately if they occur in tandem with changes to the policy rate.

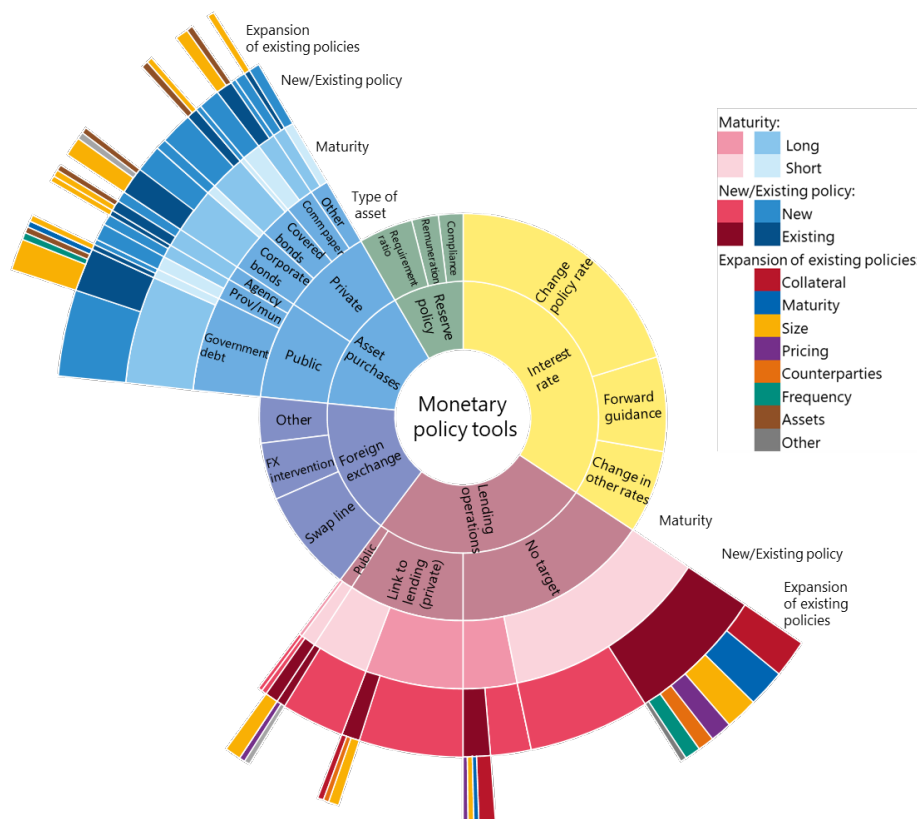
Central bank measures by category

Table 1

Advanced Economies													Middle East and Africa									
Tool type	Measures	US	EA	JP	GB	CA	AU	CH	DK	NO	NZ	SE	AE	DZ	IL	KW	MA	SA	TR	ZA		
Interest	Policy rate cut	✓			✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Lending operations	Liquidity provision	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
	Targeted lending	✓	✓	✓	✓		✓	✓				✓	✓	✓				✓	✓	✓		
Asset purchases ¹	Government bonds	✓	✓	✓	✓	✓	✓					✓	✓		✓				✓	✓		
	Commercial paper	✓	✓	✓	✓	✓							✓									
	Corporate bonds	✓	✓	✓	✓	✓							✓		✓							
	Other private		✓	✓		✓							✓									
Foreign exchange	USD swap line		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										
	Swaps ²														✓							
	Spot intervention								✓										✓			
Reserve policy	Remuneration						✓	✓				✓							✓			
	Requirement ratio	✓											✓	✓								
	Compliance																		✓			
Emerging Asia													Latin America					Eastern Europe				
Tool type	Measures	CN	HK	ID	IN	KR	MY	PH	SG	TH	VN		AR	BR	CL	CO	MX	PE	CZ	HU	PL	RO
Interest	Policy rate cut	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lending operations	Liquidity provision	✓	✓	✓	✓	✓		✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓
	Targeted lending	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓			✓	
Asset purchases ¹	Government bonds			✓	✓	✓		✓		✓						✓	✓			✓	✓	✓
	Commercial paper					✓																
	Corporate bonds					✓					✓									✓		
	Other private														✓	✓				✓		
Foreign exchange	USD swap line					✓				✓			✓				✓					
	Swaps ²			✓	✓				✓				✓	✓	✓	✓	✓	✓		✓		
	Spot intervention		✓	✓											✓					✓		
Reserve policy	Remuneration	✓		✓																		
	Requirement ratio	✓	✓	✓	✓		✓	✓					✓	✓		✓	✓	✓			✓	
	Compliance						✓	✓					✓	✓						✓		

Source: Central bank websites.

¹ Includes operations conducted with assets of different maturity or risk profile (ie operation twist and swap operations). ² Includes non-deliverable forwards.

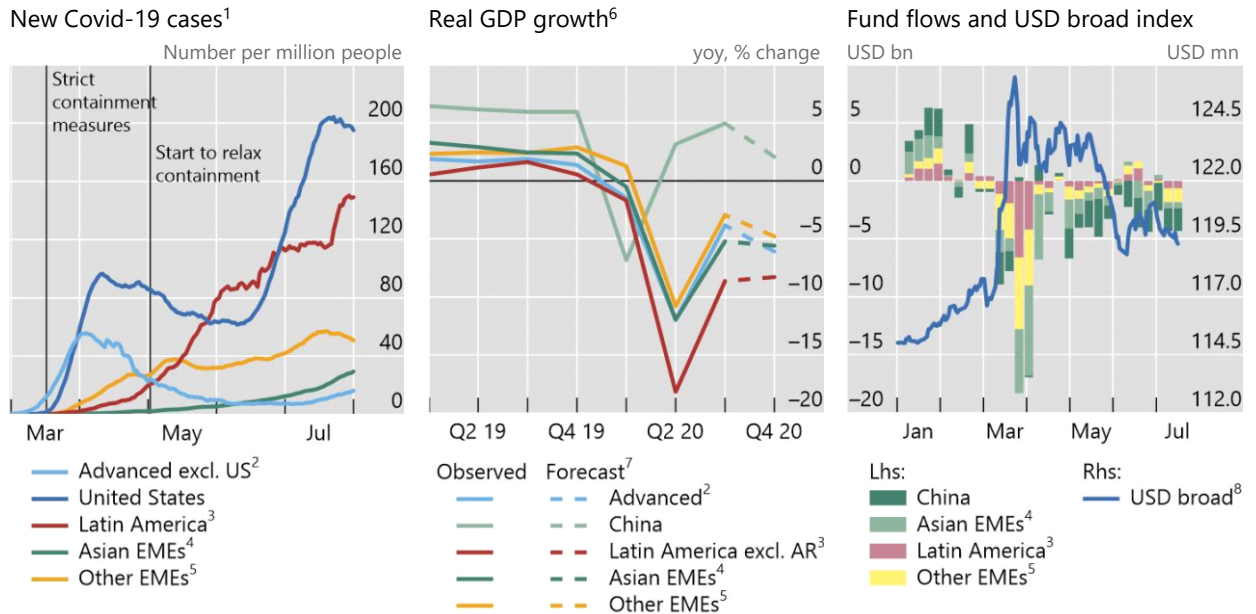


Source: Central bank websites; national data; BIS calculations.

