
FOUR INFORMATIONAL CHALLENGES FACED BY CENTRAL BANKS TODAY

- CSGS Presentation
- London, 25 April 2023

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(revised April 23, 2023)



(1) INTRODUCTION

- Four daunting challenges for all central banks.
 1. Relearning how to control inflation when confronted with a range of supply shocks and combined demand and supply shocks.
 1. Sudden, dramatic and temporary (Covid, Ukraine, other temporary supply chain disruptions).
 2. Gradual and secular (demographics, deglobalization/bifurcation, climate change).
 2. Enhanced LOLR and MMLR roles in pursuit of the financial stability mandate.

International LOLR role for Fed and ECB.
 3. Managing the digital transformation.
 1. Security: quantum computing, classical encryptions and cyberattacks.
 2. CBDCs.
 3. DeFi, Cryptocurrencies, cryptoassets & other digital assets, AI.
 4. Resisting fiscal dominance/fiscal capture: combining operational independence in the pursuit of price stability with the undeniable ability of the central bank to fund the sovereign and monetize government deficits and debt.

(1) INTRODUCTION

- Further challenge for EMDE central banks:
 - Cope with the disruptive impact of AE financial tightening on forex markets and cross-border capital flows.
 - Absence of effective domestic (central bank) LLOR and MMLR in heavily dollarized or euroized economies.

(2) RELEARNING INFLATION CONTROL

1. Temporary and transitory narrative
 1. Statistical 'base effect'
 2. Labor supply reductions and supply chain disruptions caused by Covid pandemic
 3. Russia's invasion of Ukraine and sanctions; impact on commodity markets (food, energy, fertilizer, non-ferrous metals etc.). Tail risks (including the conflict going nuclear).
2. Lasting supply-side ('scarring effects') of Covid
 1. Excess mortality
 2. In U.S.: lower labor force participation and increase in frictional and structural unemployment.
3. Deglobalization/bifurcation of global economy. Re-shoring and friend-shoring.
4. Building redundancy into supply chains (from 'just in time' to 'just in case'); this applies even to geopolitically robust supply chains
5. Demographics – population ageing.
6. Climate change and public and private response to it.

(2.) to (6.) drive a persistent lower path of global potential output.

(2) RELEARNING INFLATION CONTROL

The record:

- U.S.; March 2023, CPI: 5.0% (February 2023: 6.0%); CPI Core: 5.6% (February 2023: 5.5%);
 - U.S. February 2023, PCED: 5.0% (January 2023: 5.3%); February 2023, PCED Core: 4.6% (January 2023: 4.7%)
- Euro area; March 2023, HICP: 6.9% (February 2023: 8.5%; December 2022: 9.2%); HICP Core, March 2023: 5.7% (February 2023: 5.6%; December 2022: 5.2%).
- UK; CPIH, March 2023: 8.9% (February 2023: 9.2%; January 2023: 8.8%; October 2022: 9.6%); CPIH Core, March 2023: 5.7% (February 2023: 5.7%; January 2023: 5.3%; October 2022: 5.8%).
 - UK; CPI; March 2023: 10.1% (February 2023: 10.4%; January 2023: 10.1%; October 2022: 11.1%); CPI Core, March 2023: 6.2% (February 2023: 6.2%; January 2023: 5.8%; October 2022: 6.5%).
- Japan; March 2023, CPI “Core”: 3.1% (February 2023: 3.1%; January 2023: 4.2%); CPI “Core Core”, March 2023: 3.8%; (February 2023: 3.5%).
- Canada; CPI, March 2023: 4.3% (February 2023: 5.2%; January 2023: 5.9%); CPI trim, March 2023: 4.4% (February 2023: 4.8% ; January 2023: 5.1%).

(2) RELEARNING INFLATION CONTROL

- Inflation expectations: U.S.:
 - Short-term (1-year) March 2023: 4.7% (Fed of NY Survey of Consumer Expectations)
 - Medium-term (3-year) March 2023: 2.8% (, ,)
 - Long-term (5-year) March 2023: 2.5% (, ,)
 - Long-term: 5-year, 5-year forward breakeven inflation rate, April 14, 2023: 2.29%
 - : 10-year expected inflation rate (Cleveland Fed)) March, 2023: 2.10%
 - : 10-year Breakeven Inflation Rate, April 14, 2023: 2.30%

So longer-term inflation expectations in the U.S. have not yet become unanchored – the time to act is now – before they too become unanchored and raise the output and unemployment cost of achieving a lasting reduction in inflation!

