SEYCHELLES

TECHNICAL ASSISTANCE REPORT – STRESS TESTING THE CENTRAL BANK BALANCE SHEET

November 2023

This Technical Assistance Report on the Seychelles was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed in October 2023.

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**International Monetary Fund
Washington, D.C.**

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Stress Testing the Central Bank Balance Sheet

November 2023

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GLOSSARY

AML/CFT	Anti-Money Laundering and Counter Financing of Terrorism
ARIMA	Autoregressive Integrated Moving Average
CBST	Central Bank Stress Testing
DAA	Deposit Auction Arrangement
EAD	Exposure at Default
ECB	European Central Bank
ECL	Expected Credit Loss
FVTPL	Fair Value Through Profit or Loss
FX	Foreign Exchange
GDP	Gross Domestic Product
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
LELGD	Large Enterprise Loss Given Default
MCM	Monetary and Capital Markets Department
MSMEs	Micro, Small, and Medium Enterprises
OLS	Ordinary Least Squares
PD	Probability of Default
PSRCLF	Private Sector Relief Credit Line Facilities
SCR	Seychellois Rupee
SDF	Stochastic Discount Factor
TA	Technical Assistance

PREFACE

At the request of the Central Bank of Seychelles (CBS), a Monetary and Capital Markets (MCM) Department mission visited Victoria, Seychelles, from July 17 to 27, 2023, to assist the authorities in stress testing the CBS balance sheet.

The mission met with the Governor, Deputy Governors, Directors of the Research and Statistics, Banking Services, Risk Management, Legal, Communications, and Financial Markets Divisions/Units, and Deloitte South Africa (the CBS's external auditor). The mission wishes to thank the CBS for their cooperation, productive discussions, and their hospitality.

The CBS has developed a robust risk management framework. The CBS has a risk management function, detailed risk management operational guidance, and a statement of risk appetite and tolerance. A credit impairment policy governs the computation of expected credit losses. The financial statements provide details on exposures to credit, interest rate, exchange rate, and liquidity risks. Finally, to our knowledge, the CBS is among the few emerging markets' central banks that conduct a comprehensive stress testing exercise.

Financial reporting is generally good but could be improved in two ways. Sensitivity analysis for *other price risks* could be expanded to differentiate the impact of market factors from managerial decisions. Disclosures on *Other Balances and Placements and Financial Assets at Fair Value Through Profit and Loss (FVTPL)* could be enhanced to further improve transparency.

The CBS balance sheet is weak, due to the cost of carrying FX reserves. As the central bank of a small open economy, the CBS must maintain a high level of foreign exchange (FX) reserves (as insurance against external shocks) that have a carry cost. The impact on the financial statements is limited because the CBS remunerates only a fraction of its liabilities. This is, however, tantamount to passing on the cost of the insurance to the monetary policy counterparties (banks), hampering monetary policy transmission and, thus, could undermine price stability. Even without remunerating policy liabilities, the net interest income has not been enough to cover operational costs over the past few years.

The conditions of CBS lending in Seychellois rupees (SCR) also contributed to weakening the CBS balance sheet. The provision of long-term, low-(zero)-interest rate loans, while relatively small compared with FX holdings, and partially unsecured loans to domestic counterparties during the COVID-19 pandemic required fair valuation and provisioning that weighted on the CBS's capital. They also generate less income than what they cost to re-absorb.

Without recapitalization, the CBS's financial strength relies on some degree of financial repression and operational expense control. Remunerating the reserve requirement at the policy rate to cancel financial repression would tank the CBS's capital, although the cost of full sterilization of only excess reserves with Deposit Auction Arrangements (DAAs) appears manageable. Conversely, capping the growth of operational expenses to forecast inflation would improve the CBS's capital based on retained earnings.

The CBS's financial strength is exposed to inflation risk. Regarding the impact of macro variables, the CBS's capital would decline if inflation were unexpectedly high. In contrast, the CBS's capital appears less exposed to a severe economic downturn.

An efficiency review should be completed to identify operational expense savings and cost recovery options. A simple international comparison of cost to GDP or a multivariate efficiency scoring based on a stochastic frontier analysis points to possible efficiency gains. By types of

expenses, average salary, and currency cost appear below comparators', but headcount is higher. An efficiency review, i.e., a comprehensive review of the cost of the central bank operations, would identify possible savings and cost recovery options. Each business line should be examined, but emphasis should be given to unfunded mandates and activities that deviate from core missions.

Multiyear budget planning would support the CBS's balance sheet strength. A five-year budget plan would help control the growth of operational expenses, possibly capping their growth to forecast inflation.

A capital injection is necessary to strengthen the CBS's balance sheet. The income stream of the CBS should be strengthened, through an increase in the authorized capital, to cover operational costs and the carry cost of the FX reserve. In addition, the profit distribution rule should be revised to allow the CBS to retain all distributable earnings if statutory capital is below the target level of 10 percent of monetary liabilities. As of July 2023, the mission estimated that between SCR 125 and SCR 785 million in new capital, depending on the scenario, should be injected for statutory capital to converge to the minimum of 10 percent of the monetary liabilities at the five-year horizon. The capital injection could take the form of cash or government securities issued under the same conditions as those that would have been necessary to raise the cash in the market (i.e., marketable government securities).

A communications strategy should be prepared to bolster public support for the recapitalization plan. Communications should explain the causes of the losses, reiterate the commitment to the policy objective regardless of financial considerations, and present the solution devised to address the financial weakness (recapitalization and profit retention). Communications on the latter should be coordinated between the *principal* (the Ministry of Finance—MoF) and the *agent* (the CBS) to explain the measures taken by each party, including financial support through recapitalization (MoF) and cost rationalization/recovery (CBS). In addition, the types and channels of communication would depend on the targeted audience, with some segments more attuned to financial issues (e.g., banks and foreign counterparties) than others (e.g., the general public). Finally, a defensive Q&A should be prepared to answer the typical questions on recapitalization, including questions such as why is recapitalization a priority? Or why isn't the central bank just printing money?

Table 1. Key Recommendations		
Recommendations and Authority Responsible for Implementation	**Priority**	**Timeframe**
Financial Reporting		
Differentiate the impact of market factors from managerial decisions in the sensitivity analysis of other price risks in the annual financial statements.	Medium	March 2024
Expand financial statements' disclosures to include information on the nature of, and risks to, *Other Balances and Placements* and *Financial Assets at Fair Value Through Profit and Loss*	Medium	March 2024
Revise the profit distribution rule to allow the CBS to retain all distributable earnings if the statutory capital is below the target level of 10 percent of monetary liabilities.	High	March 2024
Amend the CBS Act to set the authorized capital at SCR 550 million and review it as necessary, but at least every 10 years, for statutory capital to converge toward the target level of 10 percent of monetary liabilities.	High	March 2024
Stress Testing		
Recapitalize the CBS up to the minimum capital with cash or marketable securities.	High	December 2028*
Reduce reliance on financial repression to strengthen the CBS financial position by absorbing excess reserves via Deposit Auction Arrangements and reducing the reserve requirement ratio.	Medium	March 2024
Operational Cost		
Conduct an efficiency review to identify possible savings in operational expenses and cost recovery options.	High	March 2024
Adopt a five-year CBS budget in which the growth of operational expenses would be capped to forecast inflation.	High	December 2023
Communications		
Prepare a communications strategy to explain the need for recapitalization and the measures taken to address the issue. A defensive Q&A should be part of the strategy.	High	December 2028
Add a forward-looking component to risk disclosures, including a forecast of equity and stress scenarios.	Medium	March 2024
* At the time of the mission, the recapitalization needs ranged from 0.4 to 2.6 percent of GDP depending on the scenarios. The recapitalization horizon was assumed to occur by the end of the stress test horizon, not necessarily in 2023.		

I. INTRODUCTION

1.   **The CBS and the Ministry of Finance are discussing the need for recapitalization of the CBS.** The CBS Act (the Act) prescribes automatic recapitalization, with marketable securities, if the general reserve of the CBS is exhausted. For ex-post accountability, the National Assembly has the option to request that the Board and the external auditors report and explain the cause for the losses. CBS staff is stress-testing the CBS's balance sheet to inform the decision of the MoF. Latest results show that while the automatic recapitalization provision would not be triggered in 2023, statutory capital would continue to be well below the target level set in the Act (i.e., 10 percent of monetary liabilities) and what is generally observed at other central banks.

2.   **The CBS balance sheet is exposed to several risks.** First, as a small open economy, Seychelles is exposed to external shocks, which require maintaining a relatively high level of FX reserves as insurance. FX reserves have a carry cost due to the difference between the FX and the local currency interest rate. Second, the CBS is exposed to credit risk on the sovereign and monetary policy counterparties, including unsecured exposures vis-à-vis the latter (although small). Finally, the CBS is subject to carry cost due to long-term, interest-rate-free loans provided to local banks for on-lending during the COVID-19 pandemic.

3.   **The capital of central banks is insurance against financial losses.** Determining the adequate level of this insurance requires answering the following questions: (i) what gains/losses are expected; and (ii) how much of the risk should be covered? The degree of loss coverage depends on the policymaker's risk appetite, which is expected to be limited. Therefore, adequate capital should absorb possible losses (risks). Finally, the adequate level of capital should inform the profit distribution rule, i.e., no distribution if capital is below adequacy.

4.   **Different from private institutions, central banks should be solvent, but "policy" solvent rather than "financially" solvent.** Compared with other institutions, central banks are not liquidity constrained and have the privilege of issuing interest-rate-free debt instruments (i.e., currency in circulation) that have been issued for interest-bearing assets (i.e., generating seigniorage). In the case of Seychelles, the Act prescribes that statutory capital, which comprises authorized capital and general reserves, should be at least 10 percent of the monetary liabilities. The policy solvency test would, thus, assess whether the CBS has enough income for its capital and general reserve (statutory capital) to comply with the legal minimum target at the policy horizon, e.g., five years or end-2028.

5.   **The mission applied stress testing concepts to the CBS balance sheet.** Equity is projected based on the forecasts of (i) balance sheet items; (ii) provisioning for risks; and (iii) realized profits. Satellite models are used to forecast provisions for expected credit losses, currency in circulation, and operational costs based on macroeconomic variables, including inflation, GDP growth, the exchange rate, and the policy rate. The latter is determined based on a

rule that has an inflation objective. Then, the *expected* equity path is stressed for (i) deterministic macroeconomic scenarios; and (ii) at-risk inflation and GDP growth.

6.   The mission assessed the efficiency of the CBS operational expense based on an international comparison. International comparators consist of 90 central banks that publicly disclose their financial statements. The comparison goes from simple metrics, such as cost as a percentage of GDP, to efficiency scoring based on a stochastic frontier analysis to assess the cost efficiency of the CBS while controlling for factors that can justify different cost structures. The most complex methods aim at factoring in the diseconomies of scale of a small, island economy.

7.   The rest of the report is organized as follows: Section II focuses on financial reporting. Section III covers balance sheet stress testing. Section IV carries out the international efficiency scoring. The final section deals with communications around losses and recapitalization.

II.   FINANCIAL REPORTING

A.   Financial Disclosures

8.   The CBS prepares its financial statements in accordance with International Financial Reporting Standards (IFRS). Financial statements are finalized and published within the statutory deadline of three months after the end of the year. The CBS has sufficient in-house capacity in the financial reporting function and established policies and procedures to ensure compliance with key standards, including for valuation and impairment under IFRS 9 *Financial Instruments*.

9.   While the financial statements are aligned with IFRS requirements in all material respects, disclosures could be further improved. The following improvements should be considered:

- Sensitivity analysis for *other price risks* could be enriched by decomposing the impact of market factors (other than exchange rates) and managerial decisions (e.g., effective duration of the securities portfolio). Such analysis would aid in further explaining gains/losses arising from the fair valuation of foreign financial assets held at fair value through profit or loss (FVTPL).

- Disclosures on *Other Balances and Placements* and *Financial Assets at FVTPL* could be expanded to allow users of the financial statements to better understand the nature of, and risks to, these financial instruments. Disclosures could include information on the type of assets and the average interest rate and duration of the portfolios like the disclosure on *Investment Securities*). In addition, disclosures on the Private Sector Relief Credit Line Facilities (PSRCLF) should be expanded to include the maturities of the loans, e.g., average duration of outstanding loans. These enhancements would increase the transparency of the financial statements.

10.   The ideal balance sheet structure should provide a consistent and reliable stream of income and the tools necessary for implementing monetary and financial stability policies. The current structure of the CBS's balance sheet provides some of these characteristics. Table 2 presents a summary of the CBS's balance sheet as well as the interest income and expense associated with the key categories, excluding revaluation gains and losses, realized or not.

Table 2. Balance Sheet and Interest Allocation[1]
(millions of SCR as of December 31, 2022)

	Assets		Interest Income (realized)			Liabilities		Interest Expense	
Foreign Reserves	8,548	80%	91.63	66%	Currency in Circulation	1,658	15%	-	0%
Government of Seychelles	1,187	11%	19.43	14%	Government Accounts	1,880	18%	-	0%
Advances to Staff and Local Banks	242	2%	27.33	20%	Monetary Policy Liabilities	5,496	51%	8.59	44%
IMF	483	5%	-	0%	IMF Borrowings	701	7%	10.88	56%
Other Assets	261	2%	-	0%	Other Liabilities	198	2%	-	0%
						9,932	93%	19.47	100%
					Equity	789	7%	-	0%
	10,721	100%	138.39	100%		10,721	100%	19.47	100%

Source: IMF Mission based on the Central Bank of Seychelles's 2022 year-end financial statements.

11.   The CBS's COVID-19-related lending to banks and other financial institutions undermined its financial autonomy. The CBS and the government established the PSRCLF as part of the country's response to the economic effects of the COVID-19 pandemic. The loans were interest free, initially had maturities up to three years, but later extended to eight years and were only partially secured through a government guarantee provided to the CBS. Banks and other financial institutions bear the full credit risk from borrowers.[2] As of end-December 2022, the outstanding balance was SCR 187 million, just under 2 percent of CBS's total assets. There are three implications of zero-interest rates and a partial government guarantee:

- First, the CBS incurred fair value losses at initial recognition of the assets due to the zero-interest rate.

- Second, the expected credit losses (ECLs) provision on these loans should be increased to account for the uncollateralized credit risk exposure, which currently is not covered.

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[1] Interest income on the PSRCLF loans is calculated using the effective interest rate method in line with IFRS.

[2] The PSRCLFs comprise a scheme for micro, small, and medium enterprises (MSMEs) and for large enterprises (LEs). The banks and other financial institutions on-lend CBS loans to MSMEs and LEs at preferential interest rates and use all repayments from these loans to reimburse the CBS. The government guarantee covers 70 and 50 percent of the loan principal to MSMEs and LEs, respectively.

- Finally, zero-interest rates are inconsistent with the CBS's interest rate corridor and, therefore, could undermine the central bank's monetary policy stance and blur the line between monetary policy and government's fiscal policy.