3. Central banks' responses to Covid-19 in AEs and EMEs

We provide an example of possible uses of the database by comparing the response to Covid-19 of central banks in AEs and EMEs. We focus on the February–July 2020 period as we aim at characterising the reaction of monetary policy to the first wave of the pandemic.

The pandemic has been a common, massive shock across the global economy. While vulnerabilities – relating to population density, climate and health care capabilities, or limited monetary and fiscal policy space – as well as the timing of the shock varied substantially, virtually all countries were hit hard by the pandemic. Our focus here is on central banks' response, although measures implemented by health, fiscal and macroprudential authorities have been at least as important. Containment measures and the population reaction to them have also been key factors in determining the trajectory of case numbers (Graph 2, left-hand panel).



¹ Seven day moving average. ² AU, CA, CH, DK, FR, ES, IT, DE, GB, IL, JP, NO, NZ, SE and US. ³ AR, BR, CL, CO, MX and PE. ⁴ HK, IN, ID, KR, MY, PH, SA, SG and TH. ⁵ CZ, HU, PL, RU, RO, TR and ZA. ⁶ Mean value for economies in the region. ⁷ Mean value for the region of forecast for 2020 from October Consensus economics survey. ⁸ Trade-weighted broad USD index.

Sources: Consensus economics, *December 2020 Survey*; EPFR; John Hopkins University, Coronavirus Resource Center; national data. Federal Reserve Bank of Saint Louis.

The transmission of the Covid-19 shock to the economy differed from the transmission of other shocks that caused recent crises. For example, the Great Financial Crisis (GFC) of 2007–09 first hit financial markets hard and later propagated to the real economy through its negative effect on confidence and the tightening of credit conditions for businesses and households. The Covid-19 pandemic worked in reverse: it saw severe containment measures imposed on the real economy that led to an economic standstill (Graph 2, left and centre panels) and propagated to the financial sector (BIS (2020)). In March 2020, corporate spreads in AEs surged globally. The markets for commercial paper, along with asset-backed and mortgage-backed securities, froze in many countries. Equity prices fell sharply and implied volatilities jumped for a wide range of assets. A dash-for-cash on a global scale also disrupted fixed income asset markets. The US Treasury market experienced a sell-off and a sharp increase in long-term yields (Schrimpf et al (2020)) while euro area sovereign spreads widened substantially. In EMEs, the Covid-19 shock triggered a sudden stop in capital flows, which curtailed private and public external financing (Graph 2, right-hand panel). The retrenchment in capital flows led to a sharp currency depreciation and a further tightening of financial conditions. Local currency bond markets sold off and government bond yields rose sharply in several EMEs (Hoerdahl and Shim (2020)).

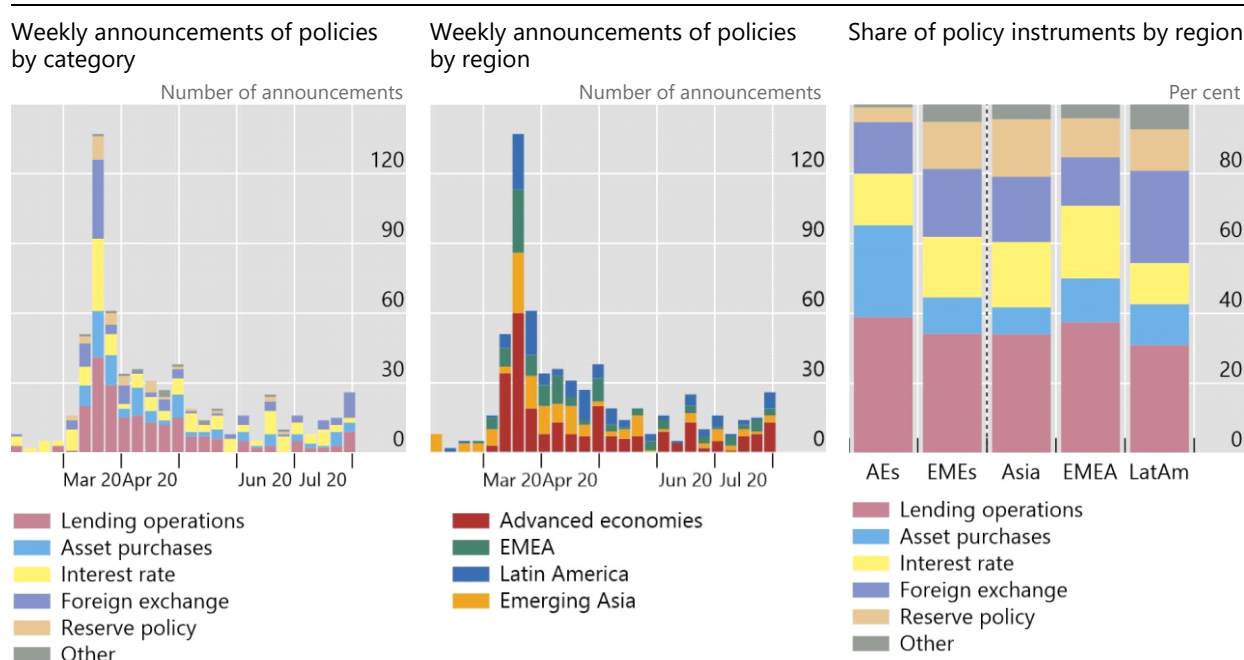
Our database provides information on the announcements of monetary policy measures from the initial outburst of the pandemic. We use this information to describe the strength and scope of intervention in each jurisdiction, as well as to compare the monetary policy response between AEs and EMEs. Graph 3 provides an overview of the number of central bank announcements by policy category and by region from 1 February to 30 July 2020. The number of announcements (left-hand panel) peaked in early March but displays a long tail right to the end of our sample period. This partially reflects the fine-tuning of the policy responses, as policymakers learnt from each other and from the markets' reactions to their policies. The nature of the announced measures varied over

time. The immediate goal of central banks was to cushion the contraction in economic activity by ensuring a smooth functioning of the financial system. The initial policy announcements thus mostly involved the policy rate. As lockdown measures started to be enforced, central banks increasingly resorted to lending operations. These measures provided liquidity to banks to facilitate lending to firms affected by the containment measures. At the same time, central banks, particularly in EMEs, announced foreign exchange operations to ease exchange rate pressures and reduce exchange rate volatility. As time progressed, asset purchase announcements gained in prominence. In the initial phase of the crisis, central banks focused on improving market functioning, while at later stages the focus changed to facilitating the financing of both private and public sectors. Throughout the sample period, central banks resorted to reserve policies to free liquidity restricted by prudential regulation.

Central banks' policy measures (announcements and instruments)

February to July 2020

Graph 3



Advanced economies = AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US; Emerging Asia = CN, HK, ID, IN, KR, MY, PH, SG, TH and VN; Europe, the Middle East and Africa = AE, CZ, DZ, HU, IL, KW, MA, PL, RO, SA, TR and ZA; Latin America = AR, BR, CL, CO, MX and PE.

¹ "Other" category contains announcements on loan guarantee programmes, technical changes to facilities and changes to central banks' law.

Source: Central bank websites; BIS calculations.