(2) RELEARNING INFLATION CONTROL

- Inflation expectations: UK (Citi / YouGov survey)
 - Short-term (1 year) March 2023: 5.4% (February 2023: 5.6%; January 2023: 5.40%; December 2022: 5.7%)
 - Long-term (5 to 10 years): March 2023: 3.7% (February 2023: 3.8%; January 2023: 3.5%; 3.6% December 2022; pre-Covid-19: 3.0-3.4%)
- Inflation expectations: Euro Area
 - Short-term (1-year) median expectations ECB-Consumer Expectations Survey, February 2023: 4.6% (January 2023: 4.9%)
 - Medium-term (3-year) median expectations ECB-CES, February 2023: 2.4% (January 2023: 2.5%)
 - Long-term (five-year inflation swap; March 27, 2023: 2.49%; five-year/five-year forward inflation swap: 2.35%)
 - Survey of Professional Forecasters, Q1, 2023:
 - 1 year ahead: 3.6%
 - 2 years ahead: 2.2%
 - 5 years ahead: 2.1%
 - ECB staff forecast 16 March 2023: Headline inflation 2023: 5.3%; 2024: 2.9%; 2025: 2.1%.
Core inflation 2023: 4.6%; 2024: 2.5%; 2025: 2.2%.

(2) RELEARNING INFLATION CONTROL

- Why are real policy rates still negative (or in the US barely positive)?
- Neutral policy rate: 2.50%
 - Neutral short real interest rate: 0.50%
 - Inflation target rate: 2.00%
- March 24, 2023:
 - Fed Funds Rate Target Range: 4.75-5.00%.
 - ECB: Interest rate on main refinancing operations: 3.50%.
 - BoE: Bank Rate: 4.25%.
 - BoJ: short-term policy rate -0.10%; target rate for 10-year JGB: 0.00%.
 - BoC: overnight rate 4.5%

(2) RELEARNING INFLATION CONTROL

- What does the Taylor Rule suggest?

$$i_t = r_t^N + \hat{\pi} + \alpha(\pi_t - \hat{\pi}) + \beta gap$$

- i : nominal policy rate; r^N : short neutral real interest rate; π : actual inflation rate;
 $\hat{\pi}$: target rate of inflation; gap : percentage difference between actual and potential real GDP.

Assume $\alpha = 1.5$; $\beta = 1$; $r^N = 0.50$; $\hat{\pi} : 2.00$

Short neutral nominal interest rate: $R_t^N = r_t^N + \hat{\pi} = 2.50\%$

[Goodhart \(February 2022\)](#); for U.S. $i > 6\%$; for UK $i \approx 5\%$

For US core PCED ; Eurozone core HICP; UK core CPIH; Japan CPI core core; Canada CPI-trim.

(2) RELEARNING INFLATION CONTROL

Table 1				
Taylor rule implied policy rates for five AE central banks				
			$\alpha = 1.5$	$\beta = 0.5$
	i (%)	R^N (%)	$\pi - \hat{\pi}$ (%)	gap (%)
Fed	6.40 (4.75-5.00)	2.50	2.60	0.00
ECB	8.05 (3.50)	2.50	3.70	0.00
BoE	7.55 (4.25)	2.50	3.70	-1.00
BoJ	4.70 (-0.10)	2.50	1.80	-1.00
BoC	6.10 (4.50)	2.50	2.40	0.00

(2) RELEARNING INFLATION CONTROL

- Note: Taylor Rule ignores financial stability considerations, including international repercussions of large/fast policy rate hikes by leading AE central banks (Fed & ECB especially).

- Solution: dynamic (partial adjustment) Taylor rule:

$$i_t = \gamma \left(r_t^N + \hat{\pi} + \alpha(\pi_t - \hat{\pi}_t) + \beta gap \right) + (1 - \gamma)i_{t-1}$$

$$0 < \gamma \leq 1$$

- For this to fit the data, $\gamma\alpha < 1$
- Why are the central banks still behind the curve – both as regards interest rates and balance sheet size?
 1. Persistent errors in analysis and forecasting. Were the Covid pandemic of March 2020 and Russia's war on Ukraine in February 2022 “black swan events”?
 2. Fear of domestic financial instability from rapid policy rate hikes and large asset sales.
 3. Fear of international repercussions (especially in externally vulnerable EMDEs).
 4. Fear of complicating the funding of fiscal deficits and adding to the interest burden of servicing the public debt - fiscal dominance.
 5. Unwillingness to engineer the slowdown in aggregate demand (quite possibly a recession) required to achieve a sustainable reduction in the inflation rate. Hoping for painless or immaculate disinflation. Unfortunately, this is the exception, not the rule.