12.   The CBS's income is driven by the cost of maintaining foreign assets as insurance against external shocks. Foreign assets typically yield less than the domestic currency liabilities.[3] Interest income remained positive because the CBS remunerated only a small fraction of its monetary liabilities. Accordingly, the cost of carrying the FX is transferred to the banks and, ultimately, to their customers, including the government. The period of low interest rates in major reserve currencies reduced net interest income to the point where operational expenses were not being covered (Figure 1). Consequently, statutory capital weakened, leaving the CBS with little buffer for future shocks.

Figure 1. Historical Trend in CBS's Income
(millions of SCR)

Source: IMF Mission based on the Central Bank of Seychelles's historical financial statements.
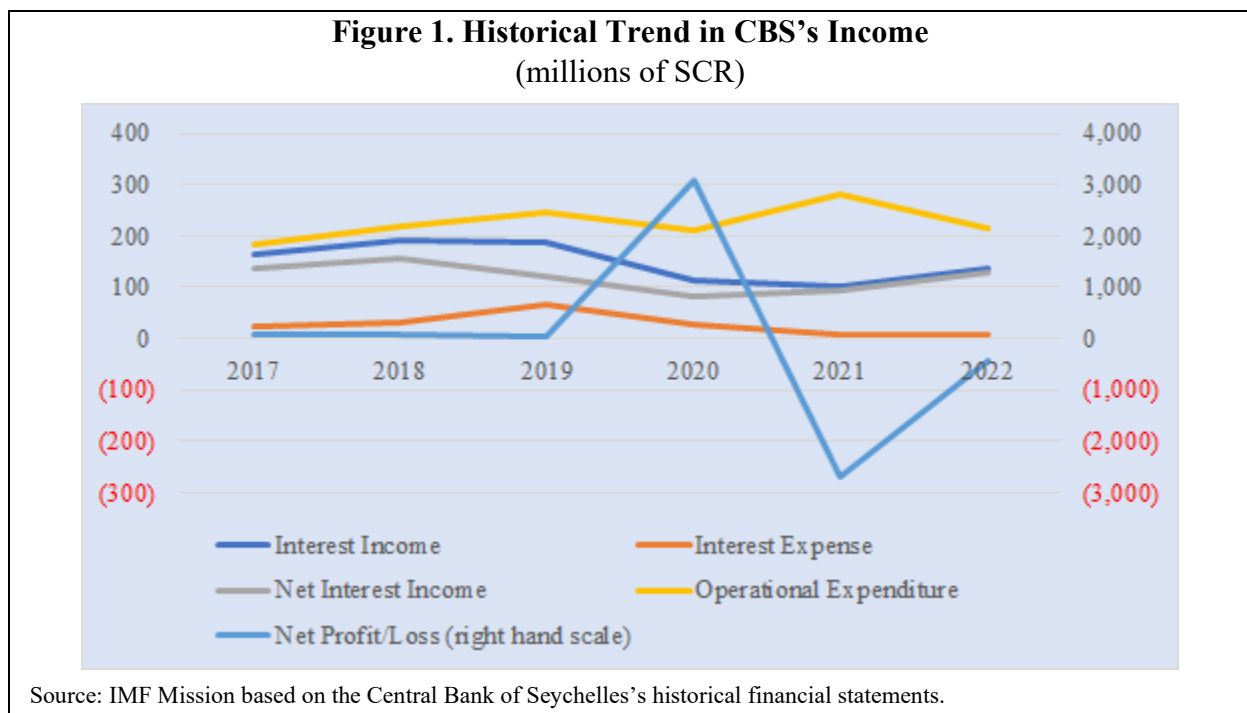
C.   Capital Structure and Profit Distribution

13.   The CBS's balance sheet capital structure is broadly aligned with best practices. The Act sets the target statutory capital level as a percentage of monetary liabilities (i.e., 10 percent) and clearly segregates it from revaluation reserves. Figure 2 provides an overview of the CBS's capital (equity) structure. If the general reserve accumulates a negative balance, the government is required to restore its value to zero by transferring marketable securities to the CBS.[4]

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[3] The domestic liabilities are the counterparties of the FX reserves.

[4] The Act defines "marketable securities" as securities matching the prevailing interest and tenure of outstanding government securities. They should be equivalent in terms of maturity and interest rate to those that the government

(continued...)

Appropriately, the CBS does not distribute unrealized gains, because this would monetize these amounts. The law also includes a mechanism to protect the CBS from negative unrealized revaluations.

<figure>
Figure 2. Central Bank of Seychelles Capital Structure

Total Capital
- Statutory Capital
  - Authorized Capital
  - General Reserve
- Reserves
  - Revaluation Reserve
  - Actuarial Reserve

Source: IMF Mission.
</figure>
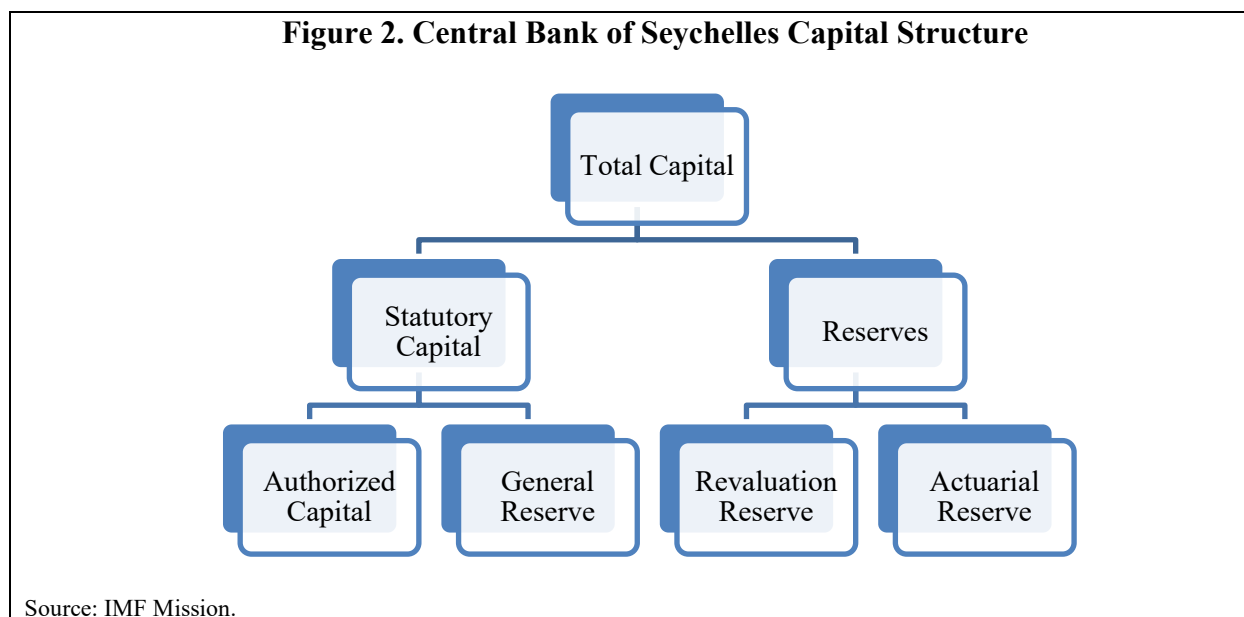
14.   The Act allows the CBS to retain distributable profits up to 10 percent of monetary liabilities. The statutory capital is increased through the allocation of 50 percent of distributable earnings until the target is reached, of which 3.33 percent shall relate to authorized capital and the remaining 6.67 percent to the general reserve.[5] This creates a buffer against negative capital. However, as of December 31, 2022, the statutory capital stood at only 2.73 percent of total monetary liabilities (3.26 percent at end-2021), of which authorized capital was 2.09 percent and general reserve 0.64 percent. Once established, authorized capital cannot be distributed or reallocated—this mechanism provides the CBS with a permanent reserve, which protects it against negative capital. The general reserve is used to absorb realized losses and can be reallocated to revaluation reserves when such becomes negative.

15.   That said, provisions on capital, reserves, and profit distribution could be strengthened. While authorized capital has increased since the Act was enacted in 2004, through retained earnings, it remains low in comparison with the target level and other central banks (generally about 7 percent of monetary liabilities). The current income stream of the CBS does not cover its operational cost and the carry cost of FX reserves. To strengthen the CBS finances, the following measures should be considered, including some requiring changes to the Act (see

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would have experienced if it issued in the market to raise the cash for the recapitalization. For instance, the Treasury currently issues mainly one-year maturities about 75 basis points above the policy rate.

[5] Per Section 14 of the CBS Act, the initial authorized capital of the CBS was established as SCR 1 million. The authorized capital has been fully paid.

Annex V for a draft proposal of the relevant articles), whose revision was underway at the time of the mission.

- *Upfront recapitalization.* To strengthen income, the authorized capital should be increased through a capital injection, either in the form of cash or marketable securities. The mission estimates that between SCR 125 and SCR 758 million in additional authorized capital is required for the statutory capital to converge to the target level over a five-year horizon (Section III). The securities, likely of one-year maturity, will be fully or partially rolled over at maturity[6] at the prevailing conditions in the market at the time of the rollover.

- *Recapitalization rule.* The authorized capital would be fixed at SCR [550] million. An automatic recapitalization would be triggered if statutory capital is expected to decline below SCR [550] million. The recapitalization amount should put it back on track to reach the minimum of 10 percent of monetary liabilities in the medium term. Authorized capital would be reviewed as necessary, at least every 10 years.

- *Profit distribution rule.* The profit retention mechanism should be strengthened to allow the CBS to retain all distributable earnings until statutory capital reaches the target level of 10 percent of monetary liabilities.

III.   FORECASTING THE CENTRAL BANK OF SEYCHELLES EQUITY

A.   Modeling Risks

16.   The CBS balance sheet is exposed to several financial risks, including credit, interest rate, and exchange rate risks. The CBS employs quantitative methods to manage these risks while adhering to IFRS 9 *Financial Instruments*. Currently, the CBS balance sheet is asset driven, with few interest-bearing liabilities. In this context, the balance sheet is highly exposed to potential shocks that reduce the quality of its assets and impair interest earnings. To engender and maintain a prudent approach to financial risk management, the CBS manages credit, interest rate, and exchange rate risks using several models to measure such risks. This technical assistance (TA) looks to augment this approach with several forward-looking components that incorporate a proactive approach to risk measurement and mitigation. The risk management unit of the CBS periodically assesses these different financial risks (with the addition of liquidity risks) faced by the CBS and recommends actions to mitigate these risks. The time horizon of this assessment, however, is only one year, which limits the extent to which risks are extrapolated and measured.

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[6] The amounts not rolled over are paid in cash to the CBS.

Credit Risk

17.   **Credit risk is currently managed using a credit rating-based approach to calculate the expected credit losses.** IFRS 9 requires modeling expected losses on all assets, including FX and sovereign exposures. ECLs are not currently material for the CBS, but their forecasting, based on expected macroeconomic conditions, is a key component of forward-looking risk management. This is mainly because of the structure of its balance sheet—total assets are dominated by FX investments (Table 1), the management of which adheres to strict policies of short-term investments in institutions of high credit worthiness. Most SCR-denominated assets are Treasury bills.

18.   **Expected credit losses are computed using the standard probability of default (PD) approach.** This approach includes measures of the loss given default (LGD) and the exposure at default (EAD), as follows:

$$ECL_t = PD_t \cdot LGD \cdot EAD$$

Where EAD is constant and can be set equal to the fair value of the instrument using the risk-free discount rate.[7] LGD is derived from the concept of recovery rate, R, where $R = 1 - LGD$. Recovery rates for corporate bonds can be easily obtained from sources such as Bloomberg. Conversely, the recovery rate for sovereign bonds can be difficult to calculate for individual sovereigns, due to the small number of sovereign defaults compared with corporate defaults. Nonetheless, several studies estimate regional LGDs, which can be used for respective countries.[8] PDs can be calculated using several methods—the CDS-implied PD, discount-implied PD, and credit-rating-based PD methods. The CBS employs a combination of the credit-rating-based approach and discount-implied approach, while this TA proposes the use of the CDS-implied PD approach.

19.   **The rating-based approach, which the CBS predominantly employs to calculate PDs, is obtained using a mapping methodology.** Tables mapping the rating category to the historical default probability are available from major rating agencies. The CBS uses this approach to obtain PDs for both local and foreign investments. Credit ratings for foreign investments have been stable over the past decade. In contrast, the sovereign credit rating for Seychelles has fluctuated between B and BB- since 2010. The last downgrade occurred during 2020, reflecting the COVID-19 economic fallout. While this rating-based approach is an accurate

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[7] The risk-free rate is used to avoid double counting credit risk in both discount rate and the ECL (Ernst & Young (2018). "Applying IFRS: Impairment of Financial Instruments under IFRS9").

[8] The two references are (i) Edward (2015). "Sovereign Default, Debt Restructuring, and Recovery Rates: Was the Argentinean 'Haircut' Excessive." NBER Working Paper; and (ii) Moody's (2011). "Sovereign Default and Recovery Rates, 1983-2010." Edward (2015) shows that the historical average of haircut rates on sovereign bonds for African countries during 1978-2019 is 46.5 percent, and, equivalently, the recovery rate is 53.5 percent. Moody's (2011) documents that the average historical recovery rate on sovereign bonds is 53 percent. Hence, we use 53 percent.

and effective method, it is not well suited to incorporating macroeconomic variables in a forward-looking context. It is generally quite difficult to establish an econometric link between credit ratings and macroeconomic variables, due to the infrequent changes in credit ratings and the wide (and inconsistent) range within which macro variable changes do not change the credit rating from one rating category to another.

20.   The CBS also employs a second option—the discounted cash flow (DCF) method—to obtain PDs for financial assets measured at fair value through profit and loss. The fair value difference between a risk-free discount rate and the default-risk-embedded discount rate (i.e., bond premium) can be considered the ECL assuming that LGD = 100 percent.[9] The bond premium could then be linked with macroeconomic variables, as done with the CDS (credit default swap) spread, but this requires individual information on all investments in a portfolio.

21.   The CDS-implied PDs are well suited to the objective of this TA. This approach is ideal for incorporating forward-looking components, due to the ease with which CDS spreads can be conditioned on macroeconomic variables and scenarios. The CDS-implied PD approach is also an accurate depiction of market-implied PDs for sovereign debts, because payoffs are directly linked to the event of underlying sovereign default. Sovereign CDS spread reflects the default probability of sovereign and the recovery rate, as follows:[10]

$$spread_t = (1 - R_{CDS}) \cdot \lambda_t$$

Where λ_t is the default intensity.[11] For example, $1 - \exp(-\lambda_t) \approx \lambda_t$ is one-year default probability. The recovery rate for sovereign CDS, R_{CDS}, is often assumed among market participants to be equal to 25 percent.[12]

22.   The sovereign CDS spread can be forecast to obtain future values of the CDS-implied PDs. The forecasts of the CDS spread are obtained in two steps. First, historical values of the CDS spreads are conditioned on macroeconomic variables, such as inflation, output gap,

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[9] Consider the zero-coupon bond with T-year maturity. The fair value under risk-free discount rate is $\exp(-rT)$, while the fair value under the $\exp(-(r + \lambda)T)$. $diff = \exp(-rT)(1 - \exp(-\lambda T))$. The second term is equal to the default probability from today to the maturity T. Given the assumption of 100 percent $\exp(-rT)$, the difference is the ECL.