The timeline of announced measures reflects the spread of the virus by region (Graph 3, centre panel). Emerging Asia figures prominently in the early weeks, as it was the first epicentre of the pandemic. As the virus spread through Europe and arrived in America, central banks there responded promptly and strongly. By the third week of March, most countries had implemented strict lockdown measures, coincident with the peak in policy announcements.

The database differentiates between policy announcements (identified by date) and policy instruments (identified by the ID number). This allows us to identify the proportion of policy instruments by category in each region (Graph 3, right-hand panel). Policy actions taken by central banks in AEs involved mainly lending operations (40%) or asset purchases (25%). They also often included foreign exchange policies and interest rate policies (15% each) while reserve policies were

less common (5%). AE central banks naturally leaned on their previous experience. Policy measures implemented during the GFC remained useful and, importantly, could be re-deployed rapidly, often in a matter of weeks (Cavallino and De Fiore (2020)). A novel aspect of the crisis was the illiquidity faced by households and firms as a consequence of the negative impact of the shock on both supply and demand. Central banks reacted by facilitating the flow of credit to workers and corporates. In doing so, they extended their traditional crisis role as lenders of last resort to the financial sector to become providers of liquidity to the private non-financial sector as well.

Among EME central banks, the most common category of policy action was also lending operations (35%). But the proportions and rankings of other policy categories differed between EMEs and AEs. EMEs implemented more interest rate (20%), foreign exchange (20%) and reserve policies (15%) and less asset purchases (10%). There were also subtle differences by region. For example, central banks in Latin America engaged proportionately more in foreign exchange operations, and central banks in Eastern Europe, Africa and Asia in interest rate policies.

EMEs found themselves in somewhat uncharted territory, having made less use of new policy tools during the GFC. Nonetheless, they were able to build on, and expand upon, their policy toolboxes, as well as benefit from the experiences of other countries. One contributing factor was that EMEs had adopted flexible policy frameworks that combined inflation targeting with FX intervention, affecting their choice of tools. In addition, growing central bank credibility and better-anchored inflation expectations, the accumulation of FX reserves, greater use of macroprudential policies and the development of local currency bond markets increased policy manoeuvre and strengthened EMEs' resilience to external shocks (BIS (2020)). Table 1 summarises the measures implemented by each central bank, by category.

3.1 Providing accommodation: interest rate reductions and reserve policy

Following the outburst of Covid-19, the first measure for many central banks was a reduction of policy rates to ease funding costs and support aggregate demand. Except in Japan and the euro area, where they were already negative, rates were cut and in many AEs they quickly approached zero (Graph 4, left-hand panel).

EMEs cut rates quickly, in many cases to historic minimums. For example, the Central Bank of Turkey cut rates by 300 bp, the largest interest rate reduction in all countries. The central banks of Brazil, Mexico, Peru and South Africa reduced rates by more than 200 bp, and those of Chile, Colombia, the Czech Republic, Hong Kong, Israel, India, the Philippines, Poland, Russia, Singapore, United Arab Emirates and Vietnam by more than 100 bp. The interest rate policy response in EMEs was different from other crisis episodes. Previously, central banks' desires to cut rates were tempered by the concerns about capital outflows if the exchange rate depreciated. As a result, it was common to see EME policy rates increase during crises. By contrast, during the Covid-19 crisis EME central banks were able to follow AE central banks and cut interest rates. Two factors were at play. First, the cyclical position of EMEs gave more room for easing of monetary policy, while structural changes improved the anchoring of inflation expectations and kept a lid on exchange rate pass-through. Second, the swift monetary policy easing by the Federal Reserve and other AE central banks calmed global financial conditions. These policies capped the appreciation pressures on the US dollar, an EME risk factor, and gave EMEs greater room to cut interest rates (Aguilar and Cantú (2020)).

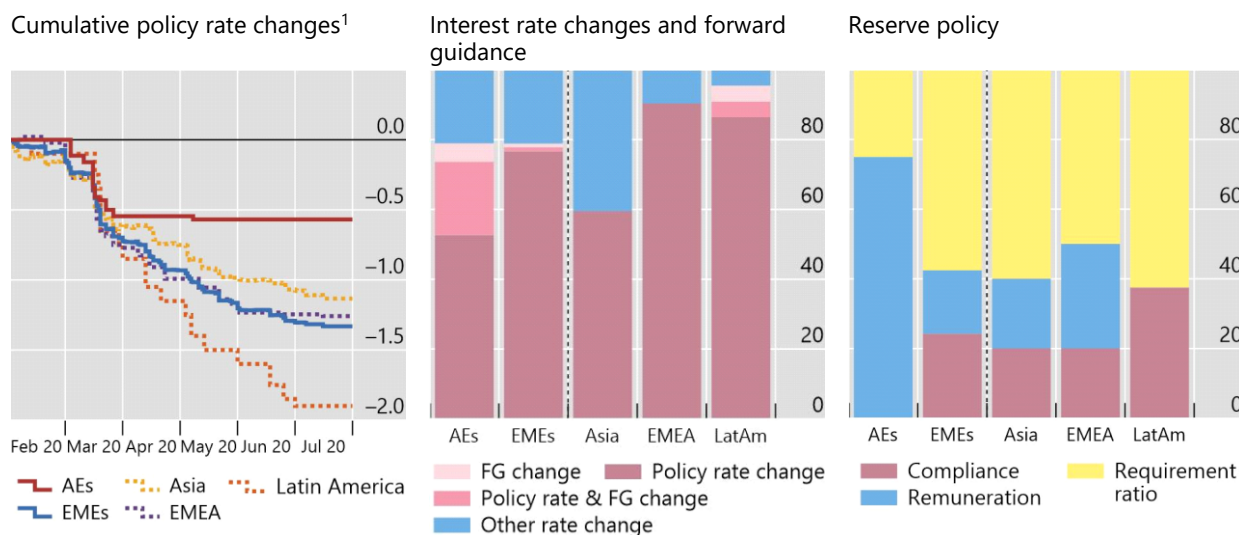
As rates approached zero, AE central banks complemented policy rate cuts with forward guidance to signal that rates would stay low for an extended period. Central banks introduced different language to signal a prolonged period of accommodative stance in around 30% of their interest rate changes (Graph 4, centre panel). In other cases, central banks modified their forward guidance without any change in the policy rate (5% of interest policy announcements). In EMEs, the Central Banks of Brazil and Chile also introduced forward guidance in their policy statements. Brazil

was a special case. The monetary policy committee chose to change their forward guidance statements in three occasions without reducing their policy rate despite having room to cut (the minimum policy rate reached was 2%). One possible reason is that the central bank did not want to risk a sharp currency depreciation or capital outflows by reducing the interest rate further.

Differences in policy response in advanced economies and emerging markets

In per cent; February to July 2020

Graph 4



¹ Simple average of interest rate changes by regions. AR is excluded.

Source: Central bank websites; national data; BIS calculations.

With low policy rates, central banks also implemented changes in reserve policy to quickly free up liquidity to financial institutions (Graph 4, right-hand panel). We classify reserve policy into three categories: compliance, remuneration and requirement ratio. For AEs only three countries (AU, CH and US) implemented changes to their reserve policy and most of those measures involved changes in remuneration.