(3) THE ENHANCED LOLR AND MMLR

- Financial stability is/should be the overriding mandate of any central bank. It is a precondition for the effective pursuit of price stability/a dual mandate.
 - Funding illiquidity (e.g. through a run on bank deposits or MM(M)F shares) manifests itself through a sharp increase in borrowing costs or a sudden vanishing of lenders at any affordable interest rate and other terms.
 - Market illiquidity (fire-sales at prices well below fair value or the complete absence of would-be purchasers at any price) is characterized by massive widening of bid-ask spreads and sharp reduction in transactions volumes.
 - LOLR provides funding liquidity through collateralized loans to selected counterparties. E.g. Fed's Bank Term Funding Program (BTFP).
 - MMLR provides market liquidity through outright purchases of selected financial instruments. Growing importance of NBFIs and markets for financial instruments in financial intermediation process implies enhanced roles of LOLR and MMLR.
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(3) THE ENHANCED LOLR AND MMLR

- Market illiquidity can also be addressed by LOLR lending to private market makers and/or other (normally active but temporarily absent) would-be purchasers. “Indirect MMLR” or “MMLR once removed”.
 1. Fed’s Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), September 2008 – February 2010.
 2. Fed’s Money Market Mutual Fund Liquidity Facility (MMLF), March 2020 – March 2021.

For both (1) and (2) Fed of Boston made non-recourse loans to eligible banks to facilitate the purchase of eligible assets from eligible MMFs. The loans were secured by the assets whose liquidity the facility aimed to boost.
- Other MMLR interventions
 - Bank of England’s APF (2009). Initially MMLR for high-quality private assets. Now includes QE and QT monetary policy activities. BoE Corporate Bond Purchase Scheme (2016, expanded 2020, part of APF).
 - Bank of England’s Covid Corporate Financing Facility (2020). Purchased commercial paper.
 - The Bank of England’s long dated gilt purchases from September 28, 2022 till October 14, 2022 to address the liability-driven investment (LDI) crisis.
 - The creation (but not yet activation) of the Transmission Protection Instrument (TPI) by the ECB, supplementing (or supplanting!) the (also not yet activated) Outright Monetary Transactions (OMT) programme, itself the successor of the Securities Markets Programme (SMP).
 - Fed’s Primary and Secondary Corporate Credit Facility (2020)

(3) THE ENHANCED LOLR AND MMLR

- Lessons learnt (we hope).
 1. Funding liquidity for systemically important entities and market liquidity for systemically important securities can dry up through “sunspot” or “run” equilibria, even when the fundamentals are sound. The LOLR and MMLR must be “on standby” permanently – they must be standing facilities
 2. In practice liquidity crunches with sound fundamentals (solvent counterparties and high-quality financial instruments) cannot be clearly and confidently distinguished from liquidity crunches due to unsound fundamentals (high insolvency risk of counterparties and low-quality financial instruments). The LOLR and MMLR will inevitably take counterparty risk, both market risk and default risk. They will have to be backed by (any losses fully compensated by) the Treasury/MoF. Example: Swiss central bank support for Credit Suisse in March 2023.
 3. Moral hazard is created (excessive risk taking is encouraged) when market participants know that the LOLR and MMLR is present. The same holds for deposit insurance – it weakens market discipline.
 1. LOLR and MMLR interventions therefore should be at penalty rates – unlike the Fed’s Bank Term Funding Program (BTFP). They must not be attractive when financial conditions are orderly.
 2. When financial conditions are orderly, stricter supervision and regulation of *activities, economic functions, risks and returns* is required.

(3) THE ENHANCED LOLR AND MMLR

Lessons learnt (continued):

4. LOLR and MMLR operations are severely constrained (often impossible) when foreign-currency-denominated loans and financial instruments are involved. Iceland's banking sector collapse in 2008. Argentina (May 2020); Sri Lanka (May 2022).
5. Sometimes sub-investment grade securities should be purchased by the MMLR (Greek sovereign debt as part of Pandemic Emergency Purchase Programme (PEPP), which has MMLR, QE (monetary policy) as well as fiscal dominance characteristics).
6. Credibility is key: OMT of ECB since 2012; zero purchases, highly effective. TPI has not yet been activated.
7. Additional lesson learnt for all regulators/supervisors: don't add to financial market confusion and unrest by making Additional Tier One (AT1) bonds (CoCos) junior to ordinary shares (Credit Suisse, FINMA March 19, 2023)!