[10] The exact formula is given by $spread_t = \int_t^{t+T} ds \, (1 - R)\lambda_s \exp(-(r_t + \lambda_t)s) \, / \int_t^{t+T} ds \exp(-(r_t + \lambda_t)s)$ in continuous time framework. Since the relation between the CDS spread and the default intensity is nonlinear, we need to solve the default intensity given the CDS spread at each time period given a simulated path. As it is computationally intensive, and our main goal is to reflect the macroeconomic environment to the default probability, we rely on the approximate formula.

[11] For a definition of credit intensity, see Duffie and Singleton (2013). "Credit Risk: Pricing, Measurement and Management."

[12] Pan, J., and K. Singleton (2008). "Default and Recovery Implicit in the Term Structure of Sovereign CDS Spreads," *The Journal of Finance,* Vol. LXIII, No 5.

and the public debt per GDP ratio. Second, estimated coefficients are determined by and combined with forecast values of the macroeconomic variables to calculate future values of the CDS-implied PD. For simplicity, it is assumed that the relationship between the CDS spread and the macroeconomic variables are linear. The fitted value of the regression captures the historical dynamics of the CDS spread well.

$$spread_t = \alpha_0 + \alpha_1 \pi_t + \alpha_2 (y_t - \bar{y}) + \alpha_3 \omega_t + \varepsilon_t$$

Where inflation is given by π_t, output gap is $(y_t - \bar{y})$, and public debt to GDP is given by ω_t. According to the results of the estimation, $\alpha_0 = 0.009$, $\alpha_1 = 0.012$, $\alpha_2 = 0.033$, and $\alpha_3 = -0.0439$.

23.   In this TA, the CBS balance sheet was subject to credit-risk stress tests that use scenario-based forecasts of macroeconomic variables. In this context, ECLs are recalibrated using the CDS spread-implied PD approach and projected over the forecast horizon. The forecast of the ECLs will reflect the scenario-based paths of the macroeconomic variables, which essentially allows the stress testing of the equity of the CBS from a credit-risk point of view. A deterioration in macroconditions will be assumed over the forecast horizon, which in turn drives higher values in the ECL for each asset and lower statutory capital. Note that nine balance sheet items apply an ECL calculated by the CBS.[13] The sovereign CDS spread ECL implied will only be calculated for three of these assets—the stock of Treasury bills, PSRCLF loans, and staff loans—all of which constitute domestic assets.[14]

24.   The CBS also provides ECL on foreign assets, which are not modeled by this TA. The remaining six balance sheet items are foreign cash assets, which will continue to be subject to the rating-implied ECL, with the ECL growing in tandem with the size of the respective asset in a linear manner. Table 4 shows the calculations for the sovereign CDS spread-implied ECLs on the domestic assets.

Table 3. Calculated ECLs Implied by Sovereign CDS Spread for Domestic Assets (Percent of monetary liabilities)				
	Treasury Bills	PSRCLF	Staff Loans	Total
2023	2.37	0.74	0.53	3.64
2024	1.94	0.60	0.42	2.95
2025	1.55	0.48	0.34	2.37
2026	1.15	0.36	0.25	1.76
2027	0.76	0.24	0.17	1.17
2028	0.36	0.11	0.08	0.56
Sources: IMF Staff calculations and CBS.				

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[13] This does not include the assets measured at FVTPL, which has an implicit ECL applied in the fair valuation adjustment.

[14] The sovereign CDS spread was used as a proxy given the unavailability of data for PSRCLF and staff loans. The CBS also employed a similar approach to compute ECLs but used a rating-based approach.

Interest Rate Risk

25.   The CBS balance sheet is exposed to interest rate risks. The current approach of the CBS is to measure the impact on statutory capital from a 1.0 percent change in domestic and foreign interest rates. In this TA, this method will be extended to provide further stress tests to the balance sheet. Based on the structure of the CBS balance sheet, there are two main channels through which interest rate changes impact the balance sheet.

- Policy interest rate changes—as derived from a forward-looking Taylor rule reaction function—impact interest rate earnings received from domestic investments and interest rate paid on interest-bearing liabilities, including interest paid on the absorption of excess reserves.

- Foreign interest rate changes—as derived from deterministic scenarios developed in this TA—significantly impact the measurement of financial assets measured at FVTPL.

26.   The domestic interest rate risk depends on macroeconomic variables. The CBS operated in a liquidity surplus of SCR 3.6 billion at end-2022, and this should be remunerated to transmit monetary policy (although currently it is not). The CBS's finances should, thus, be exposed to the possible need to increase its policy rate, if required, to address inflationary pressures. The risk, however, is not straightforward to measure, as it would require forecasting (i) the policy rate; and (ii) liquidity surplus, both of which depend on the development of key macroeconomic variables, including inflation and real GDP.

27.   The CBS balance sheet is exposed to foreign interest rate changes and its impact on financial assets measured at FVTPL. The fair value of a financial asset is the sum of the present value of all future cashflows as follows:

$$Fair\ Value_t = \sum_{t=1}^{n} \frac{(Cash\ Flow)_t}{(1 + r_t)^\tau}$$

Where n denotes the number for future time periods until maturity, r is the discount rate.

In the case of a zero-coupon bond, then the fair value is simply the present value of the lump sum received at maturity, as follows:

$$Fair\ Value_t = \frac{F_t}{(1 + r_t)^\tau}$$

Where F_t is the face value of the bond, r is the discount rate, and τ is the time to maturity. This is the current method used to value future cashflows from sovereign and corporate bonds in the CBS FX investment portfolio. This appears on the CBS balance sheet as financial assets measured at FVTPL.

28.   Fair valuation should account for changes in asset valuation caused by market rate movements. The current or expected rate to be used for discounting future flows may differ from the contractual/inception rate as market interest rates change. As such, increases in foreign interest rates result in a higher discount on future cash flows, which impacts income, equity, and the revaluation reserve.

Exchange Rate Risk

29.   Interest income is predominantly driven by foreign currency investments that are subject to exchange rate revaluation. Considering this, the CBS balance sheet is generally exposed to exchange rate risk. For example, USD foreign currency assets—cash deposits and FX securities held at fair value—are respectively measured on the CBS balance sheet as follows:

$$Cash_{USD,t} = \frac{FX_{USD,t}}{FX_{USD,t-1}} \cdot \left(1 + i_{cash,USD,t}\right) \cdot Cash_{USD,t-1}$$

$$Fair\ Value_{USD\ Sec,t} = \frac{FX_{USD,t}}{FX_{USD,t-1}} \cdot \left(1 + i_{YTM,USD,t}\right) \cdot \frac{F_{USD,t}}{(1 + r_t)^\tau}$$

Where $FX_{USD,t}$ is the USD/SCR exchange rate, $i_{cash,USD,t}$ is the short term (three months) foreign interest rate, $i_{YTM,USD,t}$ is the yield to maturity, and $F_{USD,t}$ is the face value of USD investments. These equations show that exchange rate appreciation against the US dollar reduces the SCR valuation of the foreign currency assets on the balance sheet. This leads to a FX revaluation loss (or a gain if the exchange rate depreciates), which, as not distributable, is not part of statutory capital but is booked in a revaluation reserve. The same convention applies for assets denominated in other currencies in the balance sheet, which as of end-2022 includes currencies such as the US dollar, euro, Canadian dollar, Chinese yuan, and British pound.

30.   Currently, the CBS manages exchange rate risks by analyzing the impact of scenario-based exchange rate changes on equity. More specifically, the CBS calculates the impact on equity from a depreciation and appreciation percentage change of the SCR against all currencies. The exchange rate risk to the equity for the latest balance sheet simulation done by the CBS was 5 percent in each direction. As such, the CBS calculates the impact on equity from a 5 percent depreciation and appreciation of the SCR against all currencies. In this TA, scenario-based exchange rate changes implied by an exchange at risk model are developed to inform the impact of exchange rate-based stress tests on equity. In addition to this, an exchange rate passthrough model developed in this TA can be used by the authorities to generally show the impact of exchange rate changes on inflation. A satellite model for the policy interest rate reaction function developed in this TA can also be used to determine the impact of inflation on the policy interest rate.

31.   The CBS is exposed to changes in the euro to US dollar exchange rate. The CBS has "borrowed" euro (government and banks' accounts at the CBS) and "invested" them in US

dollars to avoid negative interest rates in the euro area (Table 3). As a result, the CBS has a short position in euro equivalent to its total equity as of end-2023. It was, thus, exposed to an appreciation of the euro vis-à-vis the dollar. Since January 2023, the euro actually appreciated by 6.02 percent vis-à-vis the dollar; this would represent a loss equivalent to 3.1 percent of monetary liabilities on an end-2022 exposure of SCR 282.2 million.

| Table 4. Currency Composition of the Central Bank of Seychelles' Balance Sheet (millions of SCR as of December 31, 2022)				
	Assets (SCR' 000)	**Liabilities (SCR' 000)**	**Net Position**	**Percentage of Equity**
USD	7,646,524	1,229,154	6,417,371	813.40
EUR	84,591	864,081	-779,490	-101.21
CAD	204,356	0	204,356	25.90
Other Currencies	657,439	688	656,751	83.24
Source: CBS.				

B. Forecasting Balance Sheet Items

32.   The Central Bank Stress Testing (CBST) model projects a central bank's balance sheet using a combination of macroeconomic forecasts and accounting techniques consistent with IFRS 9. All balance sheet items are modeled separately, then aggregated to provide a calculation for realized income, provisioning, and, thus, statutory capital as well as revaluation income. Macroeconomic variable forecasts are sourced from the Seychelles IMF country team to ensure internal consistency. Macroeconomic variable forecasts from the country team include projections of real GDP, inflation, net foreign reserves, and the exchange rate. Other macroeconomic variables that are not forecast by the country team are instead calculated/obtained by the TA. This includes the forecast of the policy interest rate projection, which in the case of Seychelles, is predicated on an estimated Taylor rule equation. Other macroeconomic forecasts—such as foreign interest rates and CDS spreads—are sourced from external resources such as the World Economic Outlook (WEO) and Bloomberg. Several techniques are used to forecast balance sheet items, with the choice of technique depending on the types of balance sheet items.

33.   Balance sheet items can be generally classified into three categories based on variable characteristics. Balance sheet items are categorized into autonomous, endogenous, and exogenous items. Autonomous items are those determined by macroeconomic variables. These variables do not explicitly depend on other items on the balance sheet. As such, these items need to be forecast using satellite models.

- The main autonomous items on a central bank's balance sheet are currency in circulation and the reserve requirement, assuming an unchanged reserve requirement ratio.

- Endogenous items are those derived from other balance sheet items. The main endogenous item for a central bank is open market operations, which for the case of Seychelles is derived from calculating changes in currency in circulation and required reserves on the liability side and the net purchase of the USD and the investment in the government bonds on the asset side. Banks have a structural surplus with the CBS, and it is assumed that all reserves more than the reserve requirement are absorbed through CBS open market operations, i.e., the DAA, which consist of seven-day deposits with the CBS that are auctioned weekly.

- Exogenous items are policy-determined items, which may include net purchases of foreign currencies and investments in domestic government bonds. These items are not model-determined forecasts but are rather derived from policy decisions of the respective central bank.

Figure 3. The Balance Sheet Model

Source: IMF staff.
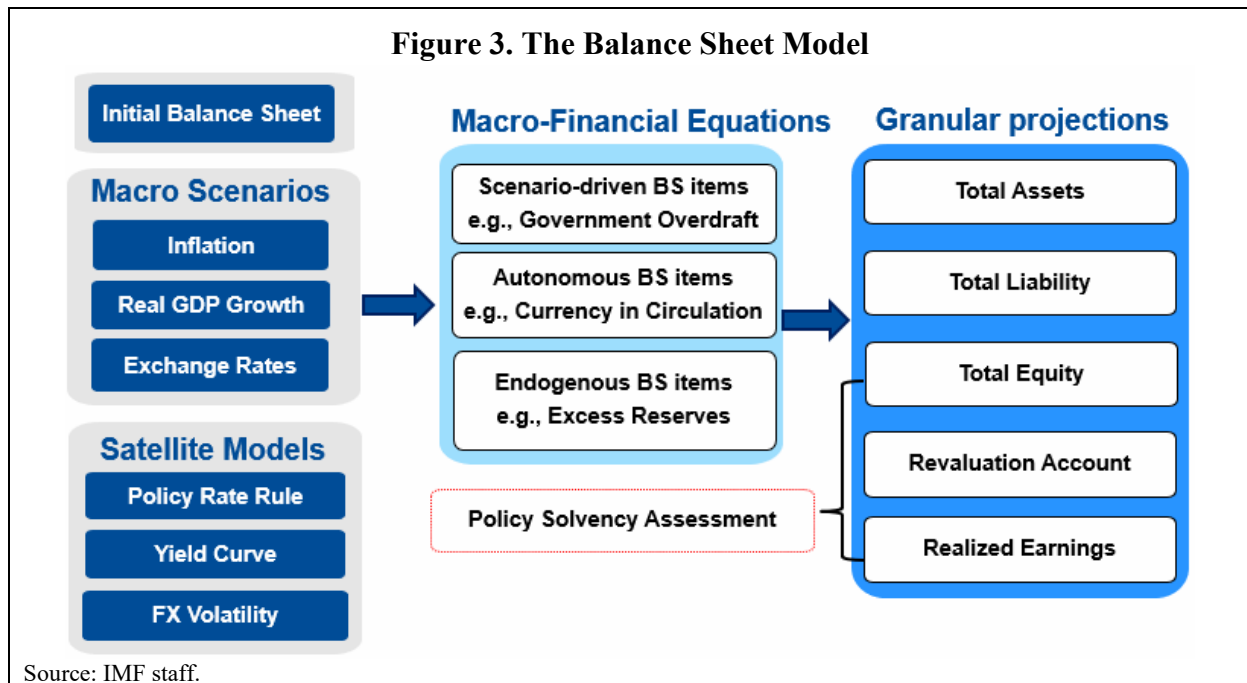
34. The CBST model has several core model equations, which are derived using standard accounting identities. Some of these include the following:

- *Equity.* The total equity can be obtained in two ways, which together provide for a consistency check.

