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## How 'Monetization' Really Works — Examples from Three Asian Nations' Responses to Covid-19

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### ABSTRACT

The severe economic downturn caused by the COVID-19 pandemic has forced governments worldwide to increase spending while tax revenues simultaneously collapsed. Concurrent with this, central banks in several of these countries are financing a significant percent of their direct income support through direct lending or purchases of government bonds in primary and/or secondary markets. Many oppose this for their alleged negative consequences on the economy, inflation in particular. This paper describes the actual workings of what most people (including many economists) often call monetization of government debt and its major implication, namely, that it leads to printing money and, consequently, to inflation. We show that the reality is very different: once one knows how modern central banks manage monetary policy (i.e. through a corridor interest rate targeting system), and how they coordinate their daily operations with their Treasuries, monetization does not occur as it is often described, and it is not nearly as dangerous as its critics argue (and not as useful as its supporters claim). The examples of the Philippines, Singapore, and the People's Republic of China clarify this.

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The severe economic downturn caused by the COVID-19 pandemic has forced governments worldwide to increase spending as tax revenues simultaneously collapsed. According to the Asian Development Bank (ADB) COVID-19 Policy Database (<https://covid19policy.adb.org/>), as of February 8, 2021, its 68 members had announced packages that amount to a total of about US \$27,834 billion. US \$3,666 billion corresponds to the announced packages of its 46 developing members. Direct support to income (spending, tax cuts, etc.) is about US \$9,372 billion, of which US \$1,861 billion is from ADB's developing members.

Central banks (CBs) in several of these countries are financing a significant percent of this direct income support through direct lending or purchases of government bonds in primary and/or secondary markets. According to the ADB COVID-19 Policy Database, CB reported financial support of government across all ADB members is US \$3,456 billion (plus nearly US \$400 billion more from the European Central Bank (ECB)), or 37 per cent of the direct income support governments have authorized. CBs in the

developing ADB members account for only about US \$134 billion of this or around 7 per cent of those countries' direct income support (again, as of February 8, 2021). In some instances, the CB's support of the government is a large percent of the government's direct income support. For instance, announced support for the governments of Indonesia and the Philippines by their respective CBs comes to well over 100 per cent of each government's direct income support to the private sector.

Of course, with CB financial support of government there is always controversy about the potential for inflation and/or the threat of fiscal dominance. Less often understood is that governments and their CBs already carrying out operations daily that are inherently interdependent. These operations provide the necessary context for being able to think carefully about how CB financial support of government is occurring now and help clarify where more or less concern is appropriate. In particular, whereas standard thinking has been that CB support of government deficits amounts to 'printing money' and/or 'monetizing government debt,' actual operations and accounting show this not to be the case. Instead, these operations simply replace an interest-earning government liability with an interest earning CB liability, though they obviously also can enable more CB influence over risk-free interest rates in the domestic currency.

The purpose of this paper is to describe 'monetization' through operations and accounting, within the context of three countries' — Philippines, Singapore, and China — experiences during the first half of 2020 in response to COVID. The first section presents three core points for understanding 'monetization' from the operations and accounting in real world CBs. The subsequent three sections each deal with a part of the countries' response to COVID-19 relevant to 'monetization.' In the end, consistent with the use of quotes here around the term, 'monetization' is not what most think it is. Instead, it is not nearly as dangerous as its critics argue, but also not necessarily as useful as its supporters claim or hope. And, without most even knowing it, it is and was already happening, even in normal times.

## Central Bank Operations and Government Debt

Table 1 lists countries (plus the ECB) whose CBs are known to have engaged in some form of support of government debt, separated into those that have engaged in direct lending and/or primary market purchases of government debt,<sup>1</sup> secondary market purchases,<sup>2</sup> and/or secondary market purchases for directly setting rates on government debt along the yield curve either outright or in exchange for sales of short-term government bills ('maturity swaps,' denoted by \* in the table). Some countries' CBs appear in multiple columns: United Kingdom, New Zealand, Indonesia, and the Philippines in columns 1 and 2, and India in columns 1 and 3.<sup>3</sup>

There are three core points to understand about these CB operations to support government. First, CBs set interest rate targets or target ranges, necessarily, because of

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<sup>1</sup>This is exclusive of some CBs normal practice of rolling over their maturing holdings of government debt in primary markets.

<sup>2</sup>This is exclusive of, or in addition to, the normal practice of many CBs that already purchase government debt in secondary markets regularly in order to replenish banks' reserve balances debited as banks purchase physical currency for their customers' withdrawals.

<sup>3</sup>As is clear later in the paper, we would argue that Singapore's actions to draw down national reserves to pay for the COVID-19 fiscal response fits in column 1 of Table 1.

**Table 1** . Central Banks Supporting National Governments in Response to COVID-19.

Direct Loans or Primary Market Purchases (1)	Secondary Market Purchases (2)			Secondary Market Purchases: Yield Curve Control(#) or Maturity Swap(*) (3)
Canada	Bangladesh	Indonesia	Solomon Islands	Australia#
India	Canada	Malaysia	South Korea	India*
Indonesia	Colombia	New Zealand	Sweden	Japan#
New Zealand	European Central Bank	Papa New Guinea	Thailand	Mexico*
Philippines	Fiji	Philippines	Turkey	Suriname*
United Kingdom	Hungary	Poland	United Kingdom	
		Romania	United States	

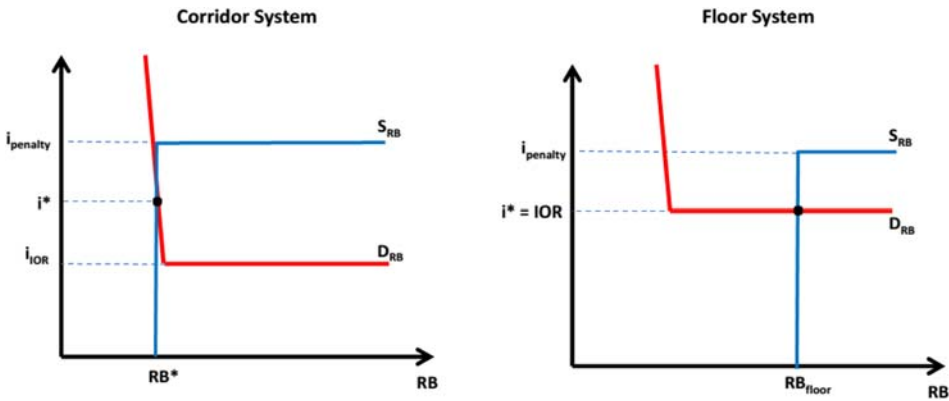
the flexibility in the quantity of CB reserve balances (RBs, which are CB liabilities banks use to settle payments and, where applicable, meet regulatory requirements for liquid balances against their own liabilities) required on a daily basis to ensure functioning of the payments system and stability in wholesale funding markets. This means the CB carries out daily operations using a version of either a corridor or a floor system in achieving its interest rate target, both of which appear in [Figure 1](#) below.<sup>4</sup>

In the corridor system, the CB's 'penalty rate' for borrowing from its standing facility and the rate paid on RBs (IOR — for 'interest on reserves' — or zero for a CB that does not pay IOR) together set a 'corridor' for the market interest rate to fluctuate within. The CB then adds or drains RBs via open market operations, loans, and so on, to shift the vertical portion of the supply of RBs ( $S_{RB}$ ) as it accommodates shifts in banks' demand for RBs at the CB's interest rate target ( $i^*$ ), or to offset changes to its own balance sheet that would otherwise alter the quantity of RBs and move the market rate away from  $i^*$ . In a floor system, the CB simply ensures the  $S_{RB}$  is shifted right to well beyond any projected downward-sloping portion of  $D_{RB}$ . From basic supply and demand analysis, this pushes the price (the market interest rate) to zero. If the CB wants to set its interest rate target above zero it must pay IOR equal to  $i^*$ . Thus, the floor in the floor system is either zero or IOR, which becomes the de facto interest rate target. The quantity of RBs in the corridor system graph is an equilibrium (hence the '\*' in  $RB^*$ ), while any quantity of RBs along the horizontal portion of  $D_{RB}$  achieves the target rate in the floor system.

The second core point is that government spending, tax revenues, and bond sales in the domestic currency all occur on the CB's balance sheet because the government's account is a liability of the CB. From simple double-entry accounting the financial flows into and out of the government's account will have the opposite effect on the quantity of RBs circulating. [Table 2](#) shows the t-account entries for a government deficit and a government bond sale, respectively.<sup>5</sup> Considering [Table 2](#) and [Figure 1](#) together, the deficit raises RBs, placing downward pressure on the market rate in the

<sup>4</sup>CBs can also use a 'ceiling system' in which the target rate and the rate banks borrow from the CB ( $i_{penalty}$  in [Figure 1](#)) are set equal and banks simply borrow all the RBs from the CB. This is the 'overdraft system' discussed in Lavoie (2014, p. 205–209). CBs that target a repurchase agreement (repo) rate instead of an interbank interest rate are in essence running ceiling systems, with banks and/or bond dealers as the counterparties.