Open questions:

1. Should the central bank intervene in the equity markets? BoJ ETFs and J-REITs since 2010.
2. Should the central bank intervene in key commodity markets?
London Metal Exchange, March 8, 2022, suspended nickel trading and cancelled all trades contracted earlier that day.
If intervention is deemed desirable, do not intervene directly as MMLR but indirectly as LOLR to private market makers/potential purchasers.

(3) THE ENHANCED LOLR AND MMLR

- The international LOLR is too often missing in action
 - Easier terms on standing liquidity swap lines for US dollars and the 5 other participating currencies between the Fed, BoC, BoE, BoJ, ECB and SNB (G7+).
 - Temporary dollar liquidity arrangements between Fed and 9 other central banks: Australia, Brasil, Denmark, South Korea, Mexico, Norway, New Zealand, Singapore and Sweden.
 - FIMA (Foreign and International Monetary Authorities Repo Facility) Created March 31, 2020; Made a Standing Facility on July 28, 2021. Central banks and other international monetary authorities with accounts at the Fed can repo U.S. Treasuries (if they have them). EUREP – ECB repo facility created June 25, 2020.
 - IMF: August 2021 U.S.\$ 650 bn SDR allocation; \$275 bn for EMDEs; \$21 bn for Low-income countries. Another installment likely to be required soon.

(4) THE DIGITAL TRANSFORMATION

1. Cyber security and the challenges of the quantum computing revolution; current encryptions may offer little protection against cyberattacks, including ransomware, by a quantum computer. True for all digital finance, not just DeFi.

2. CBDCs

Main drivers:

1. Financial inclusion
2. Global reserve currency role
3. Substitute for currency to eliminate ELB (and the criminality-promoting anonymity of currency holders⁰ if the CBDC is not a bearer instrument.

Open questions:

1. Centralized and account-based or decentralized (DLT) and token-based
2. If DLT is chosen, anonymity/pseudonymity of digital wallet owners – will blockchain be open access or permissioned?
3. Retail or wholesale (or both)
4. Possibility of more deeply negative interest rates if CBDC replaces physical currency – no more ELB.

(4) THE DIGITAL TRANSFORMATION

3. DeFi and the duck test: regulate activities, not entities – risks and returns, not labels.
 1. Distributed ledger technologies like the blockchain can be transformative if issues of scalability, energy use (associated with proof-of-work consensus mechanisms) and security (quantum computing) can be resolved.
 2. Bilateral transactions and smart contracts vs. the matching of large numbers of would-be buyers and sellers – market making. Is the blockchain only fit for OTC transactions or can it support exchange trading - a centralized market matching many buyers and sellers?
 3. Transmission and exchange of information – a key feature of much financial intermediation – not just executing trades.
 4. Private cryptocurrencies with freely determined market price.
 1. Fiat asset without intrinsic value. Extremely volatile and risky. Bitcoin and other free-floating cryptocurrencies as means of payment/medium of exchange for cross-border and cross-currency transactions (e.g. remittances).
 2. PoW consensus mechanism (mining) energy-intensive and may not scale well. Proof of Stake (PoS) protocols may solve that problem. Ethereum has made the transition,
 3. Anonymity/pseudonymity: ideal vehicles for illicit transactions? Transactions are in the public domain; beneficial owners of wallets may be anonymous/pseudonymous but traceable through transactions chain.
 4. Not a good idea to make it national legal tender because of its often extreme volatility (El Salvador).
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(4) THE DIGITAL TRANSFORMATION

- Stablecoins: should be supervised and regulated like checkable bank deposits (as should MMFs!). They should be allowed to pay interest (contrary to the EU's MiCA (Markets in Crypto-Assets) Regulation).
- Initial coin offerings (ICOs): should be regulated and taxed as initial public offerings (IPOs). These are securities.
- NFTs: Non-fungible tokens – cryptographic asset stored on a blockchain with a unique identification code and metadata. NFT data units can be digital files that represent ownership claims to anything. Trading in NFTs and other digital assets should be regulated and taxed like all trading in financial and real assets.