(1) $\text{Equity}_t = \text{Total Assets}_t - \text{Total Liabilities}_t$

(2) $\text{Equity}_t = \text{Equity}_{t-1} + Realized\ earnings_t + \Delta\ Revaluation\ Account_t$

- *A clearing item.* Based on the CBS monetary policy implementation framework, DAAs are the clearing item that captures changes in the assets and liabilities that impact realized

earnings. Revaluation gains or losses are not captured, as they go directly against the revaluation account.[15] In the case of Seychelles, DAAs are used as a clearing item in the CBST model. The DAA is the main monetary policy tool to absorb excess liquidity in the system, which pays interest at the policy rate.

$$DAA_t = DAA_{t-1}[-\Delta FXInt_t - \Delta GovBond_t + \Delta CiC_t + \Delta RR_t + IRIncome_t - Op_t]$$

Where GovBond is government bond holdings, CiC_t is currency in circulation, $IRIncome_t$ is interest rate income, RR_t is required reserves, and Op_t is operational expenses.

- *Foreign reserve accumulation.* The dynamics for the gross foreign reserve accumulation (denoted by $FXRes_t$) is driven by three terms[16] namely (i) foreign currency interest income (denoted by $FIRIncome_t$); (ii) FX revaluation gain or losses (denoted by $Revaluation_t^{FXRes}$); and (iii) net USD purchase for Net Foreign Reserves (NFR) accumulation (denoted by $\Delta FXInt_t$).

$$FXRes_t = FXRes_{t-1} + FIRIncome_t + Revaluation_t^{FXRes} + \Delta FXInt_t$$

35.   The calculation of balance sheet items may differ across central banks. In the case of the CBS, it is important to show how these balance sheet items are derived. On the asset side, foreign reserves denominated in cash are term deposits valued at amortized cost. Foreign currency securities, though, are longer-term investments measured using fair valuation. Domestic loans and securities are valued at amortized cost. All domestic and foreign currency assets are subject to provisioning and ECLs. On the liabilities side, there are hardly any interest-bearing items, and the CBS currently does not remunerate required reserves.

Satellite Models

36.   Satellite models are used to forecast currency in circulation, the reserve requirement, and the domestic policy interest rate. The models are presented below.

37.   Forecasts for currency in circulation were derived using two specifications. First, a seasonal autoregressive integrated moving average (ARIMA) model with nominal GDP added as an exogenous variable was used. This exogenous variable captured both the inflation and real GDP impacts on currency in circulation. The forecast values of nominal GDP used in this equation was consistent with Seychelles' IMF program. Given the limited data points for estimation, a second specification was derived as follows:

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[15] The transfer to the government consolidated fund is captured as an increase in the deposit from the government.

[16] The equation follows Franta et al. (2022). "Exiting from an Exchange Rate Floor in a Small Open Economy: Balance Sheet Implications of the Czech National Bank's Exchange Rate Commitment."

$$CiC_t = \eta_{CiC} \, NGDP_t \cdot \left(\frac{i_0}{i_t}\right)^{\gamma_{CiC}}$$

Where, according to the results of the estimation, $\eta_{CiC} = -3.8$, $\gamma_{CiC} = 1.28$. All variables are estimated in log form, and η_{CiC} is a scaling factor, which is derived from the data. $\left(\frac{i_0}{i_t}\right)^{\gamma_{CiC}}$ captures the impact of policy rate changes to currency in circulation, with γ_{CiC} measuring the level of sensitivity.[17]

38.   Forecasts for the domestic policy interest rate were derived using an estimated Taylor rule equation. This is the current interest rate rule of the CBS following its transition to an interest rate-based approach to achieve price stability. The equation used to derive the policy interest rate is shown below. The domestic policy rate, i_t^*, is determined by the target domestic policy interest rate, $\bar{i}_t$, which is determined by inflation π_t and the long-run equilibrium interest rate, r^*, the inflation gap, $(\pi_t - \bar{\pi})$, and the output gap, $(y_t - \bar{y})$, as follows:

$$i_t = \bar{\pi} + r^* + \gamma_1 + \gamma_\pi (\pi_t - \bar{\pi}) + \gamma_y (y_t - \bar{y}) + \gamma_i i_{t-1} + \varepsilon_t$$

Where, according to the result of the estimations, $\gamma_1 = -0.01$, $\gamma_\pi = 0.076$, $\gamma_i = 0.395$, and $r^* = 0.01$. Note that the inflation target, $\bar{\pi}$, is set at the long-term average of inflation (3 percent, or 0.03, using data from 2010Q1 to 2020Q1), and potential output, $\bar{y}$, is estimated using the Hodrick-Prescott (HP) filter.[18] Note that the domestic savings rate is used as a proxy for the policy interest rate. We also included a lagged dependent variable to incorporate interest rate inertia, where it is estimated that current policy rates incorporate roughly 40 percent of past values. The output gap was not statistically significant and as a result was dropped from the equation. This Taylor rule methodology incorporates a constant long-run equilibrium real interest rate (neutral interest rate), r^*, which had to be estimated using a reduced form approach,[19] again using the domestic savings rate as a proxy for the domestic policy interest rate. The neutral rate is defined as the real interest rate, which is consistent with output at its potential level (after business cycle shocks have dissipated) and prices being stable (neither increasing nor decreasing).

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[17] Based on our estimations, η_{CiC} has been stable over a long-term horizon in the Seychelles economy. As such, this scalar value was applied in this TA. In addition, $\left(\frac{i_0}{i_t}\right)^{\gamma_{CiC}}$ was not found to be statistically significant (using market interest rates as a proxy for the policy rate) and, as such, was dropped from the equation. Based on the predicted values of the estimations, currency in circulation grows at approximately the same rate as nominal GDP growth.

[18] Potential output is measured using the hp filter with lambda set at 1600 on log real GDP. The output gap is log real GDP minus log potential GDP.

[19] See Mendes, Rhys R. (2014). "The Neutral Rate of Interest in Canada." Bank of Canada Discussion Paper/Document d'analyse. 2014-5.

39.   Using a reduced form approach, the neutral interest rate[20] for Seychelles was estimated to be 1.0 percent, or 0.01. This reduced form approach uses the proxy policy interest rate, i_t^*, growth in potential GDP, $\Delta \bar{y}$, (the first difference of the log of potential GDP), and real foreign interest rates (European Central Bank (ECB) monetary policy rate in real terms), i^*, and crisis dummy variables, d_1 and d_2, as follows.[21]

$$r_t^* = \alpha_1 + \alpha_2 r_{t-1}^* + \alpha_3 i_t^* + \alpha_4 \Delta \bar{y} + \alpha_5 d_1 + \alpha_6 d_2 + \varepsilon_t$$

Where, according to the results of the estimations, α_1= -0.001, α_2= 0.697, α_3= 0.166, α_4= 1.589, α_5= -0.22, α_6= 0.004. To calculate the constant equilibrium rate, these estimated coefficients along with the long-term average growth rate of potential output and the constant real equilibrium interest rate for the EU are used. [22]

40.   Another satellite model is used to forecast operational costs, which is a key input for the profit and loss account. Operational costs are modeled to increase log-linearly with nominal GDP,[23] as follows:

$$\text{Operational Cost}_t = \mu NGDP_t^\alpha$$

Where, according to the results of the estimations, $\ln(\mu)$= -3.95, and α = 1.59. This estimated equation is used to predict operational costs from 2023 to 2028, which serves as an input in the Central Bank Balance Sheet (CBBS) model that predicts equity. The scalar μ indicates that operational costs are much smaller than nominal GDP, less than 1.0 percent of GDP, as expected. The coefficient α is significatively above 1.0, indicating that operational costs have been growing, on average, at a slightly higher rate relative to nominal GDP over the period.

Expected Path

41.   Prior to executing scenario-based stress tests on equity, it is important to evaluate the starting point of the forecasts and the expected path for equity. This starting point is represented by the end-2022 balance sheet. All financial assets are either fair valued or sufficiently

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[20] This approach assumes that both domestic and global factors play important roles governed by an endogenous risk premium.

[21] Crisis dummy variables for 2008 and 2020 were added to ensure accuracy. The Fed Funds rate was used initially, but found to be statistically insignificant, and this led to the incorporation of the ECB monetary policy rate.

[22] The neutral interest rate was found to be approximately 1.0 percent in real terms. Note that the neutral is calculated using the estimated coefficients, and a long run concept is employed, and it translates to making $r_{t-1}^* = r_t^*$, and growth in potential output being equal to its long run average.

[23] Note that other specifications can be used. First, operational costs can be modeled as a process influenced by inflation plus margin. Second, operational costs can be modeled using a time trend where it is assumed that operational costs increase linearly with time. The nominal GDP-based approach was found to track historical operational costs more closely than these alternatives.

provisioned as of end-2022. Therefore, we can use the financial statements as published at end-2022 without further fair valuation or provisioning (Table 2).
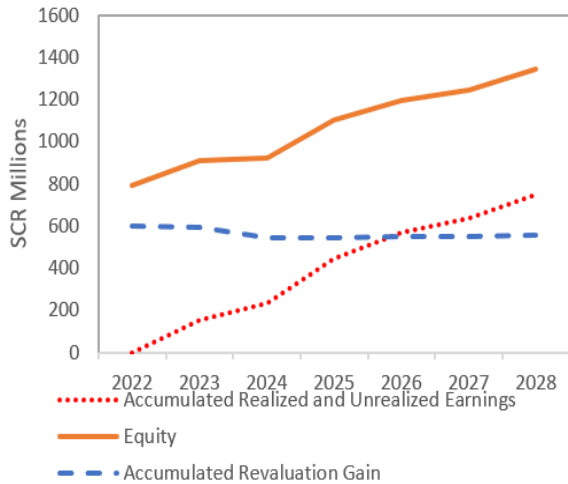
42.   Buoyed by robust tourist arrivals, the Seychelles economy is expected to grow by 4.3 percent in 2023 with an average growth of 3.8 percent from 2024 to 2028. Inflation of 2.2 percent is forecast for 2023, but this is expected to increase marginally to an average of 3.3 percent from 2024 to 2028. The USD/SCR exchange rate is expected to remain stable at 14.12 from 2023 to 2028. The forecasts for real GDP, inflation, and the exchange rate are sourced from the Seychelles country team. As it relates to the forecast for the domestic policy interest rate, the Taylor rule estimation of this TA indicates that the domestic policy interest rate will marginally decline in 2023 to 1.9 percent, reflecting the lower-than-target inflation outcome.[24] Consistent with the forecast increase in inflation in 2025, the impact on the domestic policy interest rate is a marginal increase in the rate from 2025 to 2028. This impact on the domestic policy interest rates reflects the increased inflation as well as interest rate inertia/smoothing, which was specified in the Taylor rule equation.
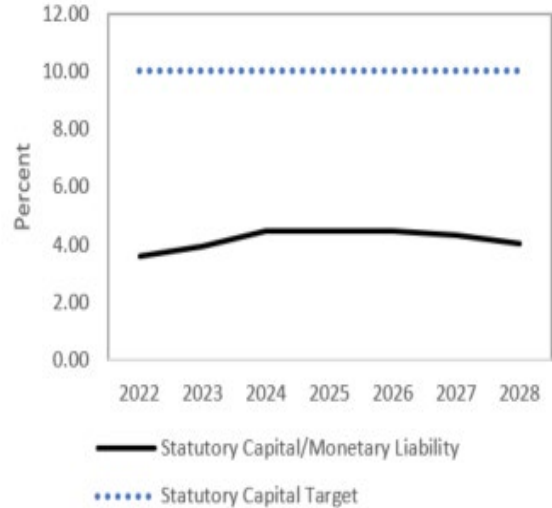
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[24] In the absence of an official target, an implicit inflation target has been determined by taking the long-term (2010Q1 to 2020Q1) average of annual inflation.
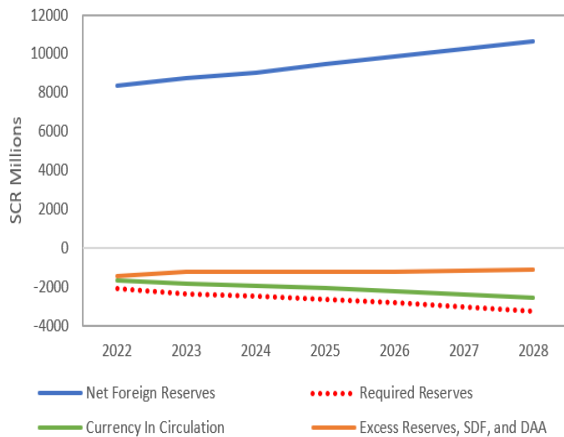
Figure 4. Expected Path Projections

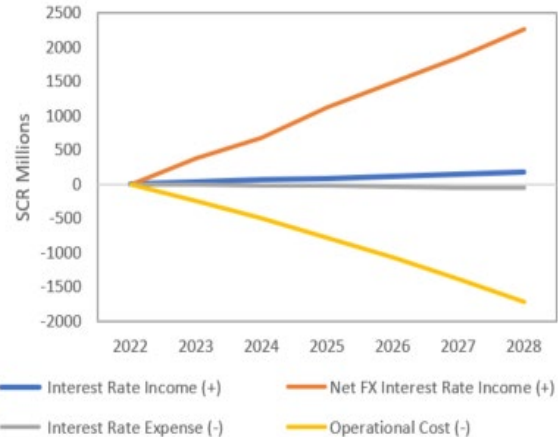**Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains**

- ·········· Accumulated Realized and Unrealized Earnings
- ——— Equity
- – – · Accumulated Revaluation Gain

Projection of Equity/GDP & Statutory Capital/Reserve Money

- ——— Statutory Capital/Monetary Liability
- ·········· Statutory Capital Target

Projection of Balance Sheet by Category

- ——— Net Foreign Reserves
- ·········· Required Reserves
- ——— Currency In Circulation
- ——— Excess Reserves, SDF, and DAA

Projection of Income & Expenses

- ——— Interest Rate Income (+)
- ——— Net FX Interest Rate Income (+)
- ——— Interest Rate Expense (-)
- ——— Operational Cost (-)

Source: IMF staff calculations.

Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement ; SDF = Standing Deposit Facility.

43.   All else being equal, a recapitalization of more than 1.0 percent of GDP would be necessary to reach the minimum statutory capital by end-2028. Higher FX reserves returns allow the CBS to cover operational expenses, while the nonremuneration of banks' liquidity surplus keeps policy cost null. Statutory capital marginally increases as a percentage of monetary liabilities but remains well below the legal 10 percent target. An upfront recapitalization in 2023 of at least SCR 390 million, or about 1.0 percent of GDP, would be necessary to reach the minimum target by the end of the forecast horizon based on retained earnings.

C. Stressing the Equity Path

Scenarios

44.   The test consists of stressing the forecast or expected equity path with "at risk" macroeconomic variables and deterministic scenarios.

- Deterministic scenarios stress the forecast by assuming that (i) the CBS absorbs all excess reserves at the policy rate via DAA issuances while keeping the reserve requirement unremunerated (policy cost scenario); (ii) the CBS absorbs all excess reserves and remunerate the reserve requirement at the policy rate (non-financial repression scenario); and (iii) operational costs are capped at the forecast inflation (efficiency scenario).

- "At-risk" consists of forecasting the distribution of inflation and real GDP growth. The 5th percentile of the worst outcome for each variable is selected to forecast all variables of the model that depend on the macroeconomic variables, including provisioning, the policy rate, currency in circulation, the reserves requirement, and operational expenses.