<sup>5</sup>In [Table 2](#) and other tables that follow, 'A' = assets, 'L/E' = liabilities and equity, 'Dep' = deposits, 'HH' = households, 'Acct @ CB' = the government's account at the central bank on the government's assets, 'Govt Acct' = the government's account at the central bank on the central bank's liabilities, 'Net Worth' = assets – liabilities.



**Figure 1.** Corridor and Floor Systems for Central Bank Interest Rate Targeting

corridor system, though obviously not in the floor system given the floor’s presence at  $IOR = i^*$ . The bond sale drains RBs and offsets the deficits effect on the quantity of RBs in both systems; in the corridor system, the pressure on the market rate to fall is reversed, while as long as the quantity of RBs in the floor system remains to the right of the downward sloping portion of  $D_{RB}$  throughout there is no effect on the market interest rate.

Even in normal times, the flows to and from the government due to spending, revenues, and bond sales are not perfectly timed. In the United States (US), for instance, prior to the 2008 global financial crisis (GFC) the US Treasury would transfer from or to its account at the Federal Reserve (Fed) to or from accounts it held at thousands of private banks to offset this lack of daily synchronization’s effect on the quantity of RBs, thus largely allowing the Fed to avoid having to offset these flows itself in its own operations (Kelton [Bell] 2000; Tymoigne 2014). Other countries, like China, that use a Treasury Single Account System instead leave these offsetting operations to their CBs to integrate into day-to-day operations for achieving the interest rate target (e.g. He and Jia 2020). A CB using a corridor system will have to offset these flows if they move the market rate away from the CB’s target, either by changing its assets (more or fewer loans or open market operations, for instance) or changing its own non-RB liabilities to counter the flow to and from the government’s account. In a floor system, again the CB simply ensures the quantity of RBs is ‘ample’ such that  $S_{RB}$  is to the right of the downward sloping part of  $D_{RB}$ .

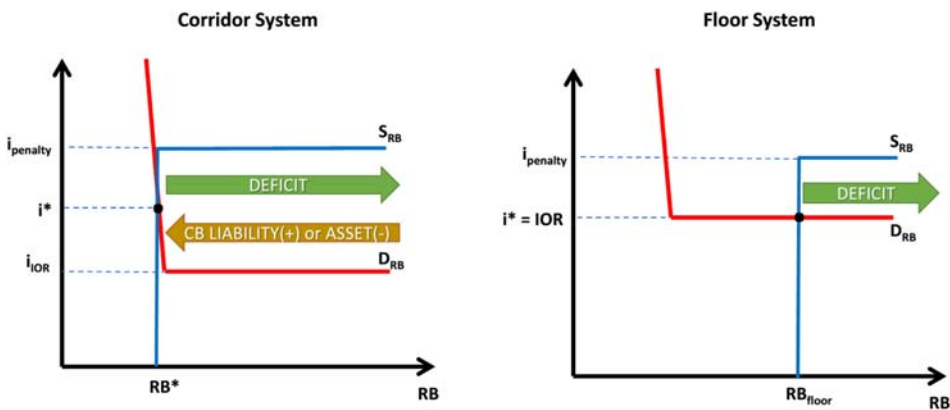
**Table 2.** T-Accounts for Government Deficit and Bond Sale.

	Government		Central Bank		Banks		Dealers		Households	
	A	L/E	A	L/E	A	L/E	A	L/E	A	L/E
(1) Deficit	Acct @ CB (-)	Net Worth (-)	RBs (+) Govt Acct (-)		RBs (+)	HH Dep (+)			Dep (+)	Net Worth (+)
(2) Government bond sale	Acct @ CB (+)	Bonds (+)	RBs (-) Govt Acct (+)		RBs (-)	Dealer Dep (-)	Dep (-) Bonds (+)			

The corollary here is that when CBs finance government, whether directly (primary market or direct loans) or indirectly (secondary market), they cannot do so without sterilizing these operations. Figure 2 shows these operations in the corridor and floor system graphs. Both direct and indirect CB finance shift  $S_{RB}$  right. A CB in a corridor system will need to respond by draining RBs to achieve the target rate, either issuing its own liabilities at a rate similar to its target rate or some combination of reducing its assets via sales or allowing its claims on the private sector to mature and not roll over. In a floor system, the CB responds by paying interest on the additional RB, which become essentially interest-bearing overnight debt issued by the CB earning the CBs target rate. There is no ‘printing money’ or ‘monetization’ because it is not operationally possible in either system.

Lastly, as the CB ends up paying interest on its own liabilities issued in these operations within a floor system, this reduction in its net income will lead to an in-kind reduction in the CBs remittances to the government, reducing the government’s own budget position such that it is effectively servicing the debt itself as if it had issued bonds. It is the standard practice across countries in which CBs remit their profits (or some percent of profits), often legally prescribed, to the government. Remittances arise mostly from interest paid by government to the CB on government liabilities held by the CB, which is in essence returned to the government. In terms of accounting, the remittance is a simple debit from the CB’s equity and credit to the government’s account at the CB. It follows that if the CB pays interest on its own liabilities issued when it acquires government debt in the secondary market or when a government incurs a deficits the CB directly finances, the CB’s profits are reduced in kind and so are its remittances. This is important for understanding government debt operations since it means that when the CB acquires the government’s debt in a floor system the cost of servicing this debt is still effectively borne by the government indirectly through reduced remittances from the CB.

The final core point relates to interest rates on domestic currency government debt being the yield curve for the risk-free rate, which is a benchmark that markets use to price other financial assets. This means that interest rates on government debt are an integral part of the transmission of monetary policy. This is well known in principle, but the implications are usually not. A competitive, highly liquid market for government debt will price the yield curve mostly based on the CB’s current target rate and the



**Figure 2.** Sterilizing Central Bank Support of Government in Corridor and Floor Systems

market's expected path for the CB's target rate. This is because sufficient funding liquidity (that is, ability to finance and refinance asset positions) and market liquidity (ability to buy or sell quickly, in large quantities, without significantly affecting price) in a competitive market bring the returns from holding the government bonds into line (again, mostly) with the borrowing costs of acquiring the funds to purchase them — namely, the current CB target rate and its expected path. Where government debt markets are highly liquid CBs enable this via at least implicit support for market and finance liquidity for achieving their interest rate targets (or target ranges), especially (or necessarily) where CBs' operations occur with a network of government bond dealers.

This suggests there are primarily two reasons for a CB to support government liabilities:

- (i) to reduce the yield curve (or portions of it) below market expectations of the path of the CB's target rate, and/or
- (ii) to support market functioning where liquidity is insufficient, perhaps temporarily impaired by a systemic 'shock,' without which monetary policy will not transmit through financial markets or will transmit perversely.

Representative examples of (i) are the 'yield curve control' (YCC) operations of the Bank of Japan (BoJ) since 2016 and the Fed's quantitative easing (QE) operations during 2010–2015. The BoJ's YCC operations target explicit, very low interest rates across the yield curve. The Fed's QE operations during the first half of the 2010s had a similar purpose, but via an announced quantity of bond purchases rather than an announced desired interest rate for any maturity. In both cases, the CBs' operations occurred within floor systems and the RBs created by these operations earn interest; the two CBs have different frameworks for this, with RBs of banks earning 0.25 per cent at the Fed and excess RBs (beyond those necessary to meet reserve requirements) earning negative rates at the BoJ since 2016.

In the course of responding to COVID-19, at least initially many CBs intervened to support government bond markets due to (ii), including the Fed in March 2020,<sup>6</sup> which came only six months after it intervened to provide funding liquidity to government bond dealers in September 2019 and had continued to support government bond markets thereafter through treasury bill purchases. This reduction in bond market liquidity in rich countries, like the United Kingdom and Canada, as well as emerging market countries like Indonesia and the Philippines, prompting an active response from their CBs — now termed 'market functioning' operations, in order to differentiate operations related to reason (i) like QE and YCC — even beyond that of 2008–2009. To be clear, neither (i) nor (ii) are inherently tied to YCC, QE, or whatever strategies CBs might pursue. Pursuing operations related to (ii), the Fed's approach was similar to rounds of QE in previous years when it did not announce target rates across the yield curve, while the Reserve Bank of Australia did directly set a rate for the benchmark 3-year government bond.

The next section discusses events as they occurred in the Philippines in March 2020 within the context of the three core points in this section.

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<sup>6</sup>See Fleming (2020), Duffie (2020), and Logan (2020) for discussion. In the Fed's case its own liquidity and capital regulations contributed to continuing liquidity issues, as Pozsar (2019a, 2019b) had warned earlier, that worsened in the COVID-19 crisis (Tankus 2020).



