

How much equity capital should a central bank hold?

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Abstract

The mechanism to calculate how much reserves the RBI transfers to the Central Government has been at the forefront of debate amongst experts and policy makers. The present legal framework allows the RBI to choose what proportion of reserves it transfers to the Government. As a consequence, it has built up reserves that are higher than most other central banks hold. This paper presents the logic for why central banks might hold reserves. Drawing on cross country practises, it presents a discussion of the possible arrangements for transfer of reserves to the Government. Any institutional arrangement to determine a framework for reserves transfer must consider these options.

Key words: Central banking, seigniorage, risk capital

JEL Classification Codes: E5, E51, E58

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1. Introduction

The role of a central bank is different from that of a commercial bank. It issues money on behalf of the sovereign. The differences in the role played by a central bank also translates into differences in how we measure their 'surpluses' and estimate requirements for whether they need to hold risk capital. This debate is interesting for India as the mechanism for RBI to calculate how much money it transfers each year to the government has been discussed publicly only recently.¹ In this paper we find that in general, central banks have three ways of choosing how much money to transfer to the government. One, all its earnings are transferred to government and then based on the budget approved for the central bank, government transfers it money. Second, a certain amount of reserves expressed as a percentage of profit are held by the central bank depending on its needs and functions, decided by the law, and any earnings over and above it are transferred to the government. Third, there are laws duly enacted that lay down what percentage of central bank earning should be held and what should be transferred. This is not contingent on the capital position of the central bank. The law provides for a joint decision-making arrangement for the transfer of profit. In a handful of countries, there is central bank discretion on the proportion of profit to be transferred as dividends.

The arrangement between RBI and Government of India falls into the fourth model. The *RBI Act* allows the RBI to choose what amount it transfers to the government. It has consequently build up reserves that are higher than those of almost all central banks barring one which holds reserves to bail out banks. The annual transfer, called dividend in this case, has been a matter of contention between the government and RBI. In this paper we examine the logic and the legal arrangements for transfer from central banks to government in India and abroad.

The paper is organised as follows: Section 2 presents a discussion on central bank capital. Section 3 presents a discussion on the various models to transfer seigniorage income from central banks to governments. Section 4 describes the present legal and evolving position on holding of capital and reserves including the recommendations of RBI's internal groups on optimal capital to be held by the RBI. Section 5 describes the economic capital formulated by RBI to determine its optimal holding of capital. It also discusses some issues with the methodology to assess risk to determine the optimal level of equity capital. Section 6 concludes with some proposals on way forward.

2. Central bank capital

There are two schools of thought on holding of capital by central banks. One school of thought argues that central banks can have negative capital. The prime reason for this is that central banks have monopoly of issuing currency. Their liabilities are non-maturing and non-remunerated. Central banks also have access to current accounts covering the minimum reserve requirements. Thus central banks do not face the same liquidity challenge as private institutions. The authority to issue legal tender gives

¹ Ananth Narayan. *Understanding RBI's Balance Sheet: Is It Sitting On Excess Capital?* url: <https://www.bloomberquint.com/opinion/understanding-rbis-balance-sheet-is-it-sitting-on-excess-capital#gs.gvyo5Ww>.

central banks financial buffer in the form of seigniorage income.² Secondly, a central bank is really a part of the government. Its balance-sheet should then be thought of as part of the consolidated balance-sheet of the Government.

There are three approaches to measurement of seigniorage income.

1. Monetary seigniorage is defined as the net change in base money deflated by consumer price level.
2. Opportunity cost seigniorage is the 'opportunity cost' of money holders. It asks the question: What additional real income would individuals have earned if they had held interest-earning assets instead of non- interest-earning money?

Real opportunity cost seigniorage:

where B denotes total base money holdings, $\overline{r^P}$ is the representative nominal rate of return on assets other than base money and P is the consumer price level.

3. Fiscal approach: Focuses on both assets and liabilities³
4. Central bank revenue is interest earned by investing the resources obtained through past issuance of base money in interest-bearing assets:

$$S^{fiscal} = i * (a + b) + c + v + k; \text{ where}$$

$i * (a + b)$ is the income asset portfolio held by the central bank which includes goods outside the government sector (a) and government bonds held (b)

c is the request of the Government from central bank's revenues

v is the changes that occur in the portfolio of assets accumulated by previous editions of monetary base

k is the costs involved in managing the monetary base

The above formula is used to denote the total seigniorage. In modern fiat money economies, the monopoly of the issue of legal tender is generally assigned to an agency of the state, the Central Bank, which may have varying degrees of independence from the government of the day. The public has to hold cash as it is the *legal tender*.