(5) THE INESCAPABLE FISCAL DIMENSION

- Central banks are beneficially owned by the government (typically the national Treasury or MoF).
 - Their profits accrue to the government.
 - They can provide loans, overdrafts and other credit facilities to the government (or other favored entities). They can purchase government debt.
- They can issue irredeemable “liabilities” with legal tender status. Some have a zero nominal interest rate.
- Their policy rates (and forward guidance) influence the cost of servicing the public debt.
- This makes them a highly attractive source of funding /influence target for fiscally-financially challenged governments.

(5) THE INESCAPABLE FISCAL DIMENSION

(1) Reasons for central bank purchases of government bonds:

1. “Old normal” (before ELB became a binding constraint). Routine open market purchases; part of the normal implementation of monetary policy in pursuit of price stability or dual mandate.
2. “New monetary policy normal”. When policy rate is constrained by the ELB, asset purchases (QE and QQE), yield curve control (YCC) and forward guidance are the only monetary policy instrument left.
3. MMLR operations. Even the most liquid markets can malfunction: between March 13 and July 31, 2020, Fed purchased U.S.\$1.77 trillion of U.S. Treasuries and U.S.\$892 billion of agency MBS. BoE gilt market purchases September 28/October 14, 2022 (£19.3bn; began unwinding on 29 November 2022; completed on 12 January 2023).
4. Monetary financing of government deficits and debt
 1. Public debt purchases and monetization consistent with the price stability mandate.
 2. Public debt purchases and monetization inconsistent with the price stability mandate

(5) THE INESCAPABLE FISCAL DIMENSION

(2). The budget constraint of the state and the temptation of monetary financing.

$$\dot{D}(t) = (r(t) - g(t))D(t) - (s(t) + \sigma(t))$$

D : net *non-monetary* debt of the consolidated general government and central bank – the ‘state’, ratio to GDP

r : real interest rate on the public debt

g : growth rate of real GDP

s : primary surplus of the state; ratio to GDP

σ : net monetary financing (seigniorage - change in stock of central bank money net of any interest paid), ratio to GDP

Note: meaningful public debt sustainability analysis (DSA) has to consider the consolidated accounts of the general government and central bank.

(5) THE INESCAPABLE FISCAL DIMENSION

- From the budget constraint of the state and the No-Ponzi Finance condition we get the intertemporal budget constraint of the state:

$$D(t) \leq PDV_t \{s(i); r(i) - g(i); i \geq t\} + PDV_t \{\sigma(i); r(i) - g(i); i \geq t\}$$

- $PDV_t \{x(i); r(i) - g(i); i \geq t\}$ is the expected present discounted value operator applied, at time t , to the infinite sequence of current and future values of x ; the discount rate is $r - g$.
- The outstanding stock of net non-monetary debt of the state can be serviced either painfully through higher current and future taxes and/or lower current and future public spending (s), or apparently painlessly through higher current and future seigniorage (σ).
- Problem: outside Japan, rapid increases in the monetary base invariably led to rapid inflation.

THE INESCAPABLE FISCAL DIMENSION

Monetary Base, % GDP, end-of-period				
	2007	2019	2021	2022
BoJ Currency	16.0	23	23	22.7
Deposits	0.5	73	104	94.7
Monetary base	16.5	96	127	117.4
Fed Currency	5.7	8.4	9.7	8.7
Deposits	0.3	7.2	17.6	12.2
Monetary base	6.0	15.6	27.3	20.9
ECB Currency	7.2	10.7	12.5	11.8
Deposits	4.0	15.1	34.9	30.0
Monetary base	11.2	25.8	47.4	41.8
BoE Currency	3.3	3.8	4.2	3.9
Deposits	1.5	21.4	42.7	40.5
Monetary base	4.8	25.2	46.9	44.4

(5) THE INESCAPABLE FISCAL DIMENSION

Central Bank Consolidated Total Assets (end of period)					
		2007	2019	2021	2022
Fed	US\$ billion	922	4,174	8,757	8,551
Fed	% GDP	6.4	19.5	38.1	33.6
Eurosystem	€ billion	1,508	4,671	8,564	7,956
Eurosystem	% GDP	16.1	39.0	69.5	59.6
BoJ	Yen trillion	111.3	587.1	723.8	703.9
BoJ	% GDP	20.6	81.2	131.4	126.5
BoE	£ billion	77.8	597.9	1,142.5	
BoE	% GDP	5.3	26.7	50.3	
Sources: Fed, ECB, BoJ, National Accounts Statistics, Fred					