## The Philippines' Bangko Sentral ng Pilipinas and Failed Treasury Auctions in March

The events of March and April related to liquidity issues in government bond markets were particularly interesting in the Philippines. The Philippines' Bureau of the Treasury (BTr) experienced failed auctions throughout the second half of March (although 'failed' here does not mean there were no buyers; in fact most of the auctions were least almost fully subscribed, though it has not been uncommon for BTr to reject bids it deemed to high). The Philippines' CB, Bangko Sentral ng Pilipinas (BSP), responded with the following series of actions:

- 17 March — Canceled its Term Deposit Facility (TDF) auctions that drain RBs to achieve the target rate so that these would not compete with BTr's auctions.
- 23 March — Authorized a PHP 300 billion repurchase agreement with BTr with a maturity of three months, which BSP could extend for three more months at the due date.
- 24 March — Increased interventions in the secondary government bond market with a new daily one-hour facility to buy select BTr securities.
- 26 March — Remits PHP 20 billion advanced dividend to BTr
- 8 April — Increased interventions in the secondary government bond market yet again by making all BTr securities eligible for purchase during the new facility's hour of operation.

The action on 17 March involves BSP's corridor system for achieving its interest rate target, as BSP regularly issues its own term liabilities at roughly its own interest rate target to achieve its target rate in normal times.<sup>7</sup> The 24 March and 8 April actions show BSP acting as a backstop to the government bond market, attempting to generate greater market liquidity. The 23 and 26 March actions are BSP's direct finance of the government.

The 23 March repurchase agreement was essentially a six-month direct loan (assuming renewal after the first three months) from BSP to BTr. [Table 3](#) walks through the operations and their effects on the interest rate corridor targeting system for this loan and its eventual repayment. The first transaction is simply BSP crediting the BTr's account. In transaction 2, BTr incurs a deficit and RBs rise. To achieve its target interest rate, BSP would have to return to TDF auctions to drain any RBs that would otherwise push the market rate below its target rate (transaction 3), and would have to pay interest on however much is ultimately auctioned (transaction 4). As the loan from BSP matures, BSP will reduce outstanding TDF liabilities so sufficient RBs are circulating (or otherwise increase RBs as needed, such as by lending in repurchase agreement markets) in transaction 5. Then, in transaction 6, BTr issues its own securities to fund the repayment. In transactions 7 BTr repays the loan.

Note that for BTr, BSP, and the private financial markets, the primary change is that interest on BTr liabilities has been explicitly set by BSP. Because the TDF liabilities auctioned by BSP in transaction 3 are interest bearing, BSP reduces its remittances in kind in transaction (8).<sup>8</sup> For BTr, then, it is as if it issued its own liabilities to financial markets at

<sup>7</sup>As BSP's own literature on its operations states, 'The Term Deposit Facility is a key liquidity absorption facility, commonly used by CBs for liquidity management. The TDF is used to withdraw a large part of the structural liquidity from the financial system to bring market rates closer to the BSP policy rate' (Bangko Sentral ng Pilipinas 2016, p. 5).

<sup>8</sup>BSP's loan to BTr is a zero-interest loan (Leyco 2020).



**Table 3.** Operations for Bangko Sentral ng Pilipinas's Loan to the Government.<sup>a</sup>

Action	Effect on Interest Rate Corridor System (left side in Figures 1 and 2)	Effect on Bangko Sentral ng Pilipinas' Balance Sheet	
		A	L/E
BSP credits BTR's account (1)		Loan to BTR (+)	BTR Acct (+)
BTR incurs a deficit (2)	Shift $S_{RB}$ right		RBs (+) BTR Acct (-)
BSP's TDF auctions drain excess RBs (3)	Shift $S_{RB}$ left		RBs (-) TDF (+)
BSP pays interest on new TDF balances (4)			TDF int (+) Equity int (-)
BSP reduces TDFs auctioned (5)	Shift $S_{RB}$ right		RBs (+) TDF (-)
BTR auction settles (6)	Shift $S_{RB}$ left		RBs (-) BTR Acct (+)
BTR repays loan principal to BSP (7)		Loan to BTR (-)	BTR Acct (-)
BSP remittances to BTR are lower by the interest paid on TDFs <sup>b</sup> (8)			BTR Acct int (-) Equity int (+)

<sup>a</sup>In the table, BSP = Bangko Sentral ng Pilipinas, BTR = Bureau of the Treasury of the government's Department of Finance, TDF = Term Deposit Facility, RBs = reserve balances,  $S_{RB}$  = supply of RBs, as in Figures 1 and 2 above, 'BTR Acct' denotes BTR's account at BSP, 'int' denotes interest payments by BSP on its TDF liabilities and by BTR on its loan from BSP.

<sup>b</sup>BSP does not actually debit BTR's account in (8), but rather the remittance transfer is less than it would have been in the absence of (1) earlier.

the rate BSP set. From the financial system's perspective, the result is to effectively swap BTR liabilities normally linked to the anticipated path of BSP's target rate for TDFs at BSP that earn roughly BSP's target rate. Overall, BSP's explicit backstop of the government securities market and its loan to BTR show its own interest in ensuring the link remains between BSP's target rate and interest rates on government liabilities.

As for its 26 March advanced dividend payment to the government, BSP explains:

To further support the government in its fight against Coronavirus disease 2019 (COVID-19), the Bangko Sentral ng Pilipinas (BSP) will remit [PHP]20 billion as advance dividend to the National Government (NG). The advance dividends constitute 87% of the estimated total dividends based on the BSP's unaudited financial statements for the year 2020.

BSP will remit the [PHP]20 billion advance dividends today, 26 March 2020, through direct credit to the Treasurer of the Philippines-Treasurer Single Account, which is maintained with the BSP. (Bangko Sentral ng Pilipinas 2020)

BSP's remit advance to BTR is effectively direct finance of government, and the repayment occurs as a reduction in kind of future remittances. The transactions for this are in Table 4, for which transactions (2) through (4) are identical to those in Table 3. As with the 23 March repurchase agreement, once the national government incurs a deficit, BSP will drain RBs to achieve its interest rate target within the corridor by auctioning interest-bearing TDF liabilities. When BSP pays interest on TDF liabilities, this reduces its profits. Later, BSP will reduce its remittances by the combined amount of the advance and the interest paid on the new TDF liabilities. The advanced dividend payment ultimately functions as if BTR issued its own debt to the private sector at the TDF auction rate.

**Table 4.** Operations for Bangko Sentral ng Pilipinas's Dividend Advance to the Government.

Action	Effect on Interest Rate Corridor System (left side in Figures 1 and 2)	Effect on Bangko Sentral ng Pilipinas' Balance Sheet	
		A	L/E
BSP makes advanced remittance to BTr (1)			BTr Acct (+) Equity (-)
BTr incurs a deficit (2)	Shift $S_{RB}$ right		RBs (+) BTr Acct (-)
BSP's TDF auctions drain excess RBs (3)	Shift $S_{RB}$ left		RBs (-) TDF (+)
BSP pays interest on new TDF balances (4)			TDF int (+) Equity int (-)
Later, BSP reduces remittances to BTr by combined advance and interest on new TDF balances <sup>a</sup> (5)			BTr Acct and int (-) Equity and int (+)

<sup>a</sup>As in the previous table, BSP does not actually debit BTr's account in (5), but rather the remittance is less than it would have been in the absence of (1) earlier.

As in the previous section's discussion of core points, BTr cannot avoid 'paying' interest on new debt created by deficits even when BSP finances them directly. Because BSP must issue its own interest-bearing liabilities in the meantime, it reduces remittances in-kind and BTr effectively pays roughly BSP's interest rate target on new increases in the national debt. Overall, the reality of CB finance of government is not like the 'printing money' tale in textbooks, financial press, or even from most economists. Instead, the result is an increase in interest-bearing liabilities of the CB, which the government ultimately services, much like if the government had issued the debt in the first place. BSP's actions in the first months of the COVID-19 crisis illustrate the point that the primary rationale of CB support of government is to keep interest rates on new debt lower or intervene to reduce liquidity problems, not to somehow add more impact to the existing deficit, since that is not what happens.

## The Monetary Authority of Singapore and the Government's Drawdown of Reserves

The case of the Monetary Authority of Singapore (MAS) is equally interesting, but in an entirely different way. MAS is well known for its exchange rate-driven monetary policy strategy that targets the Singapore dollar (SG\$) against a weighted basket of currencies to achieve low inflation. At the tactical level, MAS notes that its Monetary and Domestic Markets Management Department (MDD), responsible for implementing monetary policy, is tasked with achieving the nominal effective exchange rate (NEER) target band via foreign exchange markets intervention as well as managing banks' abilities to settle payments and meet regulatory reserve requirements (Monetary Authority of Singapore 2013, p. 2). Of particular interest here is Singapore's government's 'draw on the nation's reserves' to pay for COVID-19 support and how this is, in fact, an example of 'monetization' of government deficits. This requires some details on MAS's typical operations to understand.

Throughout its own publications and speeches, MAS describes itself as an exchange rate targeting CB, not an interest rate targeting CB: 'MAS' liquidity management

framework therefore does not target any level of interest rate or money supply' (Monetary Authority of Singapore 2013, p. 8). Accordingly, it argues, 'as MAS does not have an interest rate target, the borrowing and lending rates for the Standing Facility are market-determined' (p. 18). The ceiling for MAS's interest rate corridor (the Standing Facility Borrowing Rate (SFBR)), as well as the rate it pays on banks' RBs as the corridor's floor (the Standing Facility Deposit Rate (SFDR)), are set daily at +0.5 per cent and -0.5 per cent (though not falling below zero per cent), respectively, from the day's market rate, rather than being policy variables for MAS.