The other school of thought argues that central bank needs to hold substantial amount of capital for the following reasons:

1. Financing of operating costs: A central bank could need reserves to finance its operating costs which could consist of payment of wages, salaries, the cost of premises and the cost of printing banknotes and minting coins.
2. Currency movements and composition of Central Bank assets: Central Banks in small open economies such as Norway tend to have greater risk

² The term 'seigniorage' is defined as the profits a central bank earns when it issues currency. The difference between the face value of currency note and its marginal cost of printing is equivalent to the face value of the currency as marginal printing costs are effectively zero (Willem H Buiter. *Seigniorage*. Working Paper 12919. National Bureau of Economic Research, Feb. 2007. doi: [10.3386/w12919](https://doi.org/10.3386/w12919). url: <http://www.nber.org/papers/w12919>)

³ [Ibid.](#)

of currency appreciation, as most of their central bank assets are denominated in foreign exchange. As a result, small open economies assume substantial currency risk. These countries therefore have larger capital requirements in order to address the risk of central bank losses due to changes in the exchange rate.

Losses could be incurred on the day-to-day management of foreign exchange reserves if market interest rates rise or if the country's currency is strengthened by the time the securities making up the central bank's forex reserves are realised. Depending on whether the foreign securities are retained till maturity or they are realised before maturity, the central bank could incur currency or both currency and interest rate risk.⁴

3. Bailing out banks: When banks are private and it is politically difficult for the Government to do so, it may ask the Central Bank to bail out banks. Since banks are privately owned, Governments avoid the political fallout of a bail-out by having Central banks take on the responsibility of assuming financial obligations and non-performing assets of banks.
4. Last resort functions: Last resort functions in the form of capital support, liquidity provision or market-making may involve sufficient financial exposure. The scale of last-resort interventions by central banks could also serve as a reason for holding seigniorage income. During times of crisis, collateral policies are relaxed to ensure supply of credit lines.⁵ The capital requirements are expected to be larger for banks entrusted with last resort functions.

Some studies point out that seigniorage income may be impacted during times of high inflation

1. Revenue from money creation may be impacted in times of high inflation, when a central bank is contracting liquidity.⁶
2. During high inflation, an inflation targeting CB may have to pay higher interest rates on its liabilities. If the assets are primarily denominated in domestic currency, this does not result in losses, however if the assets are primarily denominated in foreign currency, the interest rate on FCA may be lower than the interest paid on domestic liabilities—resulting in losses.⁷

⁴ Tomas Ernhagen, Magnus Vesterlund, and Staffan Viotti. *How much equity does a central bank need?* Aufsatz in Zeitschriften, Article in journal. In: Sveriges Riksbank economic review. Stockholm, 2002.

⁵ Bank for International Settlements. *Central bank finances*. Bank for International Settlements, 2013. url: <http://EconPapers.repec.org/RePEc:bis:bisbps:71>.

⁶ Reza Vaez-Zadeh. "Implications and remedies of central bank losses". In: *The evolving role of central banks*, IMF, Washington DC (1991).

⁷ Alex Cukierman. "Central bank finances and independence—how much capital should a CB have?" In: *Tel Aviv University* (2006).

3. Arrangements to transfer seigniorage income from central banks to governments

There are different arrangements in countries to transfer seigniorage income from the Central Banks to the Governments.

1. All earnings transferred and the central bank can draw on external resources.
2. Equity target (or equivalent that either (a) allows future surpluses to be retained to an unusual extent to cover losses and/or rebuild equity or (b) allows retentions to build buffers towards a target level
3. Retention of a set or restricted share of each year's profit (not contingent on the capital position)
4. Full bank discretion
5. Distribution smoothing
6. Joint decision

3.1 All earning are transferred and central banks can draw on external resources

Under this scheme, Central banks can draw from government if reserves are insufficient to absorb a loss for the year. The budget makes up for the deficiency. Countries that have such provisions are Korea, ECB, Peru Czech Republic and the US.

USA

Section 7 of the Federal Reserve Act defines the surplus distribution policy.

- 1 . Dividends And Surplus Funds Of Reserve Banks.
 - (a) Stockholder Dividends. In General. After all necessary expenses of a Federal reserve bank have been paid or provided for, the stockholders of the bank shall be entitled to receive an annual dividend of 6 percent on paid-in capital stock. *Dividend Cumulative*: The entitlement to dividends shall be cumulative.
 - (b) Deposit Of Net Earnings In Surplus Fund. That portion of net earnings of each Federal reserve bank which remains after dividend claims under subparagraph (1)(a) have been fully met shall be deposited in the surplus fund of the bank.
- 2 . Transfer For Fiscal Year 2000.
 - (a) In General. The Federal reserve banks shall transfer from the surplus funds of such banks to the Board of Governors of the Federal Reserve System for transfer to the Secretary of the Treasury for deposit in the general fund of the Treasury, a total amount of \$3,752,000,000 in fiscal year 2000.