(5) THE INESCAPABLE FISCAL DIMENSION

- Fed's holdings of Treasury securities (EOP): 2007: \$755 bn (5.2% of GDP); March 29, 2023: \$5,329 bn (20.9% of 2022 GDP) down from a peak of over 25% in 2021
- BoJ holdings of JGBs (EOP) March 2008: 12.6% of GDP; 2021: 96% of GDP. (Japanese General Government debt 1,290 trillion yen as of Dec. 2022; 258.3% of GDP. 43.3% of this held by BoJ (111.8% of GDP)).
 - Unrealized losses on the Bank of Japan's holdings of Japanese government bonds amounted to about 8.8 trillion yen (\$68.4 billion) at the end of 2022. Book value 564.1 trillion yen; market value 555.3 trillion yen. The 10-year bond yield is still capped at 0.5%. Much larger losses are likely once yield curve control (YCC) ends – SVB experience for the BoJ ...
- BoE holdings of Government Debt (EOP); 2007: £2.4 bn (0.15% of GDP); 2019: £495 bn (22.2% of GDP); Nov. 2021: £925 bn (40.7% of GDP); Feb. 2023: £649 bn (26.1% of 2022GDP).
- Euro area general government debt end of 2019: 83.9% of GDP; end of 2020: 97.0% of GDP; end of 2021: 95.6% of GDP; end of 2022 Q3: 93.0% of GDP.
 - Public sector bonds held under APP and PEPP end-June 2022: €4,258 bn (34.6% of 2021 GDP). March 2023, €4.194 bn (31.4% of 2022 GDP).
 - Cumulative net purchases under the PSPP as of 2023/03/31: €2,733 billion (20.5% of 2022 GDP).

(5) THE INESCAPABLE FISCAL DIMENSION

(3) Is there a painless $r < g$ solution to the public debt sustainability conundrum?

Brief answer: no. The era of extraordinarily low risk-free rates is coming to an end.

- Demographics will make for lower ex-ante private saving rates (ageing vs. old populations).
- Public sector saving rates likely to decline in many countries (political economy).
- Robust planned investment (capital-labor substitution; and technical change (automation, AI, robotics)).

The intertemporal budget constraint of the state remains a binding constraint. Future primary surpluses (and/or future seigniorage) will have to be generated or debt will have to be restructured.

(5) THE INESCAPABLE FISCAL DIMENSION

(4) When there is a conflict about monetary funding between the government and the central bank, the rule is that the government wins.

Possible exceptions:

1. Bundesbank (pre – 1999) – collective memories of hyperinflation 1922-23.
2. Possibility: ECB - 1 central bank facing 20 MoFs that may not agree on monetization priorities.

Reality: ECB behavior post-Covid consistent with fiscal dominance/capture.

THE INESCAPABLE FISCAL DIMENSION

- Two recent examples where central banks were forced to engage in monetization incompatible with price stability are Argentina and Sri Lanka. Another possible example of fiscal dominance is the ECB.

(5) Argentina since 2017

- September 2016 BCRA adopted an inflation targeting regime, to bring inflation down gradually from 41.2% (CPI) in 2016 to 5% in 2019. In December 2017, with annual inflation still above 20%, the BCRA raised the inflation target for 2018 from 8-12% to 15% and pushed back the 5% target to 2020. The BCRA abandoned its inflation targeting regime from October 2018. It is likely that government pressure drove these decisions of the BCRA since 2017.
- The Charter of the BCRA sets clear limits on the amount of financing the central bank can provide to the government. According to my calculations, monetary financing would have been capped at 4.54% of GDP in 2020. Monetary financing of the fiscal deficit was 7.4% of GDP in 2020.
- The monetary financing could not address the foreign-currency-denominated external debt problems of Argentina. The ninth sovereign default occurred on May 22, 2020.

(5) THE INESCAPABLE FISCAL DIMENSION

- An interesting issue in Argentina is the significant non-monetary domestic-currency-denominated debt issued by the BCRA. LEBACs, LELIQs, NOTALIQs etc. were 10.9% of GDP at the end of 2021. The central bank interest bill added 3.3% of GDP to the consolidated public sector deficit (what the IMF calls the BCRA quasi-fiscal cost).
- The projected path for inflation in the IMF Staff Report for the 2022 Article IV Consultation assumes, consistent with the limited fiscal capacity of the government, that inflation will only come down slowly from the 50.9% rate in 2021 to 38-48% in 2022, 33-44% in 2023 and 28-38% in 2024. In February 2023 the annual inflation rate was 102.5%.