This is true at a strategic level, but not at the tactical level of policy making. MAS obviously understands this and is usually clear in its own publications in this regard, but those without expertise in CB operations may miss the subtleties. Consider the following passages in which MAS distinguishes *intermediate* targets from *direct* or *operational* targets:

Unlike most central banks which target interest rates, MAS uses the nominal exchange rate as the *intermediate target* of monetary policy. (Monetary Authority of Singapore 2018, p. 7; emphasis in original)

Money Market Operations (MMOs) are conducted Daily by the Monetary and Domestic Markets Management Department (MDD) in MAS to manage liquidity within the banking system. ... These are distinct from the implementation of exchange rate policy as MAS does not use domestic interest rates as a tool to carry out its exchange rate-centered monetary policy. (Monetary Authority of Singapore 2018, p. 11)

In other words, there is a distinction to be made between decisions regarding where to set the NEER target range — as set by monetary policy strategy, much like a Taylor-type rule framework works in an interest-rate target strategy for many other CBs — and operations that achieve 'an appropriate amount of liquidity in the banking system — sufficient to meet banks' demand for precautionary and settlement balances, but not excessive' (Monetary Authority of Singapore 2013, p. 8).

Recalling the first core point from earlier, at the tactical level of policy CBs necessarily employ interest rate targets or target ranges, even if the placement of the target or target range is endogenous to, in MAS's case, a NEER target at the strategic level of policy. RBs in circulation exist only on the CB's balance sheet; the quantity of RBs is not *and cannot be* something the 'market' determines without a conscious choice by the CB to accommodate. As Federal Reserve Bank of New York researchers put it, 'the costs of reserves, both intraday and overnight, are policy variables. Consequently, a market for reserves does not play the traditional role of information aggregation and price discovery' (Martin and McAndrews 2008, p. 1). As with other CBs that are the monopoly supplier of RBs with no operational limit to its ability to do so, there is no 'price discovery' in the market for RBs: how much or little precision MAS chooses to use in accommodating banks' demand for RBs necessarily determines the 'market's' rate.

Singapore's private banks' demand for RBs arises from their need to meet required RB holdings against certain liabilities and to also have enough RBs to settle payments for customers and for their own payment obligations. This is standard for monetary policy implementation in other countries, as well (though many do not require banks hold a minimum quantity of RBs greater than zero). Banks' required RBs in Singapore are three per cent of 'qualifying liabilities' held on average during a two-week computation period. After a two-week lag, banks meet the requirement on average throughout a

two-week maintenance period (MAS's RB requirement is thus based on lagged-reserve accounting). End-of-day RBs for a bank can fluctuate between two per cent and four per cent of the qualifying liabilities, as long as average RBs held across the period is at least three per cent. Banks can also run intraday RBs down to zero temporarily to settle payment obligations.<sup>9</sup> In general, a minimum RB requirement met on average across during a maintenance period generates a flatter region  $D_{RB}$  around the CB's interest rate target for much of the period, but this flatter region largely evaporates by the period's end, leaving  $D_{RB}$  much more inelastic.

CBs must accommodate banks in the payments system, and they also must accommodate with some degree of flexibility banks' attempts to meet RB requirements (where applicable, since not all CBs impose RB requirements), all in order to avoid large swings in the market interest rate. In MAS's case,

MAS carries out money market operations every morning at about 9:45am. The purpose of these operations is to ensure that there is an appropriate amount of liquidity in the banking system: sufficient to meet banks' demand for precautionary and settlement balances, but not excessive. (Monetary Authority of Singapore 2013, p. 12)

After deciding on the amount of liquidity to inject or withdraw from the system, as well as the instruments and tenors to transact in, MAS conducts an auction and transacts with Primary Dealers based on the distribution of liquidity in the banking system and the competitiveness of their bids. (Monetary Authority of Singapore 2013, p. 13)

To reiterate, provision of 'an appropriate amount of liquidity' is not possible without doing so consistent with an interest rate or an interest rate range. This is simply supply and demand. Everything that affects  $S_{RB}$  is on MAS's balance sheet and thus *can* be accommodated *or* countered if MAS so chooses; it cannot shift or not shift  $S_{RB}$  in isolation from the existence of  $D_{RB}$ . If it shifts  $S_{RB}$  the market rate changes. If  $D_{RB}$  shifts and MAS leaves  $S_{RB}$  where it is, the market rate changes. If the market rate does not change, MAS enabled that, as well. The fact that  $D_{RB}$  becomes very inelastic beyond what is necessary to settle payments and meet RB requirements further reinforces this. The interest rate or interest rate range that MAS targets is endogenous to the needs of its NEER targeting strategy, but setting a target rate or a target rate range at the tactical level of policy is inherently impossible for it to avoid.<sup>10</sup> Of course, in MAS's case, because the corridor itself is set by the day's 'market' rate that results from MAS's tactical operations — which it refers to as the reference rate — its corridor system enables greater swings in the 'market' rate across days, but this is by MAS's own choices in designing its corridor system and tactics, not something deriving from 'market forces.'<sup>11</sup>

MAS has several tools beyond the standard repo operations with dealers and its standing facilities (SFBR and SFDR) for managing the quantity of RBs within its tactical target range for the reference rate. These are, namely,

<sup>9</sup>The sources for this discussion of Singapore banks' RB requirements are Monetary Authority of Singapore (2013, 2014).

<sup>10</sup>This is essentially the 'compensation thesis' in Lavoie and Wang (2012) applied here to MAS.

<sup>11</sup>MAS defines the reference rate it sets its standing facilities' rates set 0.5 percent above and below as 'the weighted average of successful bids for MAS's SG \$500 million overnight clean borrowing conducted during Money Market Operations on the same day, rounded to two decimal places.' See <https://www.mas.gov.sg/monetary-policy/liquidity-facilities/mas-standing-facility> (accessed 30 September 2020). As the block quotes in the text below explain, MAS's operations are in the mornings, which thereby establish the standing facility rates for the day. So, standing facility rates (SFBR and SFDR) can rise or fall from day to day, but MAS's morning operations set them for any given day.

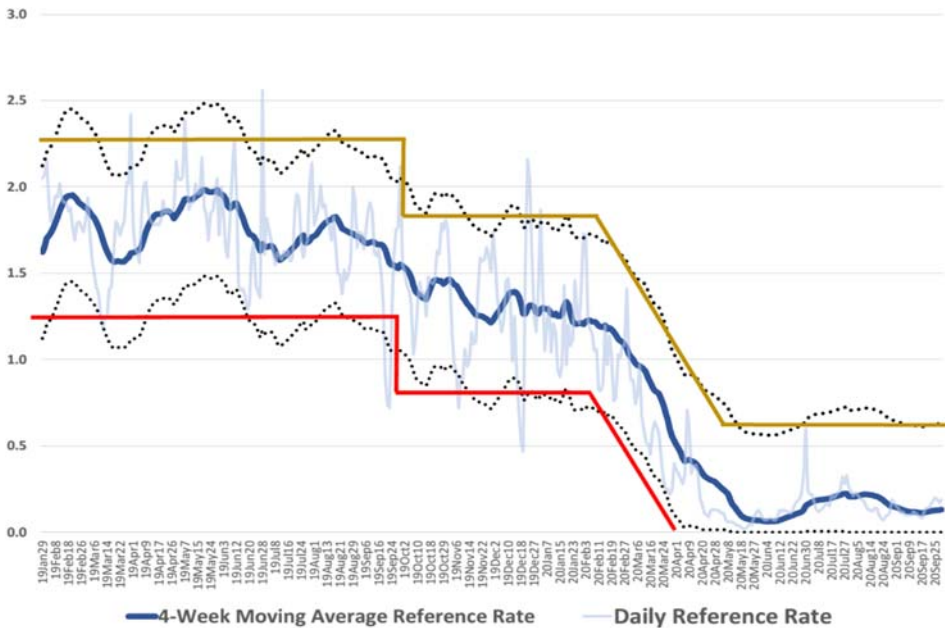
- Very inexpensive intraday credit (currently zero per cent)
- A term (28- and 84-day) repurchase facility for banks and finance companies;
- Term (7-, 28-, and 84-day) lending and borrowing US dollars (US\$) against various possible types of collateral, which, if Singapore dollar (SG\$) denominated, can include ‘cash’ (that is, a currency swap that drains RBs);
- A term renminbi (RMB) facility for loans against SG\$ (a currency swap that drains RBs);
- An overnight RMB facility against SG\$ collateral which can also include ‘cash’ (a currency swap that drains RBs);
- MAS’s own bills (MAS Bills) that have 4 or 12 week maturities, and also issues its own 6-month floating rate notes.