The use of reserve policy in EMEs was more widespread. In most cases, it involved changes in requirement ratios. Liquidity quickly injected into the system was considerable. For example, the Central Bank of Brazil injected around BRL 68 bn (USD 12 bn) by reducing reserve requirements on time deposits from 25% to 17%. In other cases, the reduction in reserve requirements was subject to restrictions. China reduced required reserves by as much as 200bp, conditional on banks meeting inclusive finance objectives, and for rural banks supporting smaller borrowers. Some other countries adjusted the remuneration of their reserve policy. For example, the Central Bank of the Republic of Turkey lowered remuneration rates on required reserves in liras from 10% to 0% but only for some banks. Finally, some countries announced measures related to compliance, ie changes on instruments that count as reserves. For example, the Central Bank of Argentina allowed the use of central bank debt instruments, the Bangko Sentral ng Pilipinas allowed the use of loans granted to SMEs and the Central Bank of Malaysia allowed government bonds.

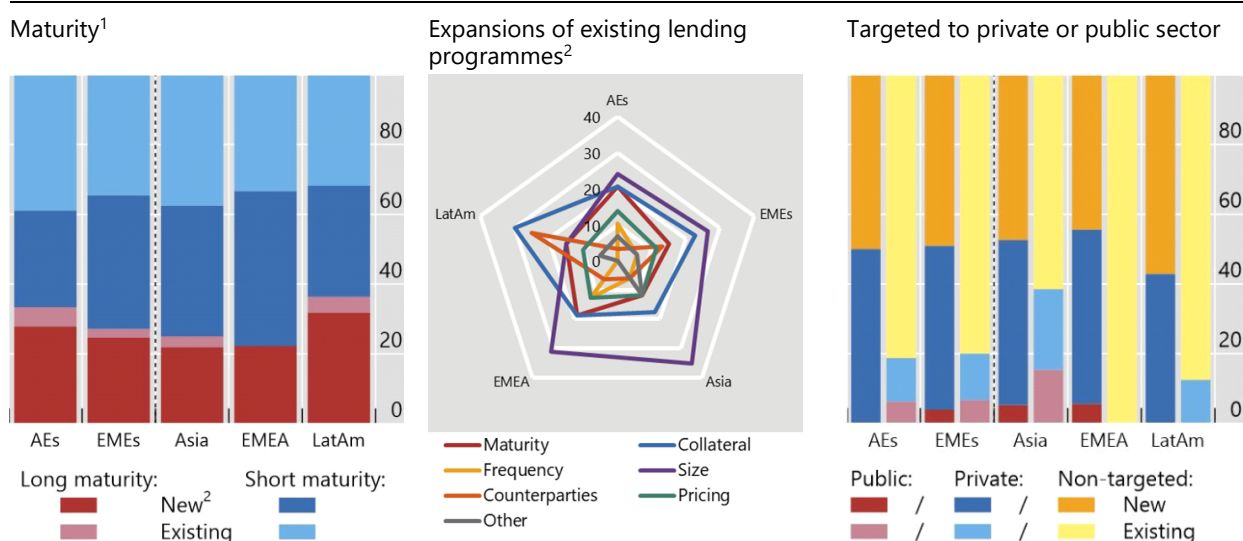
3.2 Liquidity assistance and credit provision: lending operations

The core component of the crisis response was the deployment of a wide-range of balance sheet policies. In both AEs and EMEs around 60% of lending operations policies entailed newly established programmes, rather than continuation of previous ones (Graph 5, left-hand panel). More than half of these programmes, whether new or existing, had a short-term maturity (one year or less). Regarding existing programmes, central banks expanded their lending operations mainly in terms of size of the facilities, eligible collateral and the maturity of the instruments (Graph 5, centre panel). We provide examples of policies implemented in different regions to illustrate the changes and operational framework. These examples are not exhaustive.

Lending operations

In per cent; February to July 2020

Graph 5



¹ Long = Over one year; short = up to 12 months. Lending programmes offering both long and short maturity instruments are classified as long maturity for the purposes of this panel. ² Expressed as a share of all expansions to programmes active pre-crisis, a single programme can be adjusted in multiple dimensions.

Source: Central bank websites; national data; BIS calculations.

In AEs, central banks established non-targeted lending operations in the first months of the pandemic to address liquidity shortages and to prevent market freezes. The Federal Reserve, the Bank of Canada and the Bank of Japan increased the amount of repurchase agreements offered and lengthened their maturities. The Fed also announced lending programmes that were targeted to specific financial market segments. For instance, it intervened to prevent funding strains for primary dealers, by lending against investment grade debt, and for money market mutual funds, by lending to depository institutions against assets purchased from those funds. It also reactivated the Term Asset-Backed Securities Loan Facility (TALF) – first established in late 2008 – to support the issuance of asset-backed securities. The ECB de-facto changed the maturity of existing loans by providing banks with bridge liquidity operations until the June allotment of the Targeted Long-Term Refinancing Operation (TLTRO III). It later established additional Pandemic Emergency Longer-Term Refinancing Operations (PELTRO). The Bank of England and the Bank of Canada activated their Contingent Term Repo Facilities (CTRFs) for the first time since their establishment, in 2014 and 2015 respectively, and lengthened the maturity of the lending operations with repos of up to two years' maturity.

In EMEs, central banks expanded their existing liquidity facilities by lowering rates, broadening eligible collateral and increasing eligible counterparties. In Latin America, the Central Bank of Brazil reduced the spread of the liquidity-levelling window. The Central Bank of Chile included corporate bonds as eligible collateral for its liquidity facilities. It also reinstated a term liquidity facility (FCIC) previously used during the GFC but with greater scope and scale and activated an additional liquidity credit line. The Central Bank of Colombia extended access to repo auctions and its liquidity window to pension funds, several funds managers and national savings funds. The central bank also extended the maturities of repo auctions to 90 days for corporate debt and up to 60 days for public debt. The Bank of Mexico reduced the rate of its Ordinary Liquidity Facility (FLAO) from 2.2 to 1.1 times the policy rate, extended eligible collateral and granted development banks access to the facility.

In emerging Asia, the Bank of Korea adopted unlimited fixed rate 91-day repo operations and expanded the scope of eligible collateral and the range of institutions eligible for borrowing funds through reverse repo transactions. The central banks of China, Indonesia and Malaysia increased non-targeted liquidity injections using reverse repos. The Reserve Bank of India eased commercial banks' overnight borrowing limits under its marginal standing facility and, along with the Bank of Thailand, instituted measures to support the liquidity needs of mutual funds. The maturity of liquidity operations was increased in Indonesia to one year, while the Reserve Bank of India targeted some three-year repo operations to alleviate the pressures on non-banking finance companies and micro finance institutions.

In Eastern Europe, the Czech National Bank allowed insurance companies and pension funds to participate in their repo operations. The repos also increased in frequency, had a longer maturity and allowed the use of mortgage bonds as collateral. The Magyar Nemzeti Bank and the Bank of Israel expanded eligible collateral to include corporate loans.