Deterministic Scenarios

45.   In the first deterministic scenario, we assume that all excess reserves are replaced with DAAs. The CBS target interest rate is in a mid-corridor system, which, in practical terms, entails absorbing all excess reserves. The reserve requirement remains unremunerated.

46.   The policy cost only marginally affects the equity path. The growth in currency in circulation and unremunerated reserve requirements keep the stock of DAAs low, while interest rates remain low, as inflation is expected to remain low as well. Statutory capital in 2028 is, thus, only SCR 52.7 million lower than in the expected path, and the recapitalization need in 2023 increases by only SCR 47.1 million.
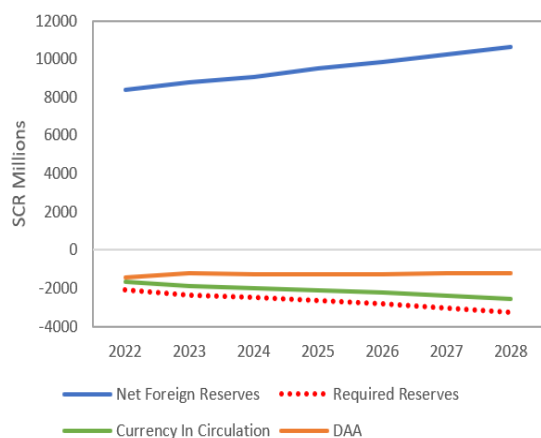
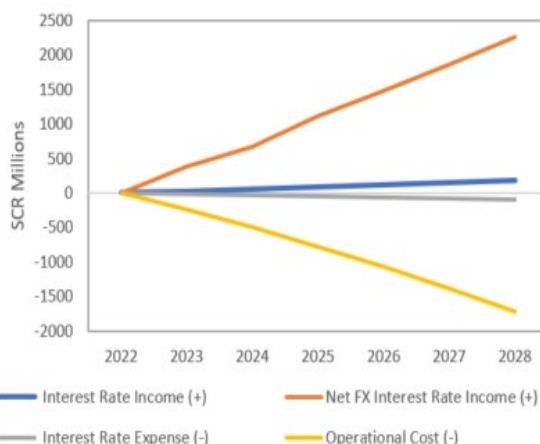**Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains**
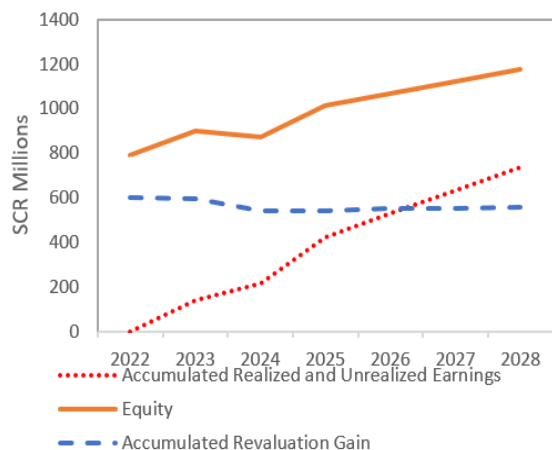
Projection of Equity/GDP & Statutory Capital/Reserve Money
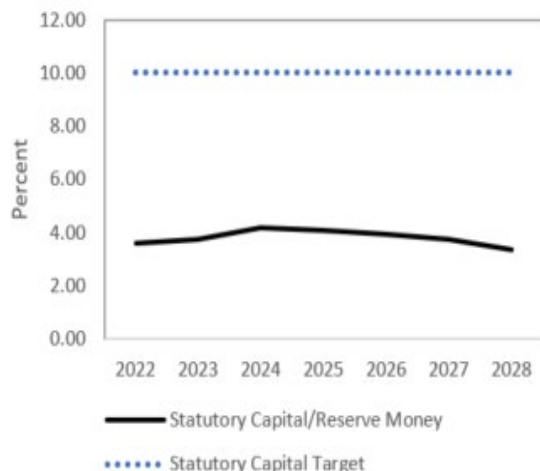
Projection of Balance Sheet, by Category

Projection of Income & Expenses

Source: IMF staff calculations.

Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement.

47.   In the second deterministic scenario, the reserve requirement is remunerated at the policy rate. The reserve requirement is 13 percent of the banks' deposit base and currently unremunerated, which represents an important cost for the banks that they pass to their customers (deposit and loan rates) and the government (government security rates).

48.   Under this "no financial repression" scenario, statutory capital declines sharply and becomes negative. The interest rate expense increases significantly, weighing on realized earnings. The stock of DAAs starts snowballing under the effect of compounded interest rates. As a result, statutory capital declines to -1.5 percent of monetary liabilities by 2028, and the

recapitalization need in 2023 increases by SCR 392.9 million relative to the expected path. As a result, the CBS needs some degree of financial repression to remain policy solvent in the absence of recapitalization.

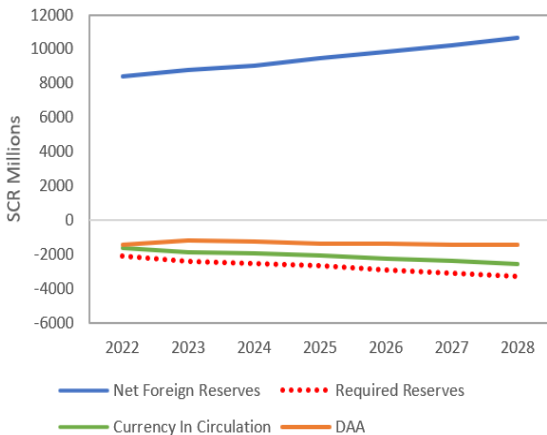**Figure 6. No Financial Repression Scenario**

Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains
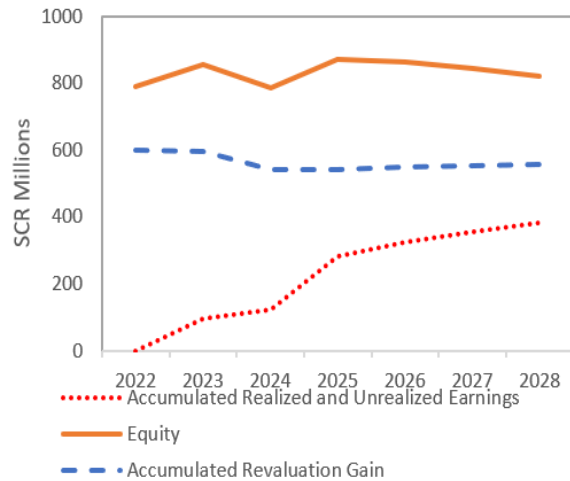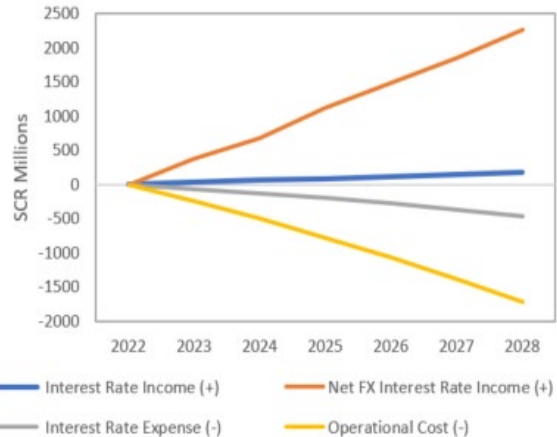
Projection of Equity/GDP & Statutory Capital/Reserve Money
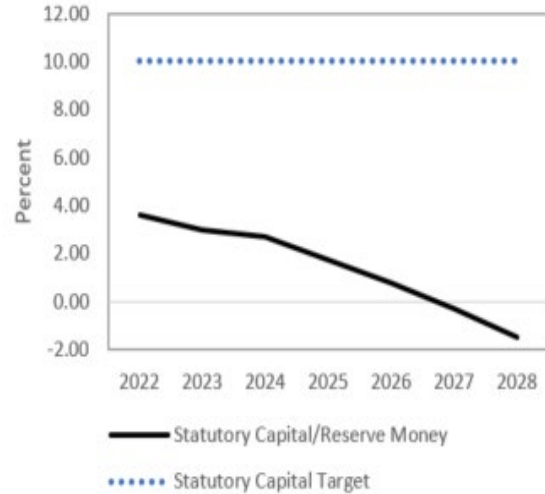
Projection of Balance Sheet, by Category

Projection of Income & Expenses

Source: IMF staff calculations.
Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement.

49.   In the third deterministic scenario, we assume that the CBS caps operational cost at the forecast inflation rate in a five-year budget. The operational cost cap is specified by conditioning future movements in operational expenses as consistent with inflation. In other words, the specification described in the satellite model for operational expenses is dropped for

this scenario and is replaced with a scenario-based specification that assumes that the operational expenses growth rate is equivalent to the inflation rate. Operational expenses are important drivers of realized net earnings in Seychelles. Since 2008, they grew consistently ahead of nominal GDP. This could be due to the many unfunded services provided by the CBS. The diseconomies of scale in a small island central bank (Section IV) also contribute to the relatively high expense. The assumption in this scenario is that the CBS reviews operational expenses and keeps them in line with inflation over the forecast horizon.

50.   Under this "efficiency" scenario, statutory capital would improve but remains short of the minimum target. With operational expenses capped at the inflation rate, statutory capital increased to 8.05 percent of monetary liabilities. Retained earnings also increased sharply to SCR 1.08 billion by 2028, allowing equity to accumulate. The recapitalization needs in 2023 would decline by SCR 266.4 million compared with the expected path, although cost recovery would likely the government pay for a fair amount of the unfunded services currently provided by the CBS.

Figure 7. Efficiency Scenario

Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains

Projection of Equity/GDP & Statutory Capital/Reserve Money

Figure 7. Efficiency Scenario (continued)

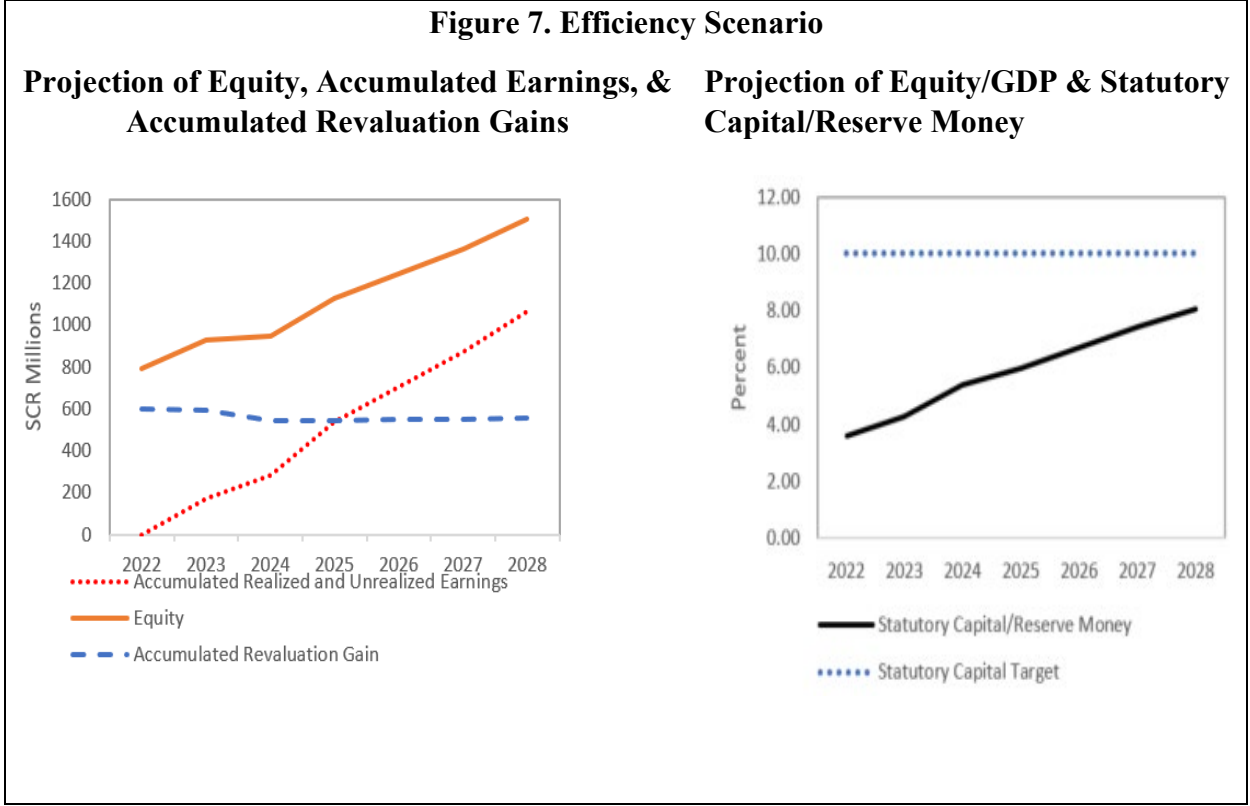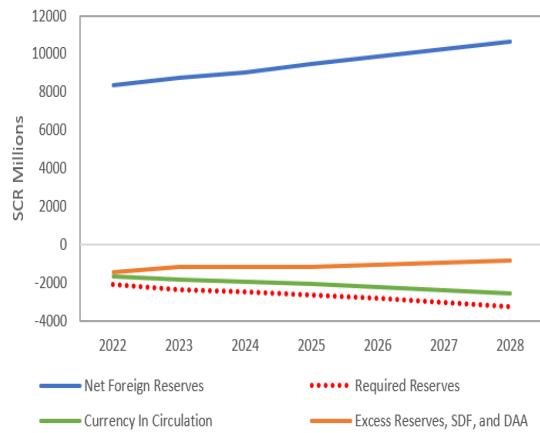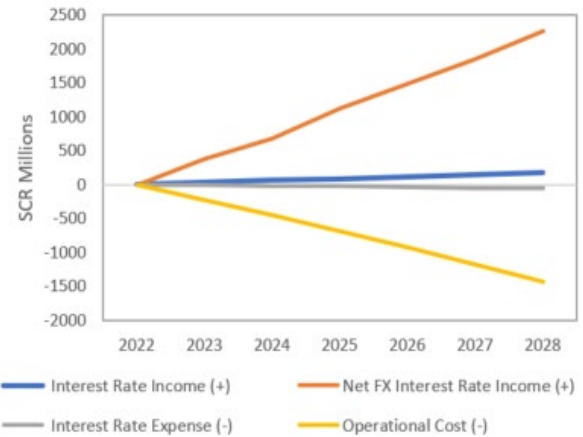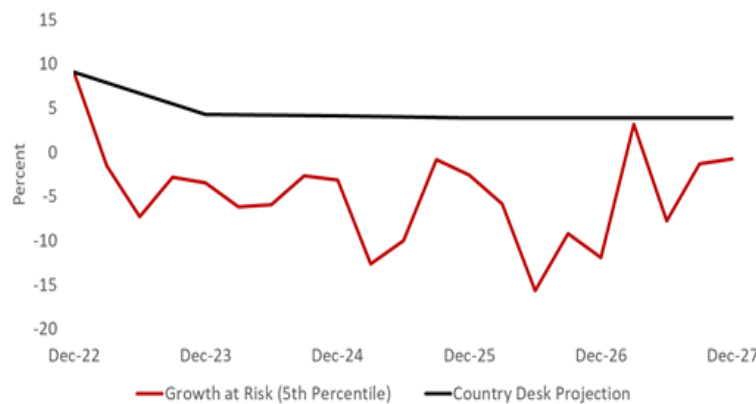**Projection of Balance Sheet, by Category**   **Projection of Income & Expenses**

Source: IMF staff calculations.