As MAS confirms, ‘the liquidity facilities allow MAS to fine-tune the liquidity in the system as necessary’ (Monetary Authority of Singapore 2013, p. 17). Consequently, shifts in  $D_{RB}$  from banks, or shifts in  $S_{RB}$  from foreign exchange operations, changes in the private sector’s desired holdings of currency, flows to and from the government’s account, and/or anything else on MAS’s balance sheet are accommodated or countered (that is, sterilized) as MAS chooses, and the resulting market interest rate and possible ranges in its volatility are inherently a result of those choices and the design of its corridor system, notwithstanding the fact that those choices are subservient to its NEER targeting strategy.

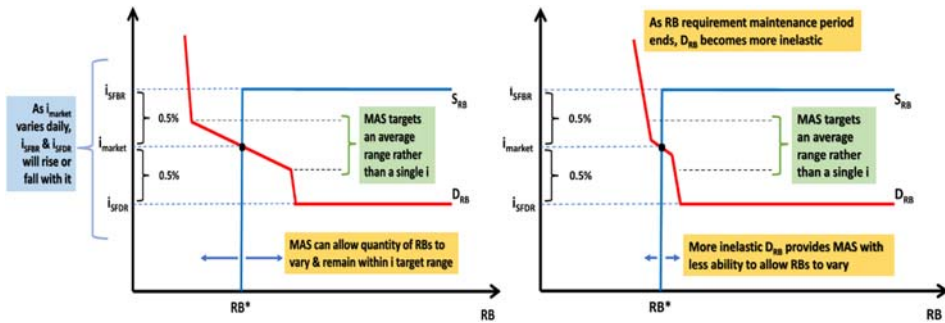
Figure 3 shows the overnight reference rate and MAS Standing Facilities data for January 2019 through February 2021. Values for the daily reference rate (see note 7; calculated here as 0.5 per cent below the reported SFBR) are in both daily data form (thinner, lighter line) and as a four-week moving average (thicker, darker line). The reported SFBR and SFDR are the dotted lines, here in the form of four-week moving averages. From the graph a fairly clear corridor for SFBR and SFDR appears between around 2.25 and 1.25 per cent for January to September 2019, and between 1.75 and 0.75 per cent for October 2019 to around February 2020. These are the values for the gold and red horizontal lines in the graph through February 2020, and could be near what MAS targeted for SFBR and SFDR through February 2020 to be consistent with its NEER target. Thereafter, as COVID-19 events took hold, MAS fairly abruptly allowed both rates to fall, with SFDR at zero and SFBR around 0.65 per cent. By late 2020 the SFBR appeared to rise to around 0.8 per cent while SFDR remained at zero.

Upper and lower dotted lines are four-week moving averages for the Standing Facility Borrowing Rate (SFBR) and Standing Facility Deposit Rate (SFDR), respectively. Gold and red lines are hypothesized average targeted values for SFBR and SFDR, respectively.

From the information in Figure 3, a representation of MAS’s corridor system emerges, which is in Figure 4. The corridor set by  $i_{SFBR}$  and  $i_{SFDR}$  shifts up or down daily with changes in the standing facilities’ reference rate ( $i_{market}$  in Figure 4). In Figure 3, MAS appears more interested in an average value over time for  $i_{market}$  and appears to target average  $i_{market}$  within a range that is not as wide as the corridor.  $D_{RB}$  flattens somewhat within the range that banks hold RBs during most of the maintenance period in the left graph, providing MAS with a range of quantities of RBs that are consistent with an average target range. As the maintenance period comes to an end nearly all of this flattened portion of  $D_{RB}$  evaporates in the right graph, leaving MAS facing a more inelastic  $D_{RB}$ .



**Figure 3.** Monetary Authority of Singapore’s Standing Facility Borrowing Rate, Standing Facility Deposit Rate, and Imputed Standing Facility Reference Rate (January 2019 – February 2021). Source: Monetary Authority of Singapore and authors’ calculations.



**Figure 4.** Monetary Authority of Singapore’s Corridor System During the Maintenance Period (Left Graph) and at the Maintenance Period’s End (Right Graph)

The exceptions in which the overnight rate has increased or decreased significantly prove the rule. As MAS explains,

In mid-September 1985 when there was a speculative attack on the Singapore dollar, MAS intervened in the foreign exchange market to buy the Singapore dollar against the US dollar but did not offset the liquidity drain of the intervention through money market operations. The intervention operation was left unsterilized, so as to reduce banking system liquidity and make it costly for speculators to cover their short Singapore dollar positions. . . . Overnight interest rates surged close to 100% per annum that day and hovered between 20-30% per annum for the following few days. (Monetary Authority of Singapore 2013, p. 13)



On the morning of 12 September 2001, following the terrorist attacks on New York City the night before, MAS injected [SG\$] 2.5 billion into the banking system to bring banks' cash balances with MAS to 4.5%, above the statutory minimum of 3%, to calm market participants and ensure the smooth functioning of all Singapore dollar markets. It was only after some calm had been restored to the market that MAS withdrew some of the liquidity late in the afternoon. (p. 13)

Clearly MAS recognizes that its own actions created these significant swings in the overnight interest rate, not the 'market,' at the tactical level.

What do MAS's operations to set an interest rate target range at the tactical level consistent with its NEER targeting strategy have to do with 'monetization' given that Singapore's government legally prohibits itself from incurring deficits? Everything. While it may not run deficits as typically understood, Singapore nonetheless issues government debt, and the details of how and why are very unique. As Singapore's Ministry of Finance explains,

The Singapore Government currently issues the following domestic securities for reasons unrelated to the Government's fiscal needs:

- (1) Singapore Government Securities are issued to develop the domestic debt market;
- (2) Special Singapore Government Securities are non-tradable bonds issued primarily to meet the investment needs of the Central Provident Fund (CPF), Singapore's national pension fund; and
- (3) Singapore Saving Bonds are introduced to provide individual investors with a long term saving option that offers safe returns. (Accountant-General's Department 2019, p. 3)

It confirms that, 'under the Government Securities Act, the borrowing proceeds from the issuance of these securities cannot be spent and are invested' (p. 3). When Singapore's government raises funds from the issuing of Government Securities (SGS) or Singapore Savings Bonds (SSB), or net inflows to CPF, these are all credits to its account(s) at MAS and an in-kind reduction in RBs held by Singapore's banks, consistent with the second core point earlier in this paper. Next, the funds are pooled together and 'MAS converts these funds into foreign assets through the foreign exchange market' (Singapore Ministry of Finance n.d.). Note that this adds back the RBs, leaving no net change to RBs from bond issuance. Government of Singapore Investment Corporation (GIC)<sup>12</sup> manages much of the government's international investments (the other 'fund manager' being MAS, which manages the official foreign reserves) in a globally diversified portfolio, then takes over management of the foreign assets.<sup>13</sup>

While the government cannot spend proceeds of bond sales, it does have legal access to total net investment returns beyond the costs of servicing the securities and managing the investment portfolio. This Net Investment Returns Contribution (NIRC) is then additional annual funding for the government's budget. NIRC is composed of (a) up

<sup>12</sup>GIC is 'a private company wholly owned by the Government of Singapore. We do not own the assets we manage ...' Further, 'although we are government-owned and manage Singapore's reserves, our relationship with the government is that of a fund manager to a client.' See <https://www.gic.com.sg/faq/> (accessed 30 September 2020).

<sup>13</sup>As in the Accountant-General's Department description, CPF receives non-marketable Special Singapore Government Securities (SSGS) in exchange for the funds GIC invests. Essentially, CPF's holdings of SSGS provide it with legal authority to pay future benefit payments equal to revenues, interest from SSGS, and the value of the SSGS holdings. The SSGS holdings do not provide *financial ability* to pay, though, since CPF's SSGS holdings and interest payments from them exist only as internal accounting among different departments within the same government.



to 50 per cent of annual Net Investment Income (NII) from interest and dividends (again, net of debt service and other expenses) and (b) up to 50 per cent of annual Net Investment Returns (NIR), calculated as the real expected long-term capital gains<sup>14</sup> (that is, after netting out anticipated long-term inflation) from the net of invested assets less liabilities (Ministry of Finance n.d.). The NIRC values for 2018 and 2019 were SG \$16 billion (Accountant-General's Department 2019, p. 7) and SG \$17.2 billion (Ministry of Finance n.d.), or 3.25 per cent of 2018 GDP and 3.4 per cent of 2019 GDP, respectively.

Returning to MAS's operations, when the government spends its annual NIRC, this is a net increase in RBs. The NII portion is a credit to the government's account at MAS, while the offsetting operations is MAS acquiring foreign assets from GIC or adding to its own foreign investment portfolio (that is, dividends and interest cash flows from GIC's and MAS's international investments are in foreign currencies).<sup>15</sup> The quantity of combined actual assets owned by MAS and/or the government (itself the owner of GIC) in fact remains unchanged; at most there are asset transfers between the government via its own investments and MAS so that the full value of the NIRC is on MAS's balance sheet (if it was not already) while total holdings across the two remain the same. When the government's spending draws these balances down, this is just a reduction in its account and an increase in RBs; because MAS's assets remain unchanged, the NII contribution necessarily remains among MAS's assets. Of course, when the government spends and RBs rise in kind while no government securities 'fund' the spending, it is left to MAS to sterilize the rise in RBs by issuing its own liabilities in order to avoid providing an 'excessive' amount of liquidity to banks that would push the market interest rate in Figure 4 down below whatever average rate range MAS is supporting. Sterilizing the increase in RBs then requires MAS to pay interest on its own additional liabilities, which reduces remittances from MAS to the government.