One main difference between existing and new lending policies was that a large share of new policies targeted the private sector (Graph 5, right-hand panel). Central banks in AEs deployed long-term lending measures to support the flow of credit to households and non-financial corporations. The Federal Reserve, the Bank of Japan and the Bank of England established targeted lending programmes designed to provide funds to banks at favourable terms, conditional on loan extensions to small and medium-sized enterprises (SMEs). The Federal Reserve established the Paycheck Protection Program Liquidity Facility (PPPLF) to provide liquidity against payroll loans guaranteed by the Treasury. The Federal Reserve covered the last mile to reach SMEs during the Covid-19 crisis with the Main Street Lending Program, which provided four-year loans to firms that were in good financial standing before the crisis.

Latin American central banks also implemented several programmes that channelled credit to SMEs. In most cases, these programmes resulted from the collaboration of the central bank and the ministry of finance. For example, the Central Bank of Brazil managed an emergency funding line that helped firms cover wages and other expenses. The government contributed 85%, while banks covered the remaining 15%. In Peru, the government approved a national government guarantee programme (Reactiva Peru) through which financial institutions could use their credit portfolio to obtain a guarantee and carry out repo operations with the central bank. Finally, Bank of Mexico created two distinct facilities to provide financing to SMEs. The distinction was that one of them allowed financial institutions to use as collateral credits to non-financial corporates with high credit rating.

In Eastern Europe and Africa, lending operations to the private sector had different forms. The Hungarian National Bank introduced a long-term collateralised lending facility of unlimited total amount at fixed interest rates. The Bank of Israel provided banks with loans at a fixed interest rate of negative 0.1 percent, against loans that banks extend to SMEs, provided that the interest rate on the loans do not exceed +1.3 per cent the prime rate. The South African Reserve Bank allowed

businesses with an annual turnover of less than R300 million to apply for a guaranteed loan. Firms could use these funds for operational expenses such as salaries, rent and lease agreements, and contracts with suppliers.

Measures to channel credit to SMEs were also common in Asia. The Bank of Thailand provided “soft loans” via banks to SMEs, with the government partially compensating banks for losses and subsidising interest payment for the first six months. In China, re-lending and re-discounting facilities were expanded to support, at low interest rates, manufacturers of medical supplies, micro-, small- and medium-sized enterprises (MSMEs) producing daily necessities, and the agricultural sector. Meanwhile China’s policy banks increased credit to support private, micro and small enterprises with preferential interest rates. And the Monetary Authority of Singapore launched a Singapore dollar liquidity facility to support lending by financial institutions to SMEs under the government’s loan guarantee schemes, to ease credit conditions for such companies, while Korea and Malaysia also increased the size of existing facilities targeting SMEs, and lowered interest rates applied to these facilities.

Finally, some central banks in emerging Asia reduced the issuance of some debt instruments to increase market liquidity. In Thailand and Hong Kong, the issuance of Bank of Thailand Bonds and Exchange Fund Bills fell respectively, and the Monetary Authority of Singapore altered their daily money market operations to ensure that more liquidity remained in the banking system. Meanwhile, Bangko Sentral ng Pilipinas temporarily suspended term deposit facility auctions for certain tenors, and lowered the interest rate spread on its rediscounting facilities to zero, regardless of loan maturity.

3.4 Market functioning: asset purchases and bond swaps

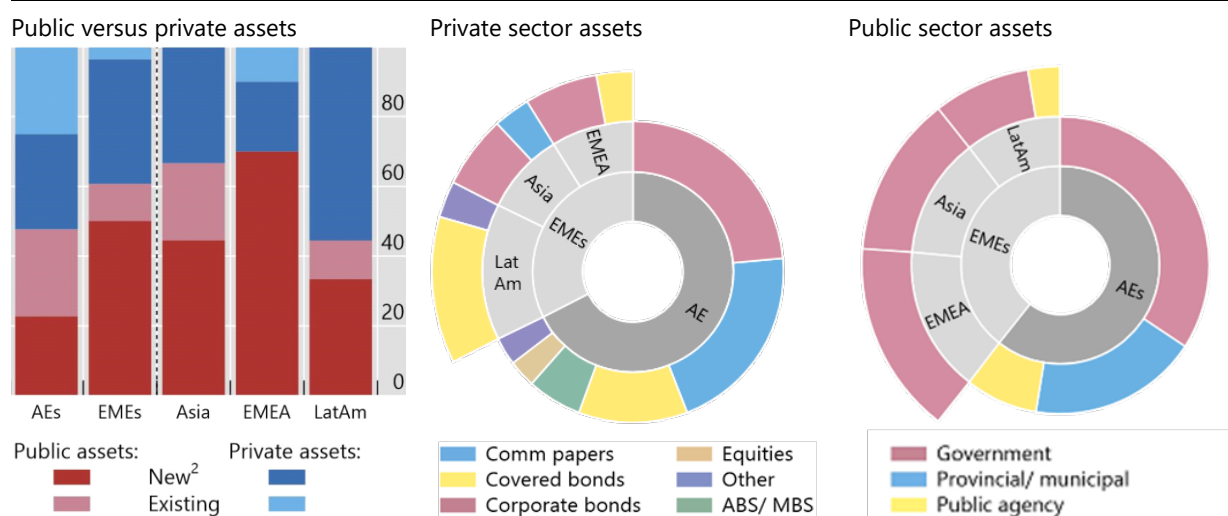
Another class of policy response pursued equally by central banks in EMEs and AEs was asset purchase programmes, although they were intended for different goals in the different groups of countries. For AEs, asset purchase programmes played a key role – perhaps of equal importance to the funding and liquidity provision policies outlined above – in the crisis management phase. In EMEs their role appears to have been more limited (Arslan et al (2020)). In AEs, only 40% of asset purchases programmes were new while in EMEs the share of new programmes was over 90% (Graph 6, left-hand panel). One common characteristic across regions was that asset purchase programmes largely involved long-term instruments (more than 70% of all policies). In AEs, existing programmes were expanded mainly in size but to a lesser extent also in terms of frequency and type of assets purchased. In EMEs, only two programmes existed before the current crisis: the Hungarian bond funding for growth scheme programme and the Colombian government securities swap programme.

Private asset purchase programmes accounted for half the total. In AEs, central banks activated those programmes to directly support the flow of credit to non-financial firms. Most programmes involved either commercial paper or corporate bonds (Graph 6, centre panel). Other types of assets included were covered bonds, equities and asset-backed or mortgage-backed securities. All five largest AE central banks established or increased the size of their commercial paper and corporate bond purchase programmes, while the ECB extended eligibility to nonfinancial commercial paper. The Federal Reserve purchased investment grade bonds for the first time and later extended eligibility to subsequently downgraded bonds – the so-called “fallen angels” – either directly or through exchange-traded funds (ETFs). The ECB likewise extended eligibility to downgraded bonds against appropriate haircuts. The Bank of Japan quadrupled its purchases of commercial paper (CP) and corporate bonds (CBs), while the Bank of England announced that at least 10% of the GBP 200 billion of additional purchases under its Asset Purchase Facility (APF) would involve corporate bonds.

Asset purchases: by type of asset¹

Per cent, February to July 2020

Graph 6



¹ For the purposes of this graph any asset purchases announcement that includes more than one asset class is treated as a separate announcement. ² Programmes first introduced as a response to the Covid episode in 2020.

Source: Central bank websites; national data; BIS calculations.