- (b) Allocated By Fed. Of the total amount required to be paid by the Federal reserve banks under paragraph (a) for fiscal year 2000, the Board shall determine the amount each such bank shall pay in such fiscal year.
- (c) Replenishment Of Surplus Fund Prohibited. During fiscal year 2000, no Federal reserve bank may replenish such bank's surplus fund by the amount of any transfer by such bank under paragraph (a).

In summary, the Federal Reserve Act mandates the Reserve Banks to transfer excess earnings to the Treasury after providing for the cost of operations (including the payment of interest on reserves), the payment of dividends on member bank stock, and the reservation of an amount necessary to equate surplus with capital paid-in. Furthermore, the Board of Governors allows for the suspension of remittances to the Treasury if excess earnings are insufficient to meet the abovementioned costs.⁸

3.2 Equity target

This scheme provides for additional retentions when the central bank's financial strength has been depleted. A capped amount⁹ of the surplus is retained in order to achieve the targeted outcome.

Under the 100% retention scheme, all new profits are retained until reserves are rebuilt. Countries that provide for such schemes are: Switzerland, Chile, ECB, Mexico, Iceland, Finland, Singapore. For instance, in Switzerland, standard distributions are halted if target is below reserve. In Iceland, if equity is less than 2.25% of lending and domestic securities assets of credit system, 2/3 of profits are retained.

Thailand

The Bank of Thailand (BOT) Act allows the Central Bank to generate an ordinary reserve amounting to 25% of the profits, with the remaining net profit being paid in as state revenues. However, other reserves for particular purposes are created only with the explicit approval of the Government. Any distribution of profit into these reserves are subject to approval of the Government.

Section 14 of the Act states that:

The net annual profits of the BOT after deduction of accumulated loss, if any, shall be provided in the following order for:

1. *ordinary reserve amounting to 25 per centum;*
2. *other reserves for particular purposes, as specified by the BOT Board, upon the approval of the Minister.*

Any remaining net profits after the BOT's operation in paragraph one shall be paid in as state revenues.¹⁰

⁸ See Section 7 of the Federal Reserve Act

⁹ In some countries, even 100% retention is provided for to replenish the central bank's reserves.

¹⁰ See section 14 of the Bank of Thailand Act

Section 13 of the Act clarifies the composition of reserves. It states that:

The reserves of the Bank of Thailand shall consist of; (1) ordinary reserves intended to cover possible loss; (2) reserves derived from the revaluation of assets and liabilities; and (3) other reserves for particular purposes as may be established by the BOT Board upon the approval of the Minister.

3.3 Retaining a certain percentage of profits and transferring the rest to the Government

Under this scheme, either a percent of each year's surplus is retained (Sweden, Ireland, UK, South Korea, Chile, Netherlands, Iceland, Japan, Finland, South Africa) or an absolute amount is retained (Canada). The transfer is not contingent on the capital position of the central bank.

South Korea

The Bank of Korea Act allows the Central Bank to allocate 30% of net profit every year to the reserves. Article 99 of the Act states that:

1. *The Bank of Korea shall allocate to the reserves annually thirty percent of any net profit after allowance has been made for the depreciation of assets.*
2. *The Bank of Korea may, with the approval of the Government, establish reserve funds for specific purposes when net profit remains after compliance with the provisions of Paragraph (1).*
3. *After making allocation of its net profit in accordance with the provisions of Paragraphs (1) and (2), the Bank of Korea shall pay what remains of the net profit into the General Revenue Account of the Government.¹¹*

Finland

Section 21 of the Bank of Finland Act states that:

Half of the profit, following allocation of the monetary income that has accrued within the European System of Central Banks, shall be transferred to the reserve fund. The remaining profit shall be made available for use in accordance with the needs of the state. The Parliamentary Supervisory Council may decide on use of the profit for other purposes if this is justifiable because of the Bank's financial condition or the size of the reserve fund. Parliament shall decide on the disposal of the profit made available for use in accordance with the needs of the state.

If the Bank's annual accounts show a loss, the loss must be covered out of the reserve fund. If the reserve fund is insufficient to cover part of the loss, the uncovered part of the loss may be left temporarily uncovered. Any profits in subsequent years shall be used first to cover such uncovered losses.

3.4 Full bank discretion

Countries that provide full bank discretion are: Germany, India, Malaysia, Singapore, Slovakia, South Africa, Turkey. Such schemes are generally subjected to "usually provided for by bankers" test. e.g., India, Malaysia, Singapore, South Africa. In Germany, it is subjected to a "reasonable commercial judgement" test.

¹¹ See Article 99 of the Bank of Korea Act

3.5 Distribution smoothing

Sweden and Switzerland provide for distribution smoothing. Dividends are paid from a five year trailing average of adjusted income. This protects directly against that part of the distribution asymmetry associated with high variance in P&L but may still mandate large distributions well into a longer-lasting episode of weakness in the central bank's finances.