Table 5 presents the case of NII where MAS's investments are the source of the interest cash inflows. Transaction (1) shows the interest income from MAS's global portfolio ('Inv. Port.' in the table) increasing MAS's equity. In (2), MAS makes NII transfers to the government's account, reducing MAS's equity and raising the government's net worth. The government's spending is in (3), here assumed to be payments to households, which raises household net worth and reduces the government's in-kind. Because (3) increased RBs, MAS sterilizes it in (4) by issuing MAS Bills to banks. Following (4), of course, MAS will pay interest on its bills, ultimately reducing its remittances. (The operations are not dissimilar for NII paid from GIC's interest and dividend income, since these also come from international investments and, being wholly owned by the government, GIC's income is the government's income.) As noted above, and of particular interest, is that the government's spending of the NII proceeds does not reduce the balances in MAS's global portfolio. Instead, MAS's interest obligations on its MAS Bills become a cost relative to the returns that can be earned on this increased size of the investment portfolio. Overall, then, spending NII proceeds is equivalent to the government running a deficit without a bond sale — *monetization* — and MAS issuing its own bills to raise funds for the global investment portfolio. The net effect is *as if*

<sup>14</sup>Essentially this is an expected average annual real return from capital gains.

<sup>15</sup>For simplicity the discussion abstracts from Temasek Holdings, a third manager of Singapore government's reserves (in addition to GIC and MAS) focusing on long-term equity investments within and outside of Singapore. The Singapore government is the sole equity holder of Temasek.

**Table 5.** Monetary Authority of Singapore Credits Net Income Investment to Government.

	Singapore Government		MAS		Banks		Households	
	A	L/E	A	L/E	A	L/E	A	L/E
(1) MAS receives interest on global investments			Inv. Port. (+)	Equity (+)				
(2) MAS credits Government with NII	MAS Acct (+)	Net Worth (+)		Govt Acct (+) Equity (-)				
(3) Government spends (or cuts taxes)	MAS Acct (-)	Net Worth (-)		RBs (+) Govt Acct (-)	RBs (+)	Dep <sub>HH</sub> (+)	Dep. (+)	Net Worth (+)
(4) MAS issues MAS Bills to Sterilize RBs				RBs (-) MAS Bills (+)	RBs (-) MAS Bills (+)			

Singapore's government ran a deficit, with its indirect debt service for MAS's new liabilities reducing in kind future interest and dividend income from the national reserves net of cost of servicing liabilities.

The NIR portion is an outright credit to the government's account at MAS beyond assets held by MAS and/or GIC, since NIR does *not* arise from any cash flows to the investment portfolios or from asset sales. The actual mechanics are unreported, but at most NIR is merely an intragovernmental advance from the reserve fund(s) to MAS and the government's account that is made whole upon the funds' realization of capital gains in the future. Effectively, this is the same as beginning with transaction (2) in Table 5 and skipping (1). While there is no increase in the investment portfolio (since (1) is skipped), like NII, NIR does not reduce combined assets of the funds. Further, as with NII yet again, following (4), MAS pays debt service on its additional liabilities, and then reduces remittances. The overall effect is again as if the government simply runs a deficit that MAS sterilizes rather than the government issuing its own bonds, which increases the costs of the *existing* global investment portfolio relative to its total future returns (both interest and capital gains).<sup>16</sup> In short, the NIR contribution may provide the *legal* authority for the government to spend, but the operational reality is the spending is 'funded' when MAS credits the government's account as the law requires it to do.

In response to COVID-19, Singapore's government is effectively doubling the size of its budget, with more than half of the total — more than SG \$100 billion — applying to the COVID-19 response. The NIRC for 2020 is SG \$18.6 billion. The government is also making a SG \$54.5 billion drawdown from national reserves, the portfolios of investments that originate from past government securities issuance, past surpluses, past government asset sales, and so on.<sup>17</sup> As with NIRC, actual operations for a drawdown are

<sup>16</sup>Of course, given the government's regular auctions of SSGs, it could also be that an SSG auction removes the excess RBs and MAS's sterilization via MAS Bill issuance is unnecessary. Note that this is effectively the government running a deficit and *afterward* issuing SSGs, illustrating that its own bonds are for the purpose of aiding MAS's interest rate maintenance, not funding a deficit.

<sup>17</sup>2020 NIRC and National Reserves drawdown figures are in several sources, such as Kurohi (2020).

unreported, so it is unclear if it involves actual sale of SG \$54.5 billion in assets to acquire the funds. If not, then it is simply a credit to the government's account at MAS, like the NIR portion of NIRC in transactions (2), (3), and (4) in Table 5. And, again, like with NIRC, the government's subsequent spending increases RBs that MAS will sterilize via increases in its own interest-bearing liabilities, for which the interest payments also reduce remittances to the government. If the drawdown is from a sale of foreign currency-denominated assets held by GIC, for instance, this functions like the NII portion of NIRC, again raising RBs, requiring sterilization operations and increased debt service from MAS, and ultimately reduced remittances to the government. Note, though, that the actual size of the national reserves is unchanged, only shifting from foreign investments to foreign exchange balances. Overall, the end result of a drawdown in either case is effectively the same as it is with NIR: to leave the national reserves themselves unchanged but to increase their relative costs (or, otherwise stated, to reduce their net returns) through additional debt service by MAS and/or the government if its SSG auctions are at the time such sterilization is necessary.

To conclude, while to the casual observer a drawdown of national reserves may appear to be simply a drawdown of savings like any firm or household might, for a government with a CB, this is in fact simply a credit to the government's account at the CB, with the subsequent spending raising RBs that must either be drained and replaced by an interest-earning liability of the CB (in a corridor system) or earn interest at the CB's target. Thus, the drawdown of reserve funds by Singapore's government creates additional, interest-bearing liabilities for MAS, who then reduces remittances such that the government effectively pays this interest as if it had incurred new debt equal to the amount of the drawdown. Thus, a 'reserve drawdown' for a government transacting through its account at the CB is operationally the same thing as a deficit that results in new debt outstanding along with new debt service requirements. While 'pre-funding' likely appears to many to be 'better housekeeping' (including perhaps to international governance institutions like the IMF), operationally there is no way around the accounting fact that either Singapore's Government or MAS (or both) will end up with more interest-bearing liabilities outstanding. Finally, unlike when the private sector draws down its own savings or investments, for a nation with a CB that creates its own liabilities in its own currency without prior funding or concerns for its own solvency in its own currency, this does not reduce the CB's assets, which means it is not the assets that are necessary for the spending in the first place, but rather simply the legal authorization or requirement from the government that the CB credit the government's account.

### China's Monetization Debate

A 'heated' debate emerged in China in Spring 2020 regarding whether or not the People's Bank of China (PBoC) should 'monetize' the national government's deficits. Liu Shangzi, President of the Academy of Fiscal Science and member of China's top political advisory body, argued that 'monetization of the fiscal deficit will ease the government's tight financing conditions'; he further suggested it could avoid the crowding out effect on financial markets as the deficit reached a multiyear high as a percent of GDP (Shangxi 2020). Numerous others countered this view. Ma Jun, a member of PBoC's monetary policy committee referred to 'direct printing of money' as the source of asset price

bubbles and hyperinflation (Jun 2020). Wu Xiaoling, former deputy governor of PBoC and current Vice Chair of the Financial and Economic Committee of the National People's Congress, argued that 'currently, the Chinese [government bond] market has plenty of room for government bonds' (Xiaoling 2020). The previous sections of this paper can shed light on these differing points of view, walking through the three core points and applying, where applicable, the experiences of the Philippines and Singapore.

PBoC's operations lie somewhere between the Philippines' BSP and Singapore's MAS. It runs an interest rate corridor system for which it announces both ceiling and floor rates like BSP rather than allowing them to vary across days, but it also allows interest rates to vary within the corridor on average and uses numerous tools at different maturities to achieve a target range on average like MAS (He and Jia 2020). Unlike the other two CBs, PBoC's interest rate targeting operations also occur within a significantly wider corridor (for instance, during January through May 2020, the width of the corridor was 2.6 per cent), enabling PBoC's target rate range changes to occur without requiring PBoC to announce changes to the corridor itself. Further, PBoC makes more frequent use of changes in RB requirements than is typical for other CBs, and its operations are across a broader range of maturities that appear to tie interbank and repo rates out to one year (Felipe and Fullwiler 2020).