For EMEs, asset purchase programmes were new territory, hence there was less variety in the type of assets. In Latin America, only Chile and Colombia engaged in private sector asset purchase programmes, and these were restricted to commercial bank bonds. In Chile, the programme amounted up to USD 8 bn and in Colombia up to COP 4 trn (USD 1 bn). In Chile, the central bank implemented two additional asset purchase programmes to reduce the financial effects of a reform that allowed withdrawals from pension funds. The first programme involved the spot purchase and forward sale of bank bonds while the second was a bank deposit purchase programme. In Emerging Asia, the Bank of Thailand stepped in to stabilise corporate bond markets with its Corporate Bond Stabilisation Fund, which provided bridge financing to firms by purchasing investment-grade bonds maturing during 2020–21 at penalty rates. The Magyar Nemzeti Bank launched a mortgage bond purchase programme and expanded the Bond Funding for Growth Scheme. Finally, the Bank of Israel established a corporate bonds purchase programme.

The other half of asset purchase programmes involved government assets. In addition to government bonds, central banks expanded their purchases to include public agency assets, provincial and municipal bonds (Graph 6, right-hand panel). In the United States, public sector asset purchases were instrumental in ensuring a smooth functioning of the US Treasury market and preserving its key role in the pricing of financial assets. Similarly, ECB purchases helped preserve the effective transmission of monetary policy by containing the widening of euro area sovereign spreads. An additional purpose of purchase programmes was to restore confidence and set the conditions for a quick rebound of aggregate demand at the end of the lockdown. The Federal Reserve and Bank of Japan announced unlimited purchases of government bonds, while the Bank of Canada entered an asset purchase programme for the first time, specifying a lower bound of CAD 5 billion for purchases per week. The ECB expanded the ongoing Asset Purchase Programme (APP) by committing to purchase an additional EUR 120 billion in private and public assets by end-2020. Later, it allocated EUR 1.35 trillion to private and public asset purchases under the newly established Pandemic Emergency Purchase Programme (PEPP). The Federal Reserve and the Bank of Canada established purchase programmes for assets issued by municipal entities and local public authorities for the first time.

In Asia, Eastern Europe and Africa, central banks actively bought government bonds. The central banks of India, Korea, the Philippines and Thailand purchased government securities outright in the secondary market, while Bank Indonesia purchased bonds in the primary market to support government measures for mitigating the pandemic and to boost the economic recovery. The central banks of Hungary, Israel, Poland, Romania and South Africa purchased government securities in secondary markets to restore their liquidity and strengthening the monetary policy transmission mechanism. In Turkey, primary dealer banks were able to sell government securities to the central bank.

EME central banks in Latin America were generally cautious about implementing public debt purchase programmes. In the past, central banks financing government debt had led to long periods of uncontrollable hyperinflation. Only Colombia purchased public debt in the secondary market (up to COP 2 trn, or USD 500 mn). The Central Bank of Brazil and the Central Bank of Chile requested legal amendments from their respective legislative branches to enable them to purchase public bonds but neither central bank used this policy in the period considered. That said, the central banks of Brazil, Colombia and Mexico undertook twist-type transactions, absorbing duration from the market by buying long-term securities and selling short-term ones. Finally, Chile implemented a special asset purchase programme that involved Central Bank of Chile bonds.

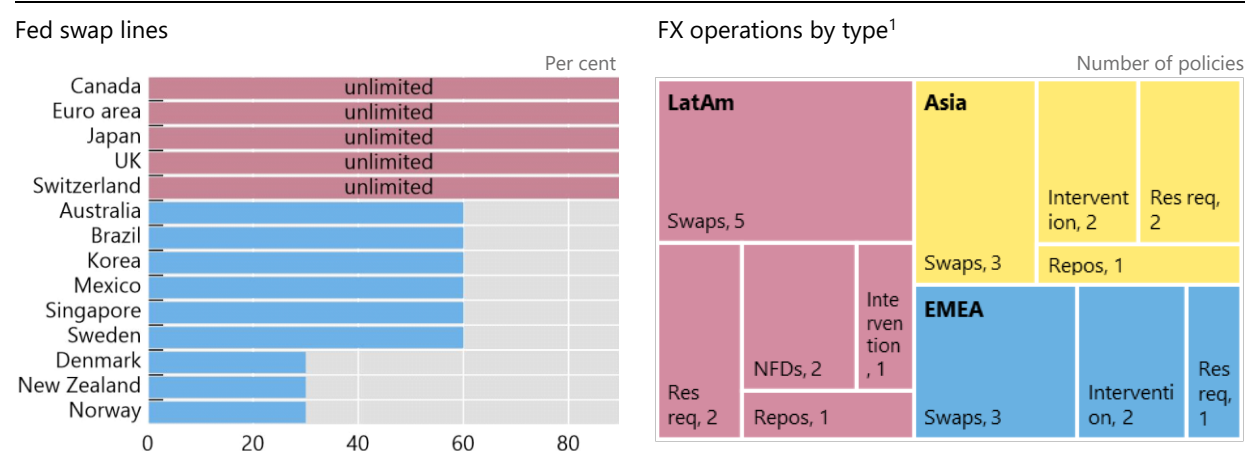
3.5 Liquidity and funding in USD: foreign exchange operations

Foreign exchange liquidity measures played a key role in alleviating strains in foreign currency markets. Increasing dollar liabilities, combined with an appreciating US dollar, left the market for dollar funding under tight pressure (Avdjiev et al (2020)). The Federal Reserve responded by reducing the cost and extending the maturity of standing swap lines with five central banks. Later, it reopened swap lines with nine other countries that were previously activated during the GFC (Graph 7, left-hand panel). A complementary measure that increased the availability of US dollars for economies without access to swap lines, while providing a backstop to the US Treasury sell-off, was the FIMA Repo Facility, where foreign and international monetary authorities could obtain dollars by pledging US Treasuries as collateral. Authorities in Korea, Mexico and Singapore drew down on swap lines with the US Federal Reserve, while the Hong Kong Monetary Authority made use of the Federal Reserve's FIMA Repo Facility to ensure liquidity.

Foreign exchange

February to July 2020

Graph 7



Source: Central bank websites; national data; BIS calculations.

The use of FX intervention instruments was more varied in EMEs (Graph 7, right-hand panel). During the Covid-19 crisis, EME central banks intervened in FX markets to improve liquidity and limit exchange rate volatility. The increased demand for USD funding, a lack of sufficient FX hedges and the liquidation of portfolio positions by foreign investors all led to high volatility in FX markets. These conditions created an adverse feedback mechanism between capital flows, exchange rates and bond prices. Financial risks related to exchange rate volatility became even stronger as firms had to fulfil international debt service payments while their USD income declined. Most banks and firms were somewhat hedged by FX derivatives, but not sufficiently to fully cover the sharp depreciation.

In Latin America, the preferred instruments for FX intervention were FX derivatives. The central banks of Brazil, Chile, Colombia and Peru expanded their FX swap programmes, while the central banks of Chile, Colombia and Mexico engaged in operations using non-deliverable forwards. In both cases, the objective was to provide market participants with exchange rate hedges to reduce their exposure to currency risk. In Emerging Asia, many central banks also intervened in FX markets in order to mitigate potentially destabilising exchange rate dynamics. In the case of Indonesia, the central bank intervened in FX spot and domestic non-deliverable forwards markets. The Central Bank of Malaysia employed targeted FX intervention to mitigate excessive exchange rate volatility and ensure sufficient FX liquidity, while the Bank of Thailand used “verbal and two-sided FX intervention” to cope with excessive FX movements. Meanwhile the Monetary Authority of Singapore announced a re-centring of the exchange rate band with a zero percent appreciation rate, assessing that the equilibrium level of the real exchange rate had dropped due to the Covid-19 outbreak. By contrast, Hong Kong faced the opposite problem: interventions were automatically triggered under their Linked Exchange Rate System when the value of the Hong Kong dollar appreciated to the strong side of the target range of 7.75-7.85 HKD per USD.