3.6 Joint decision

Joint decisions are taken by the central bank in liaison with the Ministry of Finance. In Australia, Treasurer, after consultation with RBA Board, may determine amounts to be set aside for contingencies or into Reserve Fund. Article 30 of the *RB Act* states:

“(1) Subject to subsection (2), the net profits of the Bank in each year shall be dealt with as follows:

(aa) such amount as the Treasurer, after consultation with the Reserve Bank Board, determines is to be set aside for contingencies; and

(a) such amount as the Treasurer, after consultation with the Reserve Bank Board, determines shall be placed to the credit of the Reserve Bank Reserve Fund; and

(b) the remainder shall be paid to the Commonwealth.”

In New Zealand, Bank must recommend dividend; Minister must determine dividend. Both recommendation and determination are published.

4. Current Indian legal position on holding reserves and capital

The global financial crisis has brought to the fore the issue of adequate capital for central banks. Some central banks have developed risk-based methodologies to assess the adequate level of capital.¹² Based on the scale of responsibility, most central banks maintain some form of capital supplemented by profit-sharing and dividend smoothening mechanisms with the central government. The *RBI Annual Report 2014-15* mentioned that it is seeking to put in place an ‘economic capital’ framework based not only on the risks it is exposed to but also ‘contingent risk’ which arise from its role in fostering monetary and financial stability.

The provisions of the *RBI Act* governing reserves are as under:

1. Section 46 of the *RBI Act* creates the ‘Reserve Fund’ of Rs.5 crore.
2. Section 47 of the *RBI Act* says: ‘After making provision for bad and doubtful debts, depreciation in assets, contributions to staff and superannuation funds and for all other matters for which provision is to be made by or under this Act or which are usually provided for by bankers, the balance of the profits shall be paid to the Central Government.

¹² Martin Fraser. “The Reserve Bank’s capital adequacy framework”. In: *Reserve Bank of New Zealand Bulletin* 76 (3 2013). url: <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Bulletins/2013/2013sep76-3fraser.pdf>

3. Section 58 of the *RBI Act* says: The Central Board may, with the previous sanction of the Central Government by notification in the official Gazette make regulations consistent with this Act to provide for all matters for which provision is necessary or convenient for the purpose of giving effect to the provisions of this Act.

Clause (m) of Section 58 states: the manner and form in which the balance-sheet of the Bank shall be drawn up, and in which the accounts shall be maintained;

Thus the law requires RBI to create a Reserve Fund of Rs 5 crore. Further, RBI can make regulations governing the manner and form in which the balance-sheet of the Bank shall be drawn up but all regulations require the previous sanction of the Central Government.

RBI has two main sources of income. RBI gets seigniorage income from its assets in the issue department. This income is in the form of interest and (\pm) revaluation changes. The second source of income is from the banking department wherein the RBI earns interest and (\pm) revaluation from its portfolio of LAF securities. RBI accounts show RBI's income split over domestic and foreign securities. RBI's expenditure is primarily on account of three heads, establishment expenses, agency charges and security printing.

4.1 Capital held by the RBI

The RBI act gives the RBI paid up equity capital of Rs. 5 crore. However, under the vague provision of Section 47 of the RBI Act, 1934, the RBI created discretionary operational reserves and revaluation accounts to account for fluctuations on its assets side as well as unforeseeable expenses. There are five major reserves operated by the RBI that have quasi-equity like functions. They are:

1. Contingency Reserve (CR)
2. Asset Development Reserve (ADR)
3. Currency and Gold Revaluation Account (CGRA)
4. Investment Revaluation Account (IRA)
5. Foreign Exchange Forward Contracts Valuation Account (FCVA)

CR and ADR are reserves that are created from the RBI's realised seigniorage and operational profits. The Asset Development Reserve (ADR) set up in 1998 was created out of profit to meet internal capital expenditure and make investments in subsidiaries and associated institutions. The Contingency Reserve (CR) represents the amounts added on a year to year basis for meeting unexpected and unforeseen contingencies. The Currency and Gold Revaluation Account (CGRA) reflects the unrealised gain / losses on revaluation of Foreign Currency Assets and Gold which are credited / debited to this account. The Investment Revaluation Account (IRA) reflects the unrealised gains / losses arising on marking foreign dated securities to market which are credited / debited to this account.

There is no legal clarity on the *purpose* for which these reserve funds may be created, the proportion of profits that may be transferred to these reserve funds, the proportion of profits that may be distributed to the Government and the manner in which these decisions are to be made. Thus, the current legal framework is inadequate and non-transparent on these matters. During 1996-97, an Informal Group was set up within the RBI under the Chairmanship of Mr. V. Subrahmanyam, Executive Director, Reserve Bank of India to study and recommend suitable guidelines for allocation of RBI's capital and profits.