(5) THE INESCAPABLE FISCAL DIMENSION

(6) Sri Lanka since 2019

- Badly affected by Covid pandemic (tourism and shipping costs) and Ukraine war (food and energy prices).
 - Flexible inflation targeting regime with target range 4-6%.
 - Trouble started in 2019, before Covid and Ukraine, when Sri Lanka implemented tax cuts that reduced central government total revenue and grants from an already low 12.6% of GDP in 2019 to 9.2% in 2020 and 8.9% in 2021. Central government deficit went from 8.0% of GDP in 2019 to 12.8% of GDP in 2020 and 11.4% of GDP in 2021. Net external financing of government deficit was 3.8% of GDP in 2019, -0.6% of GDP in 2020 and -0.9% of GDP in 2021. Net domestic financing went from 4.1% of GDP in 2019 to 13.3% of GDP in 2020 and 12.3% of GDP in 2021. A significant share of this net domestic financing was provided by the CBSL.
 - Growth of CBSL credit to central government and public corporations 53.6% in 2020, 26.5% in 2021 and 31.1% in 2022. Projected (as of March 20, 2023) to go down to 11.5% in 2023 and -0.8% in 2024.
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(5) THE INESCAPABLE FISCAL DIMENSION

- The CBSL monetized the government deficit (reserve money growth in 2021: 35.4%; 3.3% in 2023) and cut the Standing Deposit Facility Rate in 2019 from 8.00% in 2019 to 4.5% in July 2020 where it remained until August 2021.
- Inflation went from 3.5% in 2019 to 6.2% in 2020, 12.1 % in December 2021, 15.1% in February 2022 , 18.7% in March 2022 and 50.3% in March 2023. It is projected by the IMF to average 28.5% over 2023 and 8.7% over 2024.
- The official exchange rate depreciated gently from early 2019 until March 2022, when it depreciated sharply.
- The CBSL's monetization of the government's deficit could not address the problems of servicing the foreign-currency-denominated public debt. Gross international reserves went from US\$ 7.6 bn in 2019 to US\$ 5.7 bn in 2020, 3.3 bn in 2021 and US\$1.9 bn in 2022. Net international reserves turned negative, from US\$ 5.9 bn in 2019 to USD 3.5 bn in 2020 and US\$ - 334 million in 2021. Usable Gross Official Reserves were US\$ 462 mn at the end of 2022, a mere 0.2months of prospective imports of goods and services. On April 12, 2022, the MoF announced a temporary default on the external public debt, which stood at 78.0% of GDP (US\$ 58.7 bn) in 2022.
- Standing deposit facility rate (SDFR) raised by 700 bps to 13.5% on April 8, 2022 (now 15.5%) – still deeply negative in real terms. Standing Lending Facility Rate (SLFR) 16.5%.
- Political turmoil and social unrest make non-inflationary public debt sustainability an almost impossible task.
- IMF Sovereign Risk and Debt Sustainability Framework (SRDSF) not applied consistently to the consolidated accounts of the general government and CBSL, even in 2022.
- March 20, 2023, IMF approved a 48-month extended arrangement under the Extended Fund Facility (EFF) of \$3 billion.

(5) THE INESCAPABLE FISCAL DIMENSION

(7) Why is the euro area policy rate only 3.5%?

Does the ECB/Eurosystem knowingly engage in monetized public debt purchases that pose a material threat to its price stability mandate?

PEPP (March 2020 till March 2022, with reinvestment of maturing principal until at least the end of 2024). Envelope € 1,850 bn as of December 2020.

PEPP holdings as of 31 March 2023 (roughly constant since March 2022)

- €1,624 bn public sector securities (13.2% of euro area 2021 GDP; 12.2% of euro area 2022 GDP)
- Cumulative net purchases as at end-March 2023:
 - Greek sovereign debt: € 37.7 billion; 21.1% of Greek 2021 GDP
 - Portugal sovereign debt: €34.0 billion; 16.4% of Portuguese 2021 GDP
 - Italy sovereign debt: €289.7 billion; 16.0% of Italian 2021 GDP
 - Spain sovereign debt: €195.9 billion; 15.7% of Spanish 2021 GDP