Note: income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement; SDF = Standing Deposit Facility.

At-Risk Scenarios

51.   The test consists of stressing the equity path for rare but plausible developments in the macroeconomic environment. Based on the "at-risk" model described in Appendix II, the TA projects the forecast distribution of inflation, real GDP, and the SCR/USD exchange rate and selects the 95th and the 5th percentiles of the distribution to define tail risks of an inflation and growth rate shock, respectively (Figures 8 and 9). Although the CBS remains exposed to the SCR/EUR exchange rate risk, as discussed in Section III, the exchange rate at-risk scenario will focus on the SCR/USD risk, given that this is much more material than the SCR/EUR exchange rate risk.

Figure 8. Growth at Risk Path

Sources: CBS and staff calculations.

Figure 9. Inflation at Risk Path

Source: CBS and IMF staff calculations.

Figure 10. Exchange Rate at Risk Path

Sources: CBS and IMF staff calculations.
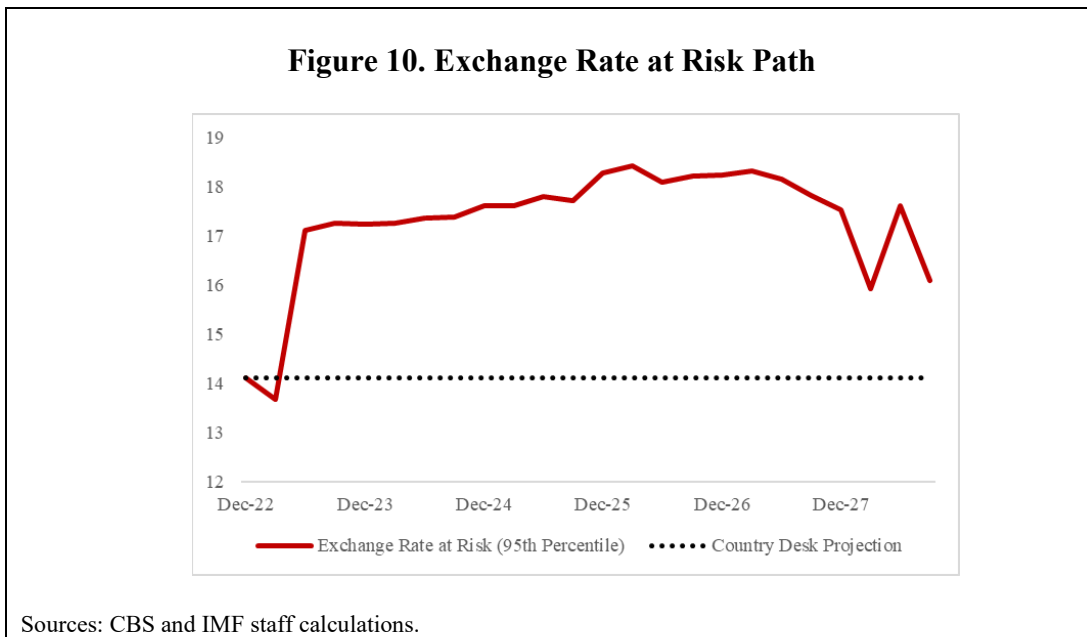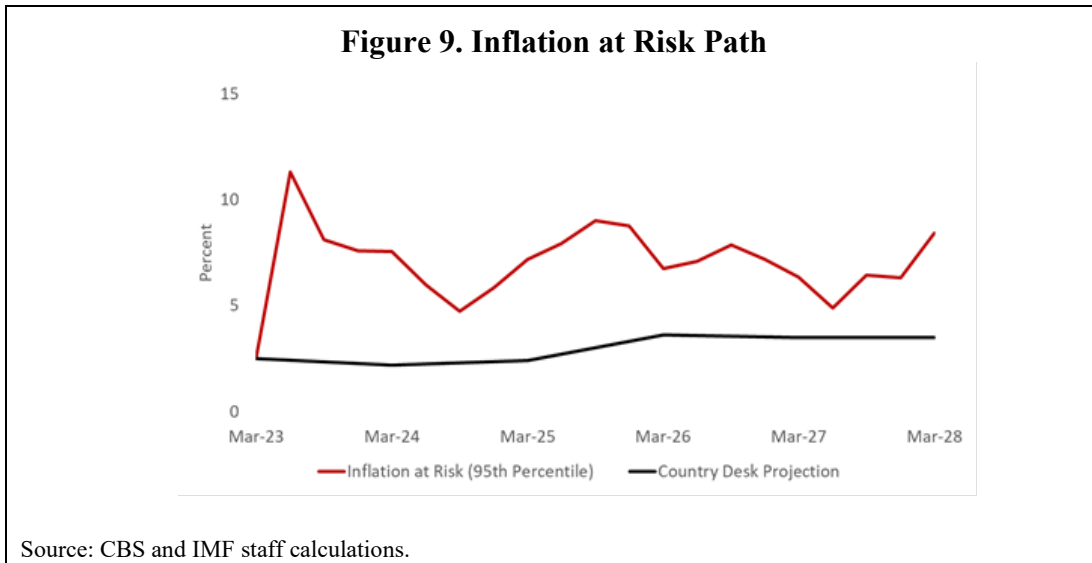
52.   An economic downturn should not significantly affect the strength of the CBS balance sheet. Statutory capital in terms of monetary liabilities improves if GDP growth is lower, because the impact on seigniorage (increase in monetary liabilities) is more than compensated by the decrease in the target (due to lower growth in monetary liabilities) and slower increase in operational expenses (which are projected based on nominal GDP growth). The stock of DAA increases compared with the expected path scenario due to the slower growth in monetary liabilities, but the impact of a larger DAA stock on interest expenses is attenuated by the lower increase in operational expenses. As a result, statutory capital in 2028 would be SCR 743.1 million, which is approximately SCR 70 million higher than the target in 2028. As such, no recapitalization is needed under this scenario.

Figure 11. Growth at Risk Scenario

Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains

Legend:
.... Accumulated Realized and Unrealized Earnings
——— Equity
– – – Accumulated Revaluation Gain

Projection of Equity/GDP & Statutory Capital/Reserve Money

Legend:
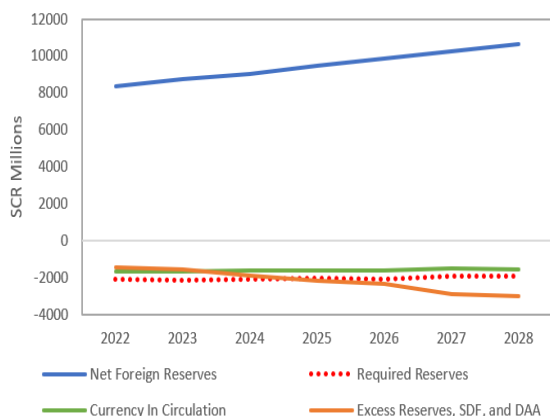——— Statutory Capital/Reserve Money
.... Statutory Capital Target

Projection of Balance Sheet, by Category

Legend:
——— Net Foreign Reserves   .... Required Reserves
——— Currency In Circulation   ——— Excess Reserves, SDF, and DAA

Projection of Income & Expenses

Legend:
——— Interest Rate Income (+)   ——— Net FX Interest Rate Income (+)
——— Interest Rate Expense (-)   ——— Operational Cost (-)
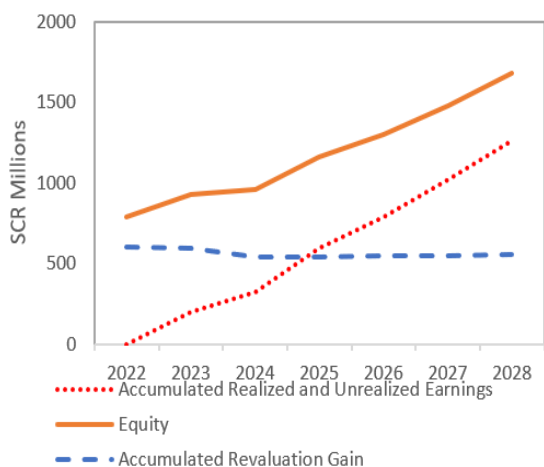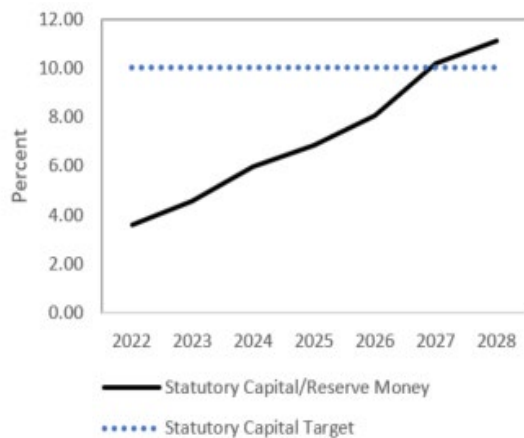
Source: IMF staff calculations.
Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement; SDF = Standing Deposit Facility.

53.   Exceptionally high inflation would weaken the CBS's financial strength. The impact of higher inflation on operational expenses and on the cost of monetary policy (via the Taylor rule) outweighs the faster growth in monetary liabilities (seigniorage) that reduces the stock of the DAA compared with the forecast scenario. As a result, statutory capital declines to 1.2 percent of monetary liabilities by 2028, and the recapitalization need in 2023 increases by SCR 213.3 million relative to the expected path.

Figure 12. Inflation at Risk Scenario

Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains

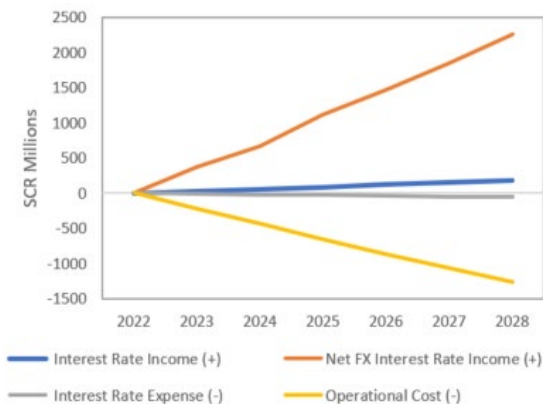- ········· Accumulated Realized and Unrealized Earnings
- ——— Equity
- – – – Accumulated Revaluation Gain

Projection of Equity/GDP & Statutory Capital/Reserve Money

- ——— Statutory Capital/Reserve Money
- ········· Statutory Capital Target

Projection of Balance Sheet, by Category

- ——— Net Foreign Reserves
- ········· Required Reserves
- ——— Currency In Circulation
- ——— Excess Reserves, SDF, and DAA

Projection of Income & Expenses

- ——— Interest Rate Income (+)
- ——— Net FX Interest Rate Income (+)
- ——— Interest Rate Expense (-)
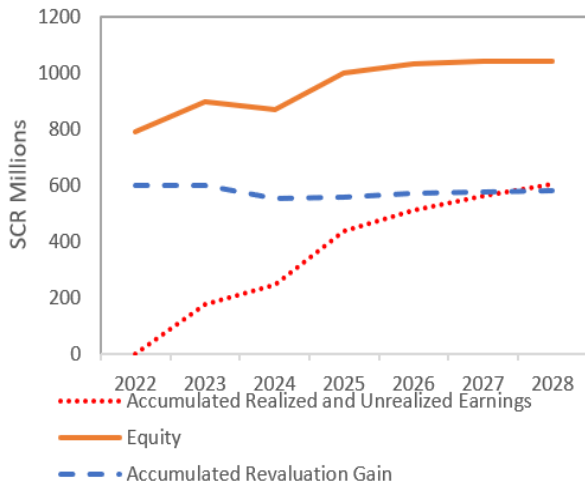- ——— Operational Cost (-)

Source: IMF staff calculations.
Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement ; SDF = Standing Deposit Facility.
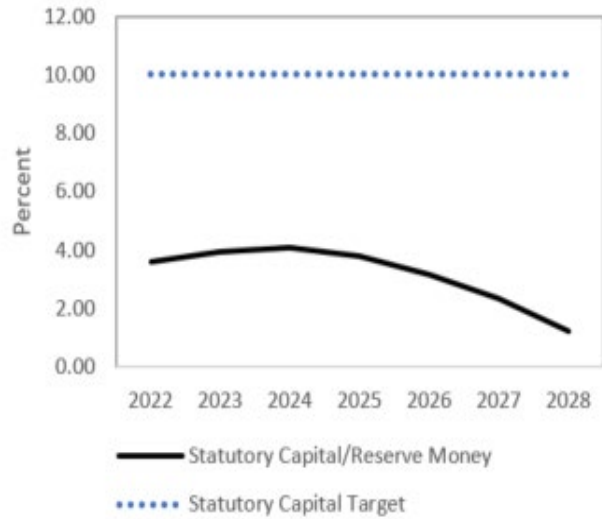
54.   **The exchange rate depreciation derived from the "exchange rate" at-risk scenario would not significantly impact statutory capital, although this would have a sizeable impact on the revaluation reserve.** The impact of this depreciation on statutory capital is transmitted through changes in inflation and interest earnings. A higher rate of depreciation increases inflation, thereby increasing operational expenses and the cost of monetary policy (via the Taylor

rule). This increase in expenses is marginally outweighed by increased interest earnings on local and foreign assets. As a result, statutory capital would slightly decline to 0.9 percent of monetary liabilities by 2028, and the recapitalization need in 2023 increases by SCR 24.8 million relative to the expected path.