The Group identified three risks as having an impact on the RBI's balance sheet. First, risks arising out of monetary/exchange rate policy compulsions, requiring intervention by the RBI in the securities, money and forex markets. Second, risks arising out of revaluation of foreign assets and gold. Third, systemic risks and requirements relating to central bank (developmental role), internal frauds, unforeseen losses, etc. The Group led by Mr. V. Subrahmanyam recommended a target of 12% of total assets to be set aside for CR by the RBI. In 2004, an expert committee led by Usha Thorat recommended reserves to be maintained at 18% of total assets.¹³

The reserves have been maintained at 10% of the assets book on average for the last 10 years. In 2013-14, a technical committee of the RBI Board reviewed the adequacy of reserves and surplus distribution policy and found that balances in CR and ADR are in excess of the buff needed, hence there was no need to make any further transfers to CR and ADR.¹⁴

Table 1 shows the various components of the capital base over the last thirteen years. The capital base of RBI is the sum total of its capital (statutory reserves of Rs 5 crore), CR, ADR, CGRA, IRA, FCVA.

From June 30, 2015, the format of the Balance-Sheet and Profit and Loss statements has been changed. Till June 30, 2015, transfers made to CF and ADF were deducted from the income to arrive at net income. This system of reporting has changed w.e.f. June 30, 2015. The transfers to CF and ADF are reported as 'Provisions' under a head under expenditure to account for transfers to the Contingency Fund (CF) and the Asset Development Fund (ADF). Few noteworthy trends in relation to CF are as under:

- During 2013-2014, 2014-15 and 2015-16, no transfer was made to the CF.
- We see a decline in the outstanding amount of CF as on June 30, 2015 and June 30, 2016. The decline in CF of Rs 0.38 billion as on June 30, 2015 and Rs 14.3 billion as on June 30, 2016 was due to charging of the debit balance in the Forward Contract Valuation account on account of MTM losses on forward contract.
- As on June 30, 2017, an amount of Rs 131.40 billion was transferred to CF and an amount of 65.85 billion was charged to CF on account of
 - (i) MTM loss of Rs 29.63 billion on valuation of forward contracts and
 - (ii) debit balance of Rs 36.22 billion in the IRA-FS.

Transfers made to Government are also included in the equity of the RBI. Table 2 shows the total equity of the RBI including the transfers made to the Government of India.

In the balance-sheet of the RBI, these components are shown as Schedule 3 under the head "Other liabilities and provisions". For the year ending June 2018, the economic capital constituted 28% of the total assets. The biggest component of the capital base was CGRA (the revaluation reserves). It constituted 68% of the capital base and 19% of the total assets.

¹³ Navneeraj Sharma Abhishek Anand Josh Felman and Arvind Subramanian. "Paranoia or Prudence?: How much capital is enough for the RBI?". In: *Economic and Political Weekly* Vol. 53. Issue No. 48 (Aug. 2018).

¹⁴ <https://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=1130>

Table 1 Components of RBI's capital (in Thousand Crore)

	Capital	CR	ADR	CGRA	IRA	FCVA	Total
2004	0.5	55.25	5.59	51.28		0.57	113.19
2005	0.005	56.22	5.78	62.28		0.01	124.29
2006	0.005	62.34	6.47	26.91		0.00	95.72
2007	0.005	73.28	7.59	86.79		0.00	167.66
2008	0.005	93.77	9.56	21.72		0.01	125.06
2009	0.005	127.20	12.77	163.21			303.18
2010	0.005	153.39	14.08	198.84		0.03	366.345
2011	0.005	158.56	14.63	119.13	9.37	0.02	301.71
2012	0.005	170.73	15.87	182.29	4.27	0.00	373.16
2013	0.005	195.41	18.21	473.17	12.22	2.40	701.415
2014	0.005	221.65	20.76	520.11	2.48	1.70	766.70
2015	0.005	221.61	21.76	559.19	3.2	0.00	805.765
2016	0.005	220.18	22.76	637.47	52.42	0.00	932.835
2017	0.005	222.82	22.81	529.94	57.09	0.0	832.665
2018	0.005	232.1	22.81	691.64	13.28	3.26	963.09

Table 2 RBI capital and transfers made to GOI (In Thousand Crore)

Year	Total of reserves	Transfers made to GOI	Total equity capital
2004	113.19	-	-
2005	124.29	-	-
2006	95.72	-	-
2007	167.66	-	-
2008	125.06	15.01	140.07
2009	303.18	25.01	328.19
2010	366.34	18.76	385.1
2011	301.71	15.01	316.72
2012	373.16	16.01	389.17
2013	701.41	33.01	734.42
2014	766.70	52.68	819.38
2015	805.76	65.8	871.56
2016	932.83	65.8	998.63
2017	832.66	30.6	863.26
2018	963.09	50	1013.09

In other similarly placed economies the share of revaluation reserves in total balance-sheet is small. For example the balance-sheet of Banco Central Do Brazil shows that revaluation reserves constitute 0.013% of the balance-sheet.