As noted earlier, China's government employs a Treasury Single Account System (TSAS) that does not make use of correspondent bank accounts, unlike, say, the US before the Lehman Brothers failure (He and Jia 2020).<sup>18</sup> The TSAS leaves daily changes to the government's account at PBoC as a significant source of 'autonomous' changes to PBoC's balance sheet, and leaves PBoC with the task of sterilizing these changes as necessary in order to achieve the policy target range. Figure 5 shows monthly averages for PBoC's balance sheet (in billions of Chinese yuan (CNY)) categorized by the change to currency and the government's account together (the two primary autonomous portions of PBoC's balance sheet, dark green columns), change to RB's (black and white speckled columns), and the negative of the sum of changes to claims on financial institutions, 'other' assets, and 'other' liabilities (light orange columns).<sup>19</sup> The changes to RBs were those (again, on average for the month) implicitly consistent with achieving the PBoC's interest rate target range. The autonomous changes to currency and the government's account are changes to RB's (negative or positive) that would occur if PBoC did not sterilize them. The operations of PBoC (reported as claims on financial institutions, 'other' assets, and 'other liabilities') adjust the quantity of RBs such that the quantities in the figure above and below zero are roughly the same in absolute value and thus their netted value is close to zero.<sup>20</sup>

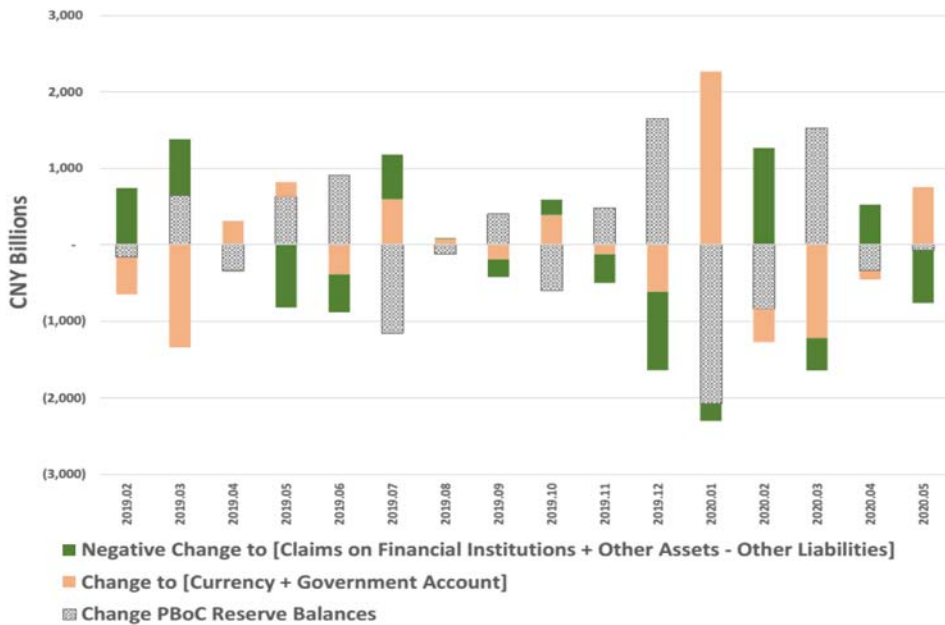
Given that PBoC sets an interest rate target within a corridor system *and* that government spending, revenues, and bond sale settlement all occur via the government's account on the PBoC's balance sheet, as with BSP and MAS, any 'monetization' operations by the PBoC of government debt would necessarily require it to allow the overnight interest rate to fall to the rate it pays on RBs (for PBoC, this is the rate paid on excess RBs,

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<sup>18</sup>See Bell (2000) and Tymoigne (2014) on the Treasury Tax and Loan account system in place until 2008 in the US.

<sup>19</sup>PBoC publishes its balance sheet at the monthly frequency.

<sup>20</sup>Claims on Financial Institutions are many times larger than both the 'Other' Assets and 'Other Liabilities.' Other items on the balance sheet, including Claims on Government, Foreign Exchange, Foreign Liabilities, and Bonds Issued, varied little at least at a monthly frequency during this time period.



**Figure 5.** Changes to the People’s Bank of China’s Balance Sheet (Monthly Averages in CNY Billion, January 2019 to May 2020). Source: People’s Bank of China and authors’ calculations

since RBs required against liabilities do not earn interest), to increase this rate, and/or to issue its own interest-bearing liabilities. Yet again, ‘monetization’ in the sense of creating non-interest bearing RBs is not operationally possible without a zero interest rate target policy (ZIRP). Government deficits *are* accompanied by interest-bearing liabilities in some combination from the CB or government.

This is verified by the PBOC’s Open Market Operations Office, which explained in its ‘Announcement of Open Market Operations No. 124 [2020]’ on 29 June 2020 that,

Due to growing fiscal expenditure at the end of the month, the liquidity is adequate at a reasonable level in the current banking system. The People’s Bank of China decides not to conduct reverse repo operations on June 29, 2020. (The People’s Bank of China 2020)

PBoC calls its repurchase agreement lending operations ‘reverse repo operations,’ consistent with private sector practice, but the opposite of how this is done by the Fed and other CBs for which ‘repo’ refers to adding RBs and ‘reverse repo’ refers to draining them. Consequently, the 29 June statement simply and matter-of-factly informs that the government’s deficit is providing the RBs to accommodate banks’  $D_{RB}$  within the desired portion of PBoC’s target range within the interest rate corridor, such that PBoC’s own operations are unnecessary. The end-of-month deficits mentioned in the statement did not raise interest rates, but instead added RBs to keep the interbank rate from rising out of the PBoC’s target range. Far from ‘printing money,’ these deficits ‘funded’ via additional RBs were simply integrated into the PBoC’s normal interest rate management procedures. Overall, there may not be a more succinct public statement by any CB in any historical period that more clearly illustrates the first two core points of this part of the report as they occur in practice.

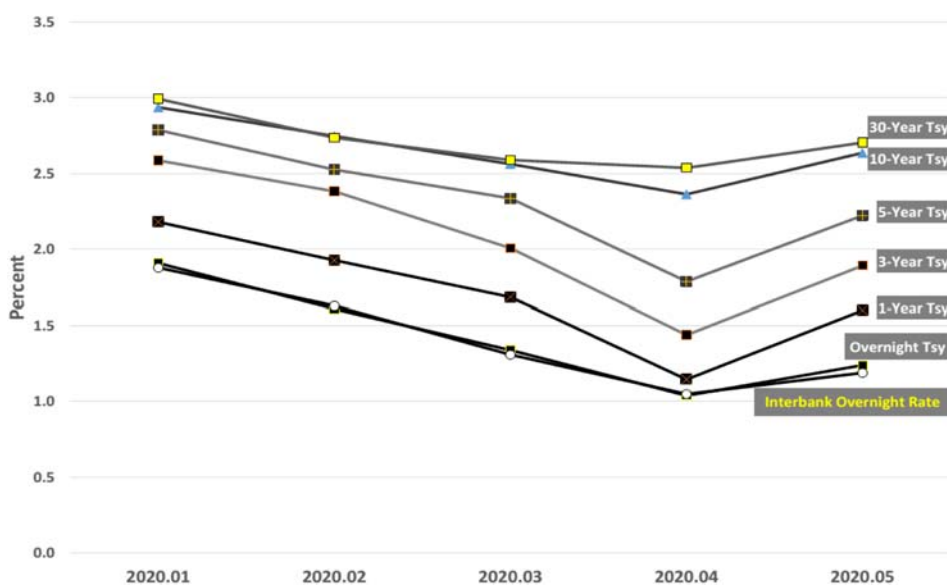
As with the third core principle from earlier, whether or not it is desirable for PBoC to engage in ‘monetization’ therefore has more to do with whether there is sufficient liquidity in the government bond markets to bring the yield curve on government bonds in line with the anticipated path of the CB’s interest rate target, and if so, whether or not the CB prefers bond markets to have a still lower anticipated path of its target rate. Wu Xiaoling’s (2020) op-ed from above expressed essentially this view for the PBoC:

If there is a problem with market liquidity, the central bank will buy and sell government bonds in the secondary market to provide liquidity.

The biggest advantage of the People’s Bank of China buying and selling government bonds from the secondary market is that it can form the yield curve of government bonds and provide a risk-pricing benchmark for the financial market.

As above, she concluded that the Chinese market for government bonds was sufficiently liquid, having ‘plenty of room’ for more bond issuance. Figure 6 shows monthly averages for the interbank overnight rate that PBoC manages with rates on government securities across the yield curve for January through May, 2020. The treasury rates decline through January through April with the interbank overnight rate, and then increase with the interbank rate’s slight rise in May. The May increases in government treasury rates are larger than for the overnight rates, suggesting further anticipated rate increases from PBoC. Consistent with Wu, China’s treasury rates did not move in a way inconsistent with the PBoC’s average target rate for the interbank overnight rate.