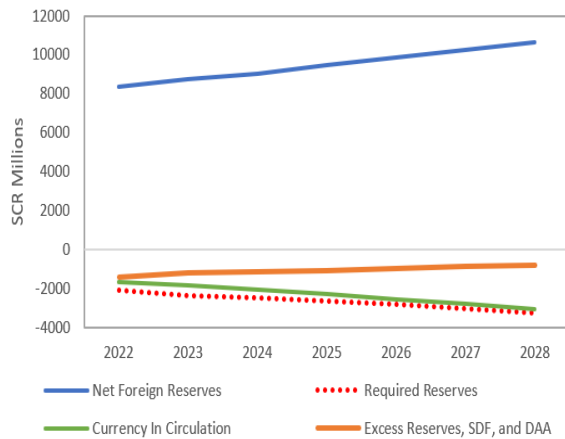**Figure 13. Exchange Rate at Risk Scenario**

Projection of Equity, Accumulated Earnings, & Accumulated Revaluation Gains
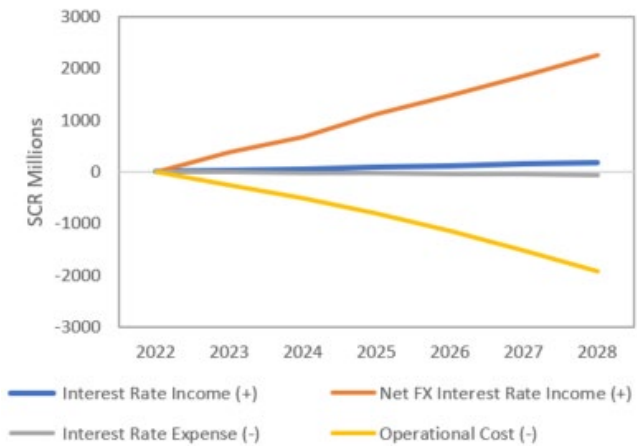
Projection of Equity/GDP & Statutory Capital/Reserve Money
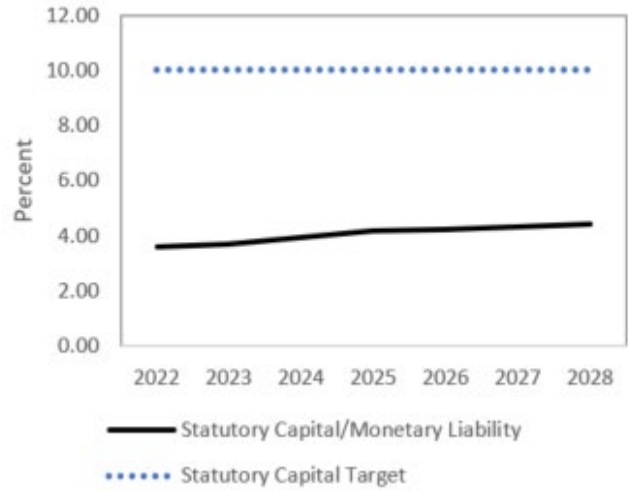
Projection of Balance Sheet, by Category
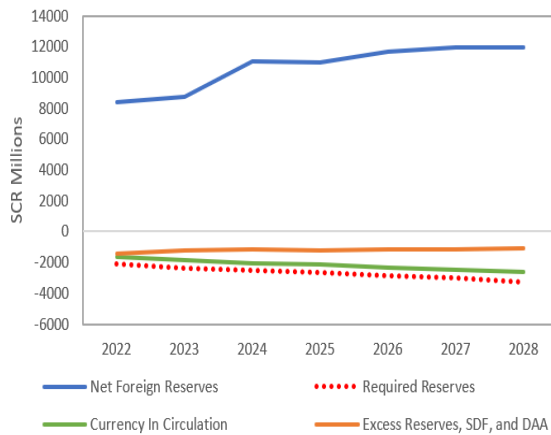
Projection of Income & Expenses
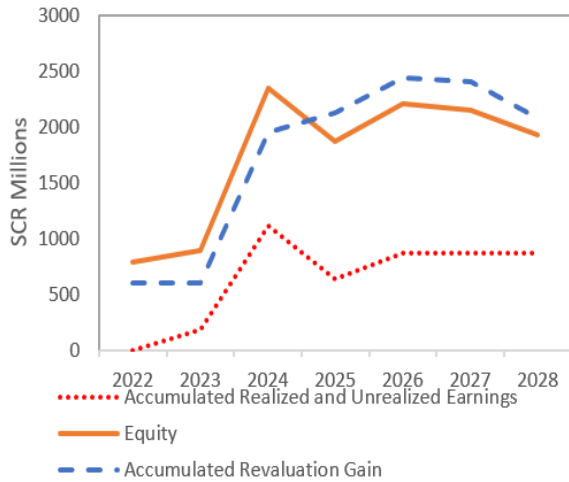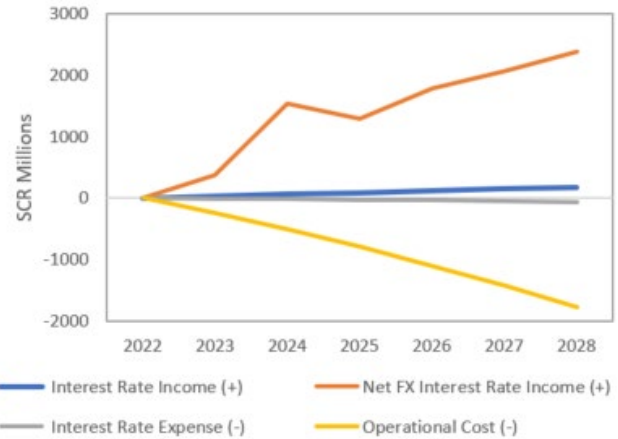

Source: IMF staff calculations.

Note: Income flows are cumulative. Balance sheet items are presented in level. DAA = Deposit Auction Arrangement ; SDF = Standing Deposit Facility.

55.   Depending on the scenarios, authorized capital should be increased between SCR 125 million and SCR 785 million, that is, between 0.4 and 2.6 percent of GDP. Prioritizing

price stability would require reducing financial repression as much as possible and, thus, increase recapitalization cost. However, efficiency gains from the CBS could help keep the final cost in a reasonable range.

Table 5. Summary Table of Recapitalization Needs		
Scenario	2023 Recapitalization Need	
	In SCR million	Percent of GDP
Expected Path	390	1.30
Deterministic—Policy Cost	437	1.48
Deterministic—No Financial Repression	785	2.66
Deterministic—Efficiency Gains	125	0.41
At-Risk—GDP	0.00	0.00
At-Risk—Inflation	603	2.05
At-Risk—Exchange Rate	365	1.24
Source: IMF Staff.		

IV.   COST EFFICIENCY INTERNATIONAL COMPARISON

56.   To achieve their policy objectives, central banks should use their resources efficiently. Central banks have a mandate (price stability) that represents a public service. Therefore, profitability is not an objective. However, central banks are expected to rationalize the cost of their operations, especially as losses may require fiscal support and may affect central bank credibility. The monetary policy cost, such as interest rate expense, is exogenous and determined by the price stability objective. In comparison, central banks can exert more control over their operational expenses, including staff and currency costs, and seek compensation from counterparties for unfunded mandates, including services to the government, banking supervision, consumer protection, and anti-money laundering and counter financing of terrorism (AML/CFT).

57.   The CBS's operational expenses to GDP are higher than comparator countries' regardless of the level of development. The mission collected information from 90 central banks' financial statements from 2008 to 2021, published online. Operational expenses of the CBS are at the tail of the distribution, meaning that they exceed most total operational expenses of comparator countries as a percentage of GDP regardless of the level of economic development. One reason is the diseconomies of scale for small central banks caused by a minimum of fixed costs that cannot be avoided. In addition, central banks in developing countries provide a broader range of services to the public, even though price and financial stability remain key mandates independently of the level of development.

Figure 14. Total Operational Expense Comparison: Expense-to-GDP
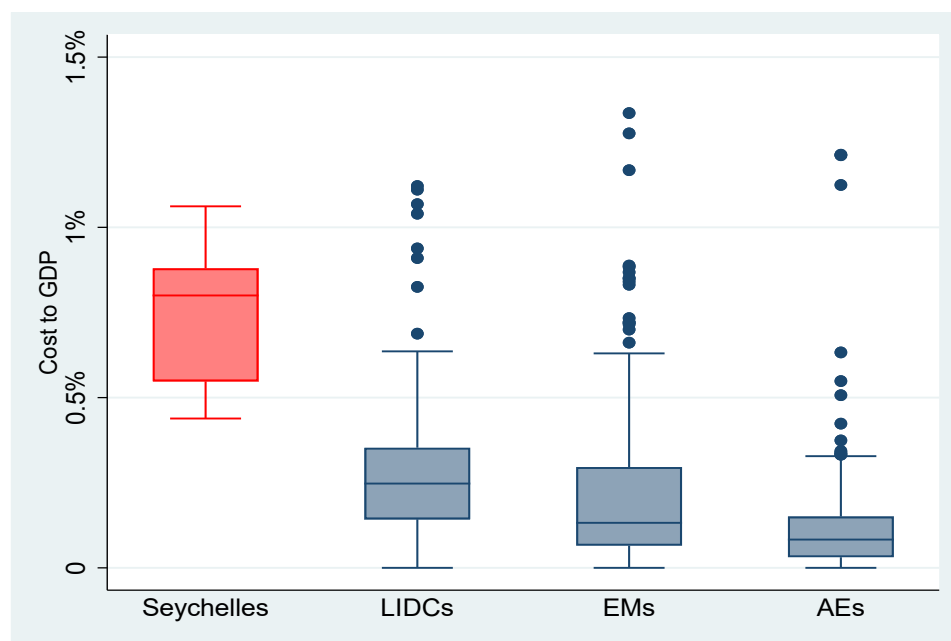
Sources: Central bank websites; IMF staff calculations.
Note: The sample ranges from 2008 to 2021. AEs = advanced economies; EMs = emerging markets; LIDCs = low-income developed countries.

58.   The mission benchmarked the CBS total operational expenses using a stochastic frontier analysis to control for more exogenous variables than GDP.[25] The stochastic frontier method consists of estimating a cost function (equation below) on the panel of 90 central banks that included staffing (indispensable for cost function estimates) in their financial statements published online from 2008 to 2021. The panel consists of 24 central banks in low-income countries, 42 in emerging economies, and 24 in advanced economies.

59.   The estimations use the logarithm of operating expenses as endogenous variables with a mix of output and input variables under a Cobb Douglas production approach.

- *Cobb-Douglas with tangible assets only.* Two output measures are included in the cost function: total assets and interest income. For input measures, we consider central banks' employees and capital. Labor cost is accounted for by real GDP per capita. We add some variables that reflect (i) the size of the country (population and country size); (ii) a

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[25] The stochastic frontier production model was first proposed independently by Aigher et al. (1977),"Formulation and Estimation of Stochastic Frontier Production Function Models," *Journal of Econometrics* and Meeusen and van den Broeck (1977), "Efficiency Estimation from Cobb-Douglas Production Functions with Composed Error," *International Economic Review* and later introduced in banking industry research in the early 1990s. A similar approach was also used by C. Chen (2009), "Bank Efficiency in Sub-Saharan African Middle-Income Countries," IMF Working Paper 09/14.

dummy variable for advanced economy central banks; and (iii) a set of time dummies, to control for unobserved time-dependent variations in costs common to all countries in the sample.

- *Cobb-Douglas with tangible and nontangible assets.* In addition to the inputs and outputs in the previous model, we include the price stability objective as an output, and we also control for the cost of monetary policy proxied by interest expenses.

$$\log(operating\ cost) = cte + \sum_{j=1}^{p} \alpha_j \log(Output)_{jit} + \sum_{j=1}^{q} \beta_j \log(Input)_{jit} + v_{it} + \varepsilon_{it}$$

60.   The cost function represents the central bank's desire to minimize its operational cost with respect to its input and output (all in logarithm terms). In the above equation, the error term has two components: a component v_{it} that represents an inefficiency term and a component that represents an idiosyncratic error. Cost efficiency can be explained as the percentage of cost that was used efficiently and is estimated as follows:

$$\text{Cost efficiency Score}_{it} = \frac{\widehat{Cost}_{frontier}}{\widehat{Cost}_{it}} = \exp\left(-\widehat{v_{it}}\right)$$

61.   The cost efficiency score is measured on a scale ranging from 0 and 1. A score of 1 indicates that the central bank has effectively used all its costs (maximum efficiency). Conversely, a score of 0 reflects complete inefficiency in the operation of a central bank.

62.   The results show that individual inefficiency can explain a large part of the variance in the production process of central banks. Table 6 presents the results of four model specifications. In each model, we estimate the share of inefficiency explained by the stochastic frontier approach. In model 4, the underlying inefficiency of a central bank can explain 81 percent of the variations of the overall inefficiency observed, while in our baseline model (model 1), it represents 72 percent. In other words, the 81 percent deviation from the frontier is due to technical inefficiency in model 4, while in model 1, it accounts for 72 percent.

Table 6. Cost Function Estimate

	Model with Tangible Assets Only		Model with Tangible and Intangible Assets	
	(1)	(2)	(3)	(4)
Log (Asset)	0.3692***	0.486***	0.4684***	0.458***
	(0.038)	(0.040)	(0.034)	(0.0346)
Log (Interest Income)	0.2187***	0.2355***	0.2515***	0.303***
	(0.039)	(0.033)	(0.0399)	(0.0344)
Log (Inflation)			0.0051	0.0101
			(0.0277)	(0.0283)
Log (# Staff)	0.319**	0.447***	0.4757***	0.495***
	(0.0624)	(0.0831)	(0.0349)	(0.0727)
Log (Equity)	0.0551***	0.0600***	0.0843***	0.076***
	(0.027)	(0.027)	(0.0285)	(0.0278)
Dummy (Inflation Targeting)				0.3535**
				(0.1457)
Log (Interest Expense)				-0.035***
				(0.0116)
Log (Population)		-0.1514***	-0.2958***	-0.261***
		(0.075)	(0.0655)	(0.060)
Log (Country Size)		0.0053	0.0740*	0.0271
		(0.0436)	(0.0375)	(0.0351)
Log (GDP per Capita)		-0.1315***		
		(0.047)		
Constant		-0.3542	0.4513	0.2230
		(0.860)	(0.6320)	(0.6152)
Observations	712	712	673	673
Time FE	yes	yes	no	No
Wald chi2	1824	2829	2829	2257
σ_μ	0.533	0.549	0.998	0.780
σ_v	0.191	0.20	0.21	0.20
Share of Inefficiency	72%	73%	83%	81%

Sources: Central bank websites; IMF staff calculations.
Note: The sample includes data published by 75 central banks from 2008 to 2021. *** = [p<0.01]; ** = [p<0.05]; * = [p<0.01].

63. **Stochastic frontier analysis points to possible efficiency gains.** In Figure 15, each red circle measures the median efficiency of a central bank, and the interquartile range captures efficiency variation over time. The central bank of Seychelles is highlighted in green. The CBS median efficiency score (0.43) is below the group median (0.55) for the whole sample but ranks above the group median (0.29) when considering only emerging and low-income countries. The finding is also stable through time, as shown by the intervals. Once it is controlling for multiple exogenous variables, the CBS is far better off in terms of efficiency scoring than the cost-to-GDP ratio without other controls.