The *Economic Survey, 2015-16* showed that RBI's holding of shareholder equity¹⁵ to assets is second only to Norway. A survey of 54 major developed and emerging market economies for 2016-17 shows that the ratio of capital plus reserves to total assets varies from over 40% in the case of Norway to negative capital in the case of Israel, Chile and Thailand. The median ratio is seen to be 8.4%. India is seen as an outlier amongst the major central banks.¹⁶

¹⁵ Shareholder equity is defined to include capital plus reserves (built through undistributed retained earnings) plus revaluation and contingency accounts.

¹⁶ Abhishek Anand and Subramanian, see n. 13

5. RBI's methodology to assess capital

RBI Annual Report 2014-15, mentioned that the RBI has formulated a draft framework to assess its capital and internal reserves position in a structured and systematic manner. The proposed methodology was referred to as the Economic Capital (EC) framework.

5.1 Overview of proposed methodology

RBI maintains that it needs to keep reserves to deal with risks and to maintain a higher rating. RBI's determination of capital is based on its assessment of risk that it may face:

The risk based framework proposed by RBI is as follows:

1. Market risk: The risk of losses in on and off-balance sheet positions arising from adverse movements in valuation of assets of the RBI, including foreign reserves, gold and g-secs. The proposed framework uses the Basel 2.5 Stressed Value at Risk (S-Var) approach, which is widely used in the commercial setting to measure the risk of loss on a specific portfolio of financial assets.
2. Credit risk: The risk that a borrower will default on any type of debt by failing to make required payments. The proposed framework uses the Basel II Standardised Approach to calculate credit risk, which is amended as per discussions with BIS officials.
3. Operational risk: The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events: The proposed framework uses the Basel II Basic Indicator Approach, under which the capital charge for operational risk is 15% of the average of the previous three years of positive annual gross income.
4. Contingent risks: Three types of contingent risk are considered.
 - a. Emergency Liquidity Assistance (ELA) risks arising from RBI's LOLR role (considered for Scheduled Commercial Banks only): Liquidity shortage is simulated to generate scenarios, ranging from the liquidity crisis affecting top 5 networked banks to the entire banking system.
 - b. Monetary policy risk due to management of inflation (calculated based on scenario analysis)
 - c. Risks arising from currency stabilisation operations (calculated based on scenario analysis).

5.2 Issues with the proposed methodology

The RBI's framework of target equity capital is based on an assessment of financial and other risks faced by the Bank. The RBI undertook a stressed Value at Risk (S VaR) and scenario exercise to determine the appropriate level of equity capital to be maintained by the Bank.

- *Issues with the methodology*: The risk methodology (addressing market; credit; operational; and contingent risk) adopted by the RBI to estimate

"safe levels" of Economic Capital has the following underlying problems:

1. Methodology for commercial banks is applied inappropriately to central banks:

The proposed methodology to estimate RBI's EC requirements is based mainly on international standards established for commercial banks (i.e., Basel II, 2.5 and III). These standards therefore focus on the risks that are most significant to commercial banks, not all of which are significant (or significant in the same proportion) for central banks. For example, central banks take far less credit risk than private firms while taking much higher currency risk exposure. International standards set for commercial banks are therefore not appropriate in the context of a central bank's credit risk calculation. Mostly central banks use a VaR model with a 99% or 95% confidence interval to determine the optimal level of capital.¹⁷

A recent research applies the VaR model and confidence intervals chosen by other central banks to derive at an optimal level of capital estimate for RBI. The authors derive an optimal capital level of 14%. If they take extreme risk averse assumptions not applied elsewhere, they arrive at an optimal capital estimate of 27%. They also undertake an econometric analysis of the determinants of capital held by central banks. Their analysis suggests that the RBI holds 16-22% more capital than the typical country after controlling for the potential determinants of central bank capital.¹⁸

2. Risk overestimation:

The proposed methodology assumes scenarios in which there are high stress levels, and calculates current EC requirements based on the risk resulting from these high stress levels even though they are not reflective of the medium term outlook. For example, the proposed ELA risk is calculated under "scenarios ranging from the liquidity crisis affecting the top 5 networked banks to the entire banking system". Under these stressed scenarios, ELA risk is significantly increased, even though the risk is not reflective of the medium term outlook. As a result, the risk calculations give capital requirements that are much higher than necessary for the current situation.

In addition there are some questions on the methodology:

1. While articulating the need for a framework to retain equity capital RBI maintains that it wishes to maintain itself as AAA+ rated counterparty. In this context it would be useful to ask RBI:
 - (a) The present rating of RBI
 - (b) The entities carrying out such rating
 - (c) The process of rating followed
 - (d) Comparable ratings of other Central Banks, especially other emerging economies.