Additional measures were also undertaken by some central banks to ensure sufficient dollar liquidity. The Reserve Bank of India provided sell/buy swaps via auctions, while Bank Indonesia increased the frequency of FX swap auctions for 1-, 3-, 6- and 12-month tenors from three times per week to daily. The European Central Bank and the central banks of Hungary and Romania agreed to set up a repo line arrangement to provide euro liquidity to domestic financial institutions. The Central Bank of the Republic of Turkey and Qatar Central Bank arranged a swap line with a value of USD 15 bn.

4. Conclusions

The Covid-19 pandemic was a global shock that simultaneously affected demand, supply and financial conditions. Central banks responded with scale and speed to stabilise financial markets and cushion the contraction in real activity.

This paper introduces a novel database that provides information on central banks’ responses to Covid-19 in 39 economies around the world. We describe the database and illustrate how it can be used to study central bank responses to this once-in-a-lifetime event. We characterise how central banks reacted across different countries, in terms of their timing and choice of tools, comparing the major AEs and various groupings of EMEs.

The database on central banks’ response to Covid-19 can be useful to researchers who wish to examine this period more closely, and serves as a convenient starting point for further research into this instructive episode.

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Appendix

A. The database

Link

https://www.bis.org/publ/work934_data.xlsx

General purpose

The database provides information on monetary policy measures undertaken by major central banks around the world in response to the outbreak of the Covid-19 pandemic.

Coverage

The database covers the announcements of 39 central banks. More specifically, the sample includes central banks of 11 AEs (AU, CA, CH, DK, EA, GB, JP, NO, NZ, SE and US) and 28 EMEs (AE, AR, BR, CL, CN, CO, CZ, DZ, HU, HK, ID, IL, IN, KR, KW, MA, MX, MY, PE, PH, PL, RO, SA, SG, TH, TR, VN and ZA).

Time span

The time span varies across central banks. For each economy, the starting point is the first announcement explicitly mentioning the word "Covid-19."

Description

The information is summarised in seven spreadsheets, which are described in detail below.

1. Central banks

The spreadsheet contains the list of central banks included in the sample and their information. It is structured as follows.

- IFS cc: International Financial Statistics country code.
- Country: ISO 3166 alpha-2 country code.
- Jurisdiction: name of the country or of the monetary area.
- Central bank: name of the central bank.
- Last updated: date of the most recent update.
- Website 1: central bank's webpage where the announcements are posted (primary).
- Website 2: central bank's webpage where the announcements are posted (secondary).
- Website 3: central bank's webpage where the announcements are posted (tertiary).

2. Announcements

The spreadsheet contains the list of individual announcements, defined as a set of information communicated by a central bank regarding one of its monetary policy tools on a specific date. Each

announcement is uniquely identified by the combination of three attributes: economy, tool, and date. This implies that the information contained in a single press release can give rise to multiple announcements, one for each of the monetary policy tools involved. This structure allows the user to connect each announcement with the relevant tool in the specific sheets, and vice versa, to recover the sequence of announcements regarding a particular tool. The spreadsheet contains the following information.

- ID: identifier code associated with a specific monetary policy tool of a central bank. Each ID is both tool- and country-specific, such that the policy rate decisions of different central banks are associated with different IDs.
- Sequential: sequential number of the announcement for each tool.
- Date: date of the announcement.
- Time: time of the announcement.
- Country: ISO 3166 alpha-2 country code.
- Policy: type of policy of the announced tool (interest rate decisions, reserve policies, lending operations, asset purchases, and foreign exchange policies).
- Announcement: short summary of the measure announced.
- Rollback: dummy variables that takes value 1 if the announcement involves the rollback of a previously announced measure.
- Comments: additional comments.
- Source: link to the source of the information.

3. Interest rates

The spreadsheet contains all policy rate decisions as well as decisions related to other relevant interest rates, if set independently from the policy rate. The spreadsheet is structured as follows.

- ID: unique identifier code.
- Country: ISO 3166 alpha-2 country code.
- Date: date of the announcement.
- Interest rate: name of the interest rate.
- Change: change in the interest rate (in percentage points).
- Target: announced target for the interest rate (in percentage points).
- Forward guidance: forward guidance statement.
- Additional notes: additional details of the decision.

4. Reserve policies

This spreadsheet collects all decisions involving central bank reserves such as their requirements and their remuneration. For each tool, it contains the following information.

- ID: unique identifier code.
- Country: ISO 3166 alpha-2 country code.
- Date: date of the announcement.
- Type of policy: type of reserve policy measure (requirement ratio, remuneration, compliance).
- Announcement: short summary of the measure announced.

5. Lending operations

This spreadsheet collects all tools involving central banks' lending operations to the private and public sector. For each tool, it provides the following information.

- ID: unique identifier code.
- Country: ISO 3166 alpha-2 country code.
- Tool: name of the tool.
- Acronym: acronym of the tool.
- First announcement date: date of first announcement involving the tool.
- Start date: starting date of the measure contained in the first announcement.
- End date: end date of all measures announced.
- Maturity: maturity of the lending operation.
 - Short: maturity of less than 12 months.
 - Long: maturity of 12 or more months.
- Size: announced size of the tool (min or max).
- Fiscal backing: information about the involvement of the fiscal authority in absorbing/sharing the credit risk of the operation.
- Link to lending: dummy variable that takes value 1 if access to (or cost of) the tool is linked to the counterparty's lending pattern to the non-financial private sector.
- Public sector: dummy variable that takes value 1 if the central bank is lending directly to the public sector.
- Inactive pre-crisis: dummy variable that takes value 1 if the tool was not active before the Covid-19 crisis. This includes also tools that were used in the past but were inactive at the outbreak of the pandemic.
- Active pre-crisis: dummy variables for the attributes that were changed in response to the crisis for those tools that were already active before the Covid-19 crisis.
 - Maturity: longer maturity.
 - Collateral: larger set of collateral.
 - Frequency: higher frequency of the operations.
 - Counterparties: larger set of counterparties.
 - Pricing: reduced cost.
 - Other: other changes.
- Additional notes: additional details.

6. Asset purchases

This spreadsheet contains all tools involving central banks' outright purchase of assets and swap operations. For each tool, it provides the following information.

- ID: unique identifier code.
- Country: ISO 3166 alpha-2 country code.
- Tool: name of the tool.
- Acronym: acronym of the tool.
- First announcement date: date of first announcement involving the tool.
- Start date: starting date of the measure contained in the first announcement.
- End date: end date of all measures announced.
- Maturity: maturity of the assets purchase by the central bank.
 - Short: maturity of less than 12 months.
 - Long: maturity of 12 or more months.
- Size: announced size of the tool (min or max).
- Fiscal backing: information about the involvement of the fiscal authority in absorbing/sharing the credit risk of the operation.
- Public assets: dummy variables for the type of public sector assets purchased.