Returning to the ‘monetization’ debate in China, the analysis here suggests flaws in the arguments both for and against ‘monetization.’ It is *not* ‘direct printing of money’ — it is an exchange of an interest-earning government liability for an interest-earning central bank liability. While the size of a deficit could surely be too large with respect to



**Figure 6.** Interest Rates for Interbank Overnight Lending and Government Bonds (‘Tsy’) (Monthly Averages, January 2020 to May 2020). Source: People’s Bank of China



a given inflation target, whose interest-earning liability accompanies it is not a difference of macroeconomic significance, much less the knife-edge point between price stability and hyperinflation. On the other hand, PBoC indirectly supports China's government bond market *already*. 'Crowding out' does not apply here — from the simple accounting in Table 1, a government deficit *adds* private saving rather than withdrawing it, while a bond market backstopped by PBoC even indirectly means interest rates on government debt are driven by monetary policy strategy, not savers and borrowers of 'loanable funds.'

## Conclusion

The core argument of this paper is that 'monetization' does not occur in the way most learn it, economists and lay people alike. 'Direct printing of money' as commonly understood is not operationally possible. In a corridor interest rate targeting system the CB's purchases of government debt are sterilized by an offsetting reduction in the CB's assets or an increase in its own interest-bearing liabilities. In a floor system, the sterilization is via interest on RBs. It is not operationally possible for 'monetization' to be the macroeconomic equivalent of adding 'jet fuel' to a government's deficits. This means that it is not worth fearing, but it also means that it is not a solution in itself for an economy that is growing too slowly.

The recent example from Singapore illustrates this: 'monetization' already happens, quite regularly, and rarely does anyone notice or care, since, again, it is merely a swap of interest-bearing government liabilities for CB interest-bearing liabilities. Beyond the examples in this paper, obviously, the experiences of Japan, the ECB, and the Federal Reserve in the 2000s and 2010s demonstrate that 'printing money' to create inflation is not as easy as undergraduate economics textbooks claim. But old theories die hard even when they are inapplicable, and the fearmongers (again, economists and non-economists alike) appear without exception even now whenever CB 'monetization' of government debt appears to have a likelihood greater than zero, much less announced as policy.

This paper's caveat regarding the non-effects of 'monetization' is that CBs can set the yield curve on domestic currency government debt. In countries with very liquid bond markets, they are already doing this and have been doing so for decades, indirectly 'monetizing' government debt as a counterparty and/or backstop to primary dealers in order to enable competitive, liquid markets in which the cost of funds for the marginal trader is roughly the anticipated path of the CB's target rate. While 'monetization' does not have a *quantitative* effect beyond a deficit itself, it can have an interest rate effect if the CB chooses to bring down the interest rates on government debt below such levels or provides market liquidity when government debt markets are short of it. Lastly, because interest rates on domestic currency government debt *always* at the very least implicit CB policy variables, it is incoherent to believe that there is an on-off switch in which 'markets' impose 'discipline' and CBs usurp it.

Of course, potential issues remain, one of the most important being what to make of CB independence in the current context. While beyond the scope of this paper, it is worth recalling that for the past 12 years economists of many different persuasions have pushed increasingly for an increased role for fiscal policy. At some point this should bring a rethink of their standard approach to 'fiscal rules,' to instead embed an inherently



necessary, active fiscal policy in a macroeconomic policy framework consistent with inflation targeting. Indeed, as if on cue, Blanchard, Leandro, and Zettlemeyer (2021) now propose ‘the abandonment of fiscal rules in favor of fiscal standards, i.e. qualitative prescriptions that leave room for judgment together with a process to decide whether standards are met’ (p. 1). While a clear improvement upon previous fiscal rules, Blanchard, et al., do not account for the three core points grounding the analysis in this paper. In our view, this leaves their ‘standards’ with still too much weight placed on dangers of ‘fiscal sustainability’ even if done more flexibly than with previous ‘fiscal rules.’

Clearly perceptions and understandings are evolving, if slowly or at least slower than some of us might prefer. In September 2020, as the Philippines rewrote laws to allow BSP to lend even greater amounts to BTr, and as Indonesia had itself changed laws to allow Bank Indonesia to directly purchase government debt in the primary market, Standard and Poors’ response was,

We have not seen signs that increased government bond purchases have damaged central bank credibility in India, Indonesia, and the Philippines. Inflation and interest rates have not picked up in these economies, and exchange rate changes have been modest so far. (quoted in Noble (2020))

Even in early 2021, Indonesia’s exchange rate had depreciated only 1.5 per cent against the US dollar over the previous year, while year-to-year inflation has fallen from 3 per cent in January 2020–1.5 per cent in January 2021. There are obvious continuing concerns for nations that are not able to withstand or otherwise avoid negative macroeconomic impacts of significant exchange rate depreciations, but it is well past time for recognizing that exchange rates are probably more complex than any individual’s theory of them.

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## References

- Accountant-General’s Department. 2019 [update]. *Understanding Singapore Government’s Borrowing and Its Purposes—An Overview*. Singapore: Ministry of Finance.
- Bangko Sentral ng Pilipinas. 2016. *Revised Framework for Monetary Operations Under the BSP Interest Rate Corridor (IRC) System*.
- Bangko Sentral ng Pilipinas. 2020. ‘BSP to Remit P20 Billion Dividends to Fight COVID-19.’ *Media Release* (March 26).
- Bell, S. 2000. ‘Do Taxes and Bonds Finance Government Spending?’ *Journal of Economic Issues* 34 (3 (September)): 603–620.
- Blanchard, O., A. Leandro, and J. Zettlemeyer. 2021. ‘Redesigning EU Fiscal Rules—From Rules to Standards.’ Working Paper 21-1 (February). Washington, D.C.: Peterson Institute for International Economics.

- Duffie, Darrell. 2020. 'Still the World's Safe Haven? Redesigning the U. S. Treasury Market after the COVID-19 Crisis.' Hutchins Center Working Paper No. 62 (June). Washington, D. C.: The Brookings Institute.
- Felipe, J., and S. Fullwiler. 2020. 'The PRC's Monetization Debate.' Presentation at the Asian Development Bank (July 24).
- Fleming, M. 2020. 'Treasury Market Liquidity and the Federal Reserve During the COVID-19 Pandemic.' *Liberty Street Economics* (May 29). New York, NY: Federal Reserve Bank of New York.
- He, Z., and G. Jia. 2020. 'An Institutional Analysis of China's Reform of Their Monetary Policy Framework.' *Journal of Economic Issues* 54 (3) (September): 838–854.
- Jun, M. 2020. 'My View on Monetization of Fiscal Deficit.' *Financial News* (May 18). Original in Chinese.
- Kurohi, R. 2020. 'Singapore's Revenue Position Set to Remain Weak for Some Time.' *The Straits Times* (October 6).
- Lavoie, M. 2014. *Post Keynesian Economics—New Foundations*. Northampton, MA: Edward Elgar.
- Lavoie, M., and P. Wang. 2012. 'The 'Compensation Thesis,' as Exemplified by the Case of the Chinese Central Bank.' *International Review of Applied Economics* 23 (3) (May): 287–301.
- Leyco, C. S. 2020. 'BSP Extends Zero-Interest Loans to Government.' *Manila Bulletin* (March 30).
- Logan, L. K. 2020. 'The Federal Reserve's Market Functioning Purchases—From Supporting to Sustaining.' Remarks at a Securities Industry and Financial Markets Association webinar (July 15). New York, NY: Federal Reserve Bank of New York.
- Martin, A., and J. McAndrews. 2008. 'Should There Be Intraday Money Markets?' Staff Report no. 337 (July). New York, NY: Federal Reserve Bank of New York.
- Monetary Authority of Singapore. 2013. *Monetary Policy Operations in Singapore*. Monetary and Domestic Markets Management Department (March).
- Monetary Authority of Singapore. 2014. *MAS Notice 758—Minimum Cash Balance*. Revised on March 6.
- Monetary Authority of Singapore. 2018. *Frequently Asked Questions on Singapore's Monetary Policy Framework*. Economic Policy Group (October 10).
- Noble, L. W. T. 2020. 'BSP Can Lend More to Government Under Bayanihan II.' *BusinessWorld* (September 15).
- People's Bank of China. 2020. 'Open Market Operations No. 124 [2020]'.
- Pozsar, Z. 2019a. 'Collateral Supply and O/N Rates.' *Global Money Notes #22*. Investment Strategy Department, Credit Suisse AG (May 31).
- Pozsar, Z. 2019b. 'Design Options for an O/N Repo Facility.' *Global Money Notes #25*. Investment Strategy Department, Credit Suisse AG (September 9).
- Shangxi, L. 2020. 'Opinion—Deficit Monetization Is A Reasonable Choice for the Current Fiscal and Monetary Policy Combination.' *Caixin* (May 14). Original in Chinese.
- Singapore Ministry of Finance. n.d. *Our Nation's Reserves*. Accessed on August 1, 2020.
- Tankus, N. 2020. 'Looking Back at 'Repo Madness' One Year Later.' *Notes on the Crises* (September 21). <https://nathantankus.substack.com/p/looking-back-at-repo-madness-one> (accessed January 27, 2021).
- Tymoigne, E. 2014. 'Modern Money Theory and Interrelations between the Treasury and the Central Bank—The Case of the United States.' *Journal of Economic Issues* 48 (3) (September): 641–662.
- Xiaoling, W. 2020. 'Analysis of China's Fiscal Deficit Monetization.' *Financial News* (May 18). Original in Chinese.