¹⁷ Abhishek Anand and Subramanian, see n. 13

¹⁸ *Ibid.*

2. RBI is concerned about the legal liabilities arising from section 17 and 18 of the *RBI Act*. In this regard the following information would be helpful in assessing the degree of risk and the consequent need for holding reserves.
 - (a) The nature of lending under Section 17 is collateralised lending within a limited time at the discretion of the Central Board of the Bank. What kind of risk was estimated for such lending by the Bank?
 - (b) The amount of historical losses the Bank has suffered in the past under- taking its obligations under Section 17 including the timing and value of the ten highest losses suffered.

The amount of losses suffered by the Bank in carrying out its functions under Section 18. The process by which the risk emanating out of the legal liabilities under Section 18 was estimated. The timing and value of the ten highest losses suffered

3. RBI mentions that there is a need to provide considerable degree of support given our “Emerging economy and developing market status” but for the purpose of calculating risks under Emergency Liquidity Assistance, it focusses on problems which are generally seen in European economies where Central Banks are supposed to provide liquidity assistance and re-capitalise banks.
- *India is an outlier:* As per RBI’s EC framework document, RBI is one of the largest holders of capital and retained earnings amongst emerging economies (even with the assumption that valuation buff are retained by the central banks). RBI’s capital and retained earnings, as a percentage of balance-sheet is higher than those of its emerging economy peers, such as Brazil (0.85%), Chile (-16.21%), Indonesia (3.50%), Korea (2.20%), Malaysia (3.43%), South Africa (0.89%) and Turkey (3.16%). (See Appendix II.)

Central Banks in small open economies such as Norway tend to have greater risk of currency appreciation, as most of their central bank assets are denominated in foreign exchange. As a result, small open economies assume substantial currency risk. These countries therefore have larger capital requirements in order to address the risk of central bank losses due to changes in the exchange rate.

- *Remote possibility of bailing out banks:* RBI mentions that it may have to perform the role of bailing out banks in a crisis like situation. However, not only has the RBI never been asked to do so in the past, the large share of public sector ownership of banks precludes the Government requiring the RBI to play such a role as the recapitalisation of PSU banks by the Government is politically acceptable.

Further RBI expresses the concern that it may have to take bad/illiquid assets as collateral in the process of providing liquidity to a fragile banking system. Under Section 18 of the *RBI Act*, the RBI can fix the terms and conditions for lending and avoid the possibility of bad collateral.

6. Proposals for way forward

1. Only one reserve: As the present *RBI Act* requires the presence of only one Reserve Fund of Rs.5 crore, the first task should be to achieve compliance with the law.
2. A central bank is not a normal bank. There are many central banks in the world running with negative values of 'equity capital' and this does not induce any stress. The central bank is really part of the government, it is reasonable to consolidate the central bank's balance sheet with the government's broader balance sheet.
3. Any proposal dealing with capital structure and dividend must be discussed with the Government. Recently, the RBI in consultation with the Government has constituted an expert committee to review the Economic Capital framework of the RBI.¹⁹ The Committee is tasked to propose a framework for determination of optimal capital and transfer of profits to the Government. The framework could envisage:
 - An equity target for the RBI (either an absolute amount or a proportion of profits); to be maintained at all times and the balance to be transferred to the Government. If reserves fall below target, a proportion of the profits may be retained to achieve the target;
 - An absolute amount of profit or a proportion of profit to be retained by the RBI and rest to be transferred to the Government.
 - A joint decision-making for the purpose of assessing the proportion of profits to be retained and the proportion to be transferred to the Central Government.

Table 3 Capital and reserves as percent to total assets

	Amount in '000	Percent to total
Currency and Gold Revaluation-Contingency Fund	691.6	19.1
Asset Development Fund	232.1	6.4
Others	22.8	0.6
	49.7	1.4

4. The government stands ready to recapitalise RBI when required. This can be coded into the law or through an MoU between the Government and the RBI. There is no need for RBI to build up large reserves to protect against this eventuality.
5. Risk management framework: RBI is one of the largest holders of capital and retained earnings.²⁰ Table 3 expresses reserves as a percentage of RBI's balance-sheet. It shows that more than 19% of the total assets are held as currency and gold revaluation reserves. The justification for holding large proportions of balance-sheet size as reserves could be that RBI is taking too much risk on its balance-sheet. There is a need to re-think the RBI's risk management framework as an alternative strategy to locking up excess capital.

¹⁹ See https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=45826

²⁰ Abhishek Anand and Subramanian, see n. 13.

Central banks take on risks as a result of their investment activities, monetary policy operations and sometimes, as lender of last resort credit.²¹ As investors, central banks tend to be conservative. In a situation of a trade-off between risk and return, they favour assets with low credit risks at the cost of moderate returns. This implies that central banks tend to favour short-term liquid instruments. Another instrument of risk management is the collateral policy. When central banks advance credit, as part of monetary policy operations or as a lender of last resort, to minimise the probability of loss, the collateral should be safe.