- Government debt: liabilities of the federal government.
 - Provincial/municipal debt: liabilities of the local government.
 - Public agency debt: liabilities of government-sponsored enterprises.
- Private assets: dummy variables for the type of private sector assets purchased.
 - Commercial papers.
 - Covered bonds: include bank bonds.
 - ABSs/MBSs: asset- and mortgage-backed securities.
 - Corporate bonds.
 - Equities: including equity traded funds.
 - Others: other private sector liabilities.
- Inactive pre-crisis: dummy variable that takes value 1 if the tool was not active before the Covid-19 crisis. This includes also tools that were used in the past but were inactive at the outbreak of the pandemic.
- Active pre-crisis: dummy variables for the attributes that were changed in response to the crisis for those tools that were already active before the Covid-19 crisis.
 - Maturity: longer maturity of the assets purchased.
 - Assets: wider set of assets purchased.
 - Frequency: higher frequency of the operations.
 - Size: increase in the amount of purchases.
 - Counterparties: larger set of counterparties.
 - Other: other changes.
- Additional notes: additional details.

7. Foreign exchange

This spreadsheet contains all tools involving foreign currencies and/or foreign entities. For each tool, it provides the following information.

- ID: unique identifier code.
- Country: ISO 3166 alpha-2 country code.
- Type of policy: type of foreign exchange policy (FX intervention, FX repo, FX reserve requirements, FX swaps, IMF programme, Non-deliverable forwards, Swap line, other).
- Tool: name of the tool.
- First announcement date: date of first announcement involving the tool.
- Start date: starting date of the measure contained in the first announcement.
- End date: end date of all measures announced.
- Maturity: maturity of the operation.
 - Short: maturity of less than 12 months.
 - Long: maturity of 12 or more months.
- Size: announced size of the tool (min or max).
- Inactive pre-crisis: dummy variable that takes value 1 if the tool was not active before the Covid-19 crisis. This includes also tools that were used in the past but were inactive at the outbreak of the pandemic.
- Active pre-crisis: dummy variables for the attributes that were changed in response to the crisis for those tools that were already active before the Covid-19 crisis.
 - Maturity: longer maturity.
 - Collateral: larger set of collateral.
 - Frequency: higher frequency of the operations.
 - Counterparties: larger set of counterparties.

- Pricing: reduced cost.
- Other: other changes.

B. A companion dashboard

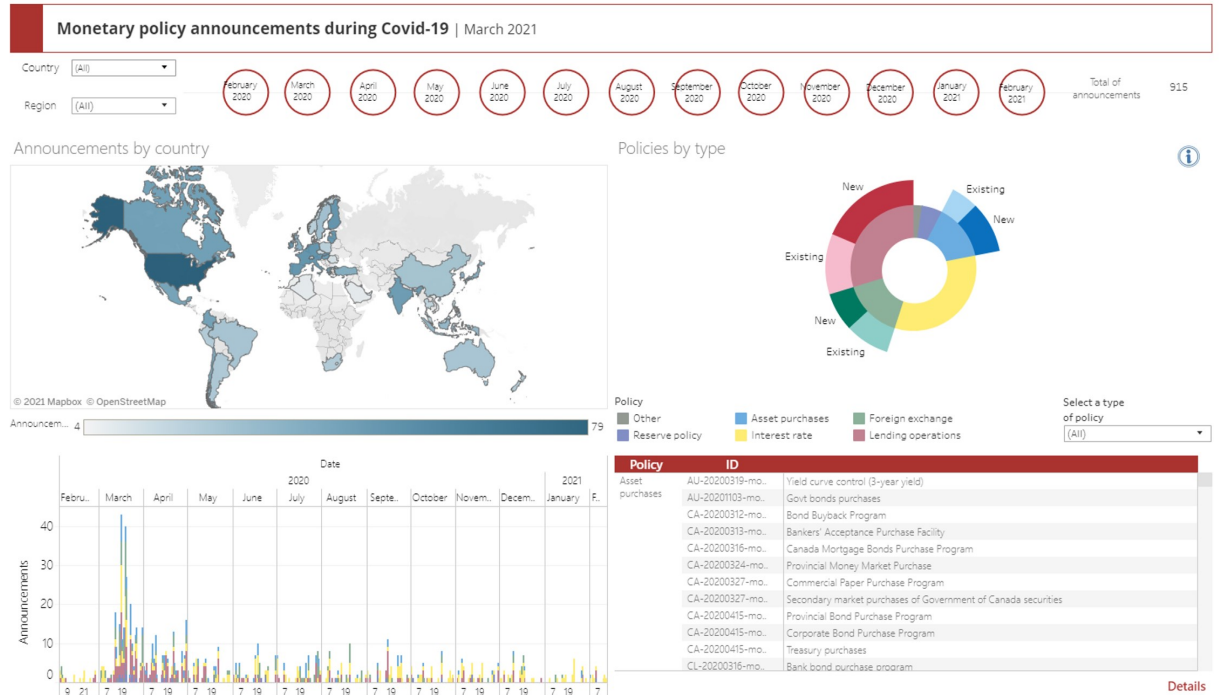
The database's information is graphically explored through a [dashboard](#).⁸ The dashboard has four components (Graph A1). The top-left contains a heat map of the economies included in the database, with colours ranging from yellow (lower number of policy announcements) to red (higher number of announcements). Users can hover the cursor above a country to see the number of policy announcements and tools adopted by the central bank. The top-right shows a sunburst graph with the proportion of policy tools by categories. The second level of the sunburst divides policies into new and existing. The bottom-left panel shows a histogram of the of policy announcements by date. Finally, the bottom-right panel contains a table with the policy tools by ID.

Users can filter the information by clicking on different parts of the dashboard. For example, selecting a country in the map displays only the policies implemented by the central bank in that country.⁹ Alternatively, users can click on the sections of the sunburst graph to filter specific policies or click on a day in the horizontal axis of the histogram to show policies implemented on that day. Finally, users can select a specific policy tool to retrieve the day(s) where the related announcement(s) was (were) made. To remove the filters, either click on the section of the dashboard previously selected again or refresh the webpage.

There are two additional helpful features. First, at the top of the dashboard users can apply a filter for a specific month by clicking on its name. Second, at the bottom right corner users can click on **Details** to obtain detailed information on each policy tool (eg start date, end date, link to lending, type of transaction counterparty fiscal backing, etc). Filters can also be applied to the table. If no filter is selected, the table will report all the information in the database. By contrast, if a policy is selected from the bottom-right of the dashboard, the table will only show the information related to that specific policy.

⁸ Link to dashboard: <https://www.bis.org/publ/work934.htm>

⁹ To return the map to its original position, the user can click on the home symbol of the left side of the map.



Notes: The top left side contains a heat map of the countries included in the database, with colours ranging from yellow (lower number of policy announcements) to red (higher number of announcements). The top right side shows a bar graph with the proportion of policy tools by categories. The bottom left side shows a histogram of the of policy announcements by date. Finally, the bottom right side contains a table with the policy tools by ID.

Source: Central bank websites; national data; BIS calculations.

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