(5) THE INESCAPABLE FISCAL DIMENSION

- Additional public debt purchases by Eurosystem through PSPP (part of APP) since November 2019 till end-March 2022: 4.1% of euro area GDP (this excludes Greece – sub-investment grade). Net asset purchases under the APP ended July 2022. Since March 2023, APP portfolio declines by €15 bn per month on average until the end of Q2, 2023, through partial reinvestment of the principal payments from maturing securities.
- Eurosystem sovereign debt purchases in 2020 and 2021 were 120% of net sovereign debt issuance.
- PEPP (unlike PSPP) permits purchases of sub-investment grade sovereign debt (Greece).
- PEPP (unlike PSPP) permits reinvestment of redemptions (maturing sovereign debt) in debt issued by other sovereigns (“reinvestment flexibility”).
- ECB also announced it would continue to accept Greek government bonds as collateral until at least the end of 2024, despite Greece sovereign debt not meeting the ECB’s minimum credit quality requirement.
- ECB more generally asserted its “ ... right to deviate from credit rating agencies’ ratings if warranted ...”
- I expect that the ECB will continue bond purchases targeted at high-risk sovereign debt (e.g., Greece and Italy). Its purpose is to support sovereigns that could face a sharp increase in borrowing costs when ECB policy rates are raised and that could even run the risk of being shut out of the market.
- This may, at times, have MMLR overtones. I expect these fiscal support (& at times fiscal rescue) operations to continue even when orderly markets have been restored if significant sovereign risk premia are present.
- Creation of TPI (Transmission Protection Instrument) in July 2022. Supposedly a MMLR facility targeting disorderly markets and protecting the transmission of monetary policy in the pursuit of price stability. User-friendly version of Outright Monetary Transactions (OMT) – does not require EFSF/ESM programme.

(5) THE INESCAPABLE FISCAL DIMENSION

(8) What is required for central bank operational independence in pursuit of price stability – to avoid fiscal dominance?

- Necessary (and often sufficient) for central bank operational independence in the pursuit of price stability is effective political support for low inflation, even when this is known to require higher taxes and/or lower public spending.
- It is in principle possible that a central bank, even though operationally independent – no fiscal dominance - knowingly engages in asset purchases, including the monetization of public debt and deficits, that may pose a material risk to price stability. The reason could be that another central bank mandate – financial stability – would be threatened if the asset purchases (and associated monetization) did not take place. Example: BoE emergency gilt purchases from September 28, 2022 till October 14, 2022.
- Technical gimmicks – e.g. turning the central bank into an orthodox currency board (see e.g. [Hanke \(2022\)](#)) - will not work if there is no effective political support for central bank operational independence: any central bank law or regulation that can be passed can be amended, repealed or ignored.
- What is *not* required is a prohibition on monetary financing of the government (e.g. Article 123 TFEU).

(5) THE INESCAPABLE FISCAL DIMENSION

- ECB and NCBs are banned from purchasing public debt in primary markets and from lending directly to government entities. Plain silly.
 - Ineffective. ECB and NCBs have engaged in massive targeted public debt purchases in secondary markets.
 - Potentially damaging; there are times when primary market purchases and/or direct credit facilities may be optimal (when there is a self-fulfilling fear and panic-driven run on the sovereign debt).
 - An operationally independent central bank must be able to resist government pressures for inflationary monetization (must be able to say “no”). It is not required to say “no” to requests for monetary financing that, in the opinion of the central bank, do not pose a threat to price stability. Monetization of public debt and deficits is not always evidence of fiscal dominance.

(6) CONCLUSION

Four demanding tasks for central bankers everywhere:

- (1) Many/most have to relearn inflation control – recognizing that painless/immaculate disinflation is unlikely to be on the menu.
- (2) The LOLR and MMLR responsibilities (and supervision and regulation responsibilities) are greatly enhanced as a result of the growing importance of NBFIs and financial markets in the financial intermediation process. There must be an in-house capacity for pricing a wide range of assets when markets are malfunctioning – to impose penalty terms.
- (3) The digital transformation is happening now. Most central banks will have a CBDC – 11 countries already do (including the Bahamas, Nigeria, Eastern Caribbean Union, Jamaica) others are close (China, India, Russia, Sweden, Ukraine, UAE, and Canada). DeFi and a wide range of new digital assets (including crypto assets) and digital business entities will have to be managed, regulated and supervised.
- (4) Central banks must be able to resist fiscal dominance - government pressure for lower policy rates and for monetary funding of the government - whenever, in the opinion of the central bank, this would pose a material threat to price stability and cannot be justified on financial stability grounds.