If RBI is concerned about the risk of loss emanating from its role as the lender of last resort, it could specify the collateral requirements as mandated under Section 17 of the *RBI Act*.

RBI may be subject to currency risk and interest rate risk. Since a major proportion of the total assets of RBI are held in foreign currency, the main risk of loss arises due to appreciation of rupee.

An appreciation of rupee leads to a decline in the rupee value of foreign assets. RBI can and does intervene in the foreign exchange market to prevent appreciation of the rupee. From a risk management perspective, a view needs to be taken on how much appreciation of the exchange rate the RBI is willing to accept without intervention. This view should guide the future holding of capital to guard against exchange rate risk.

Interest rate risk arises due to increase in foreign and domestic interest rates. Risk due to increase in foreign interest rate is small due to short-maturity of foreign currency assets. Holdings of domestic securities may be subject to risk arising due to increase in domestic interest rates. This can be addressed by holding short-term government securities.

²¹ Erkki Liikanen. *Central banking and the risk management of central banks: what are the links?* Sept. 2017. url: <https://www.bis.org/review/r170929b.pdf>

A Appendix II: Empirical evidence on how much reserves/surplus/risk capital is held by Central Banks

Annex-II
(Cf., para 3.1)

Cross-country survey of CB capital practices and norms

S.No.	Country/ Jurisdiction	Capital + Retained earnings as % B/S	Valuation buffers as % BS	Risk Methodology @ #	Risk transfer mechanism ^ #	Distribution Policy ^^
1.	Australia	7.92	5.04	VaR/ RWA		A
2.	Austria	10.90	6.98	VaR		D
3.	Belgium	6.92	9.81	VaR/ES	Yes	A
4.	Brazil	0.85	0.02	Sensitivity Analysis	Yes	B
5.	Canada*	0.14	0.34	VaR		C
6.	Chile	-16.21	0.00			Negative eq-
7.	Denmark	11.01	1.70	ES		D
8.	Euro Area (ECB)	8.31	10.76	VaR/ES		C
9.	Finland	11.71	3.13	VaR		B
10.	France	2.52	13.44	VaR		B
11.	Germany	2.51	13.56	VaR		C
12.	Hong Kong	21.13	0.44			Not found
13.	India	9.5	22	VaR proposed	Yes	A
14.	Indonesia	3.50	7.45			C
15.	Israel	-15.70	1.88			C
16.	Italy	7.16	9.77	VaR		C
17.	Japan	2.09	0.00			B
18.	Korea	2.20	-1.42		Yes	B
19.	Malaysia	3.43	12.53			C
20.	Mexico	-3.44	0.00			Negative equity
21.	Netherlands	4.97	10.63	ES/ALM	Yes	B
22.	New Zealand	10.56	0.57	VaR	Yes	A
23.	Norway**	40.00		Risk Model		D
24.	Peru	0.52	-1.12		Yes	Negative equity
25.	Philippines	1.08	-1.02			Not found
26.	Poland	-1.25	3.34	VaR		C
27.	Russia	1.28	12.69			B
28.	Singapore	10.61	&	Risk Model		C
29.	South Africa ***	0.89	0.02 (31.75)		Yes	B
30.	Spain	2.80	2.37	VaR		B
31.	Sri Lanka	8.74	0.48			C
32.	Sweden	10.56	10.57	VaR		D
33.	Switzerland	15.38	0.00			D
34.	Thailand	-14.05	24.04			Negative equity
35.	Turkey	3.16	6.39			B
36.	UK	0.59	0.16		Yes	B
37.	USA	1.27	0.00		Yes	B

[^] Losses caused by the ELA extended by the NCBs of the ESCB are often seen to be guaranteed by the sovereign. However, we indicated a RTM only against those CBs for which we have confirmed information.

^{^^} **Surplus Distribution Key** – **A:** CB retains a part of the surplus but does not have a numerical rule; **B:** CB retains a percentage of the total surplus; **C:** CB retains surplus on the basis of a graduated rule; **D:** Some form of surplus-transfer smoothening is adopted.

@ Central banks using VaR/ ES for capital equity assessment also supplement the same by stress-test/ scenario analysis.

Where information has not been found in public domain, the columns are kept blank

* Though Canada has a graduated rule, the condition for assessment for adequacy of reserves was satisfied considerably long time back and now entire profits are transferred to Government.

** Norges Bank: The equity ratio is calculated excluding the 'Government Pension Fund – Global' on its balance sheet, the risk returns of which are borne by the Government.

*** The Gold and Foreign Exchange Contingency Reserve Account (GFECRA) on the SARB balance sheet, which represents primarily net revaluation profits and losses of gold and foreign exchange, are for the account of the South African Government.

& Singapore: The provision for diminution in value of securities/ forex could not be separately identified within the general head for provisions and, therefore, not shown.

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