Figure 15. Cost Efficiency Scores, by Country
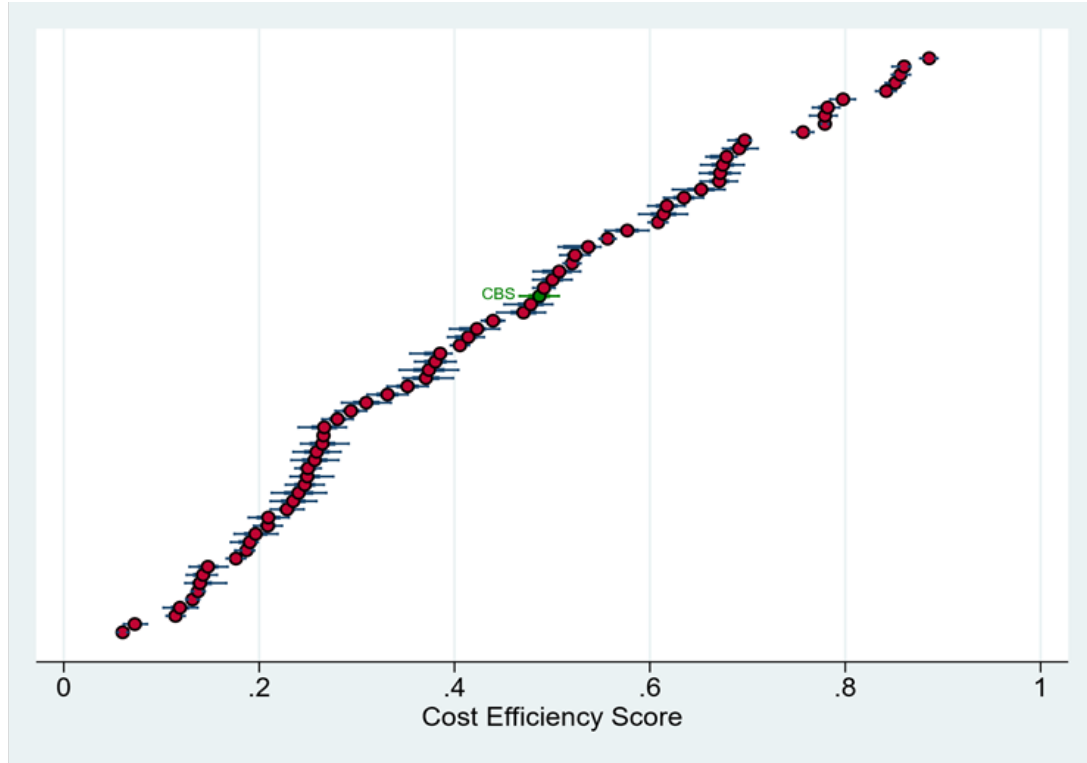
Sources: Central bank websites; IMF staff calculations.
Note: Stochastic frontier analysis with tangible and non-tangible assets.

64.   Total operational expenses of the CBS are usually broken down into four main categories in the financial statements. These include staff costs, currency expenses, professional charges,[26] and other expenses.[27] The share of staff costs remained stable as a share of total expenses, while the share of other expenses steadily increased. In contrast, currency costs and professional charges did not follow a clear trend in terms of total expenses. The following paragraphs review first staff and then currency costs.

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[26] Professional charges include fees payable to statutory auditors, consultancy fees, legal fees, and directors' fees and allowances.

[27] Other costs are for utilities, upkeep of premises and equipment, insurance, archiving, security, and others.

Figure 16. Operation Expenses Composition
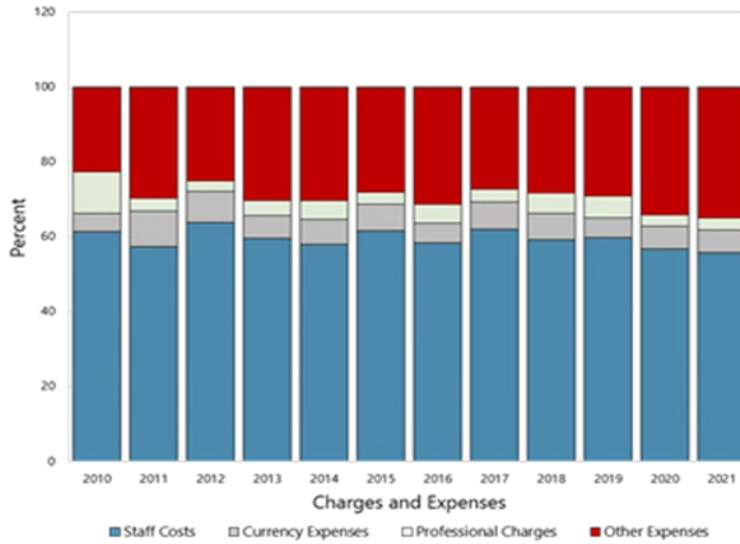
Source: CBS.

Staff Costs

65.   Average salaries are below those of comparators. Staff costs represent the highest operational expenses (56 percent in 2021), as is customary in most central banks. However, the average salary per headcount at the CBS is lower compared with peer central banks once controlled for real GDP per capita, which reflects economic development and salary level in an economy.

Figure 17. Peer Group Comparison: Average Salary per Headcount and GDP per Capita
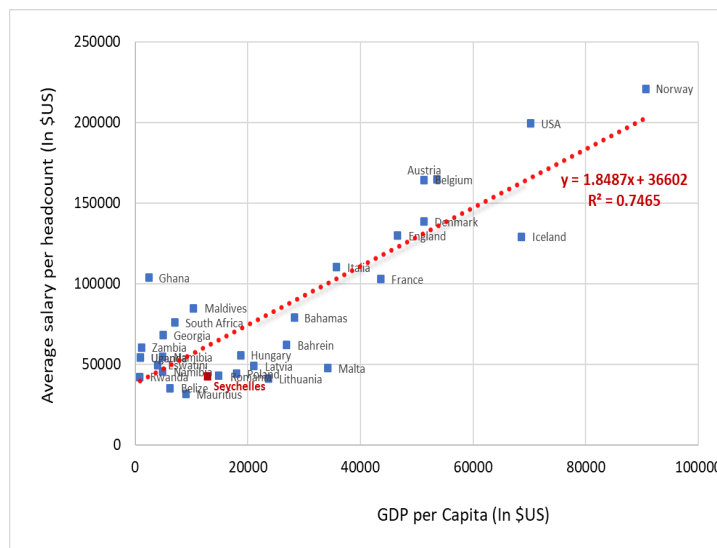
Source: CBS.

66. **Staffing is above that of comparators.** The CBS has the smallest staffing, and Seychelles is the smallest country in terms of population in the sample. However, the CBS staffing appears above what could have been expected from its population based on the average relationship between the two variables in other countries. This could be because (i) there are diseconomies of scale; and (ii) the CBS engages in more activities and has a more sophisticated policy framework than typical small economies in the sample, such as Comoros, Djibouti, or Vanuatu.

Figure 18. Staffing and Population

Source: CBS.
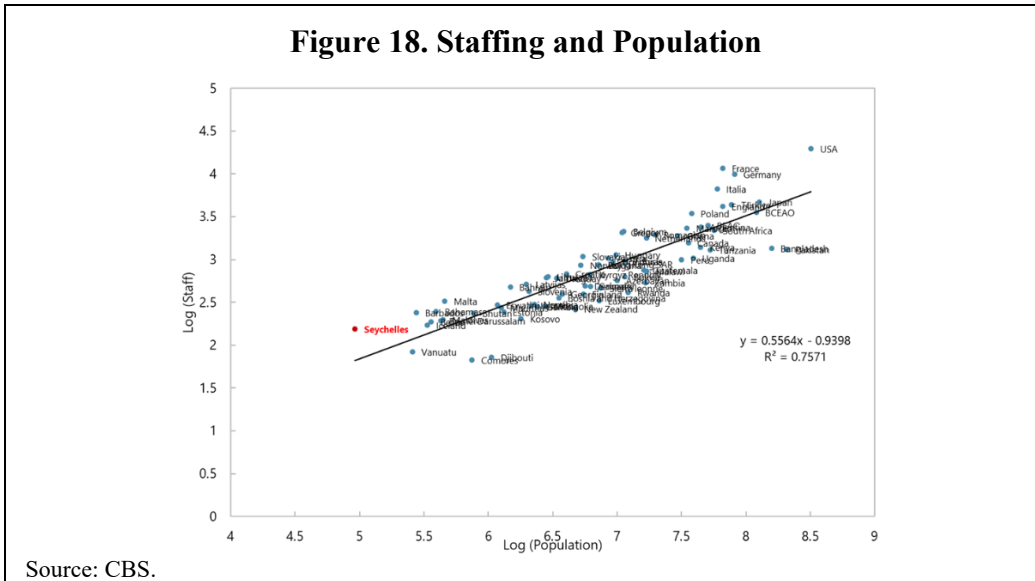
Currency Cost

67. **Currency cost is in line with international comparators.** Currency expenditures have been on a relatively downward trend and represented 6 percent of total expenditures in 2021. In terms of cost per unit of currency, Seychelles is aligned with comparators.

Figure 19. Peer Group Comparison: Currency Cost per Unit as a Percent of Currency in Circulation, 2021

Source: CBS.
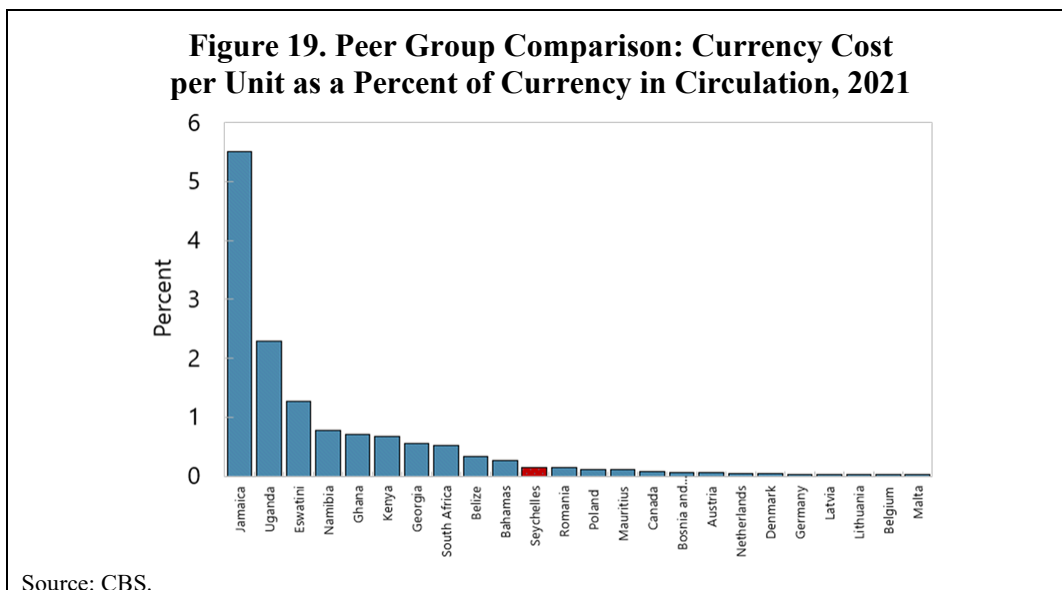
68. **The CBS should conduct an external efficiency review of its activities to identify possible savings and cost recovery options.** It is common for central banks to request a review from an independent firm or a national audit office to improve efficiency.[28] The objective is to bring efficiency more in line with the median of the comparators. The review would include all business lines and pay particular attention to noncore activities; however, it should *not* include policies. It would undertake cost benchmarking product by product. Finally, the review should identify cost recovery options for unfunded mandates, e.g., banking supervision, customer protection, AML/CFT, and service to the government (e.g., the issuance of government securities). IMF TA could assist the CBS in drafting the terms of reference.

69. **In addition, the CBS should adopt a multiyear budget to cap the growth of operational expenditures.** Budgeting over, e.g., five years, would help the CBS control operational expenses. Capping their increase to forecast inflation or nominal GDP growth would help strengthen the CBS' financial position.

V. Central Bank Losses and Recapitalization: Communications Issues

70. **The recapitalization strategy should incorporate a comprehensive communications plan targeting the public and key stakeholders.** The objective of this plan is to safeguard the CBS's credibility implementing the new framework and garnering support from relevant constituencies. The conduct of monetary policy requires that the CBS follow best practices, including during periods when its own functions temporarily erode its capital and the sustainability of its balance sheet. The latter requires appropriate communication tools and strategies to enhance transparency and accountability, maintain credibility, and preserve the bank's effectiveness. In the recent past, the operations of many central banks in the world have given rise to significant losses. In many cases, these losses were a consequence of balance sheet structures that are vulnerable to monetary policy tightening (e.g., large net holdings of government securities or FX reserves); however, negative operational results can arise from many other sources, including exogenous ones, i.e., the restructuring of government debt owned by the central bank, emerging liquidity assistance to insolvent banks, etc. Hence, an integral part of the CBS strategy to deal with its own losses and the corresponding recapitalization must be performed in the way it is revealed to the market.

A. International Experiences with Communication of Losses and Recapitalization

71. **In general, most major central banks have taken a preemptive approach to communications.** To preserve market confidence, they have undertaken proactive and transparent communication efforts when transmitting monetary policy decisions and also, when

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[28] See, for example, "Managing the Bank of England's Central Services" (2018). National Audit Office, United Kingdom.

necessary, to anticipate adverse market reactions to other developments in the economy.[29] Such a proactive policy is also appropriate when the policy solvency of the CBS could be in question (in the present or future). Transparency requires planning, coordination with other entities, and appropriate timing. At the same time, the communications strategy of central banks has evolved from being mostly focused on a professional audience to producing messages adequate for a wider—and less familiar with economic terminology—audience.[30]

B. Communications Strategy on the Recapitalization Process

72.   Clear, strategic communications to the market are needed to publish reports on material financial deterioration or central bank negative trends. Such an effort may entail simultaneous or sequential statements by the MoF and other relevant entities, and the statements will require coordinating with those institutions and preparing a communications calendar. Such statements could include policy measures by the fiscal authorities to rebuild CBS statutory capital through an upfront recapitalization from the government and/or the temporary suspension of dividend distribution to build up reserves organically. For the policy measures to be credible, the MoF's endorsement should ideally be completed by the time the relevant report is published.

73.   Messaging at every step according to a communications plan needs to be tailored to the audience by considering the appropriate technical depth and level of detail. Market participants (domestic and foreign) and specialized journalists require specific information, while the general public typically focuses on the bottom line, or impact of the announcements—both audiences deserve careful attention. Opinion makers, academics, or think tanks can be enlisted by the central bank to help explain the situation and next steps to the broader audience. Off-the-record meetings with journalists can also be helpful, as can the continuation of communications by the Governor delivered in creole, the current practice, to reach the public. Calibrating the level of engagement with each stakeholder, as well as the identification of the appropriate channels and platforms for communication, is essential for maintaining a strategic approach with impact. By understanding the specific needs and preferences of each stakeholder group, the CBS can customize its communications to send the appropriate message through the most suitable channels (traditional communications, social media, and the CBS's website), maximizing impact and effectiveness. Possible key messages are:

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[29] The importance of communications in this context is also covered in the literature (e.g., Nordstrom and Vredin (2022) and Bell et al. (2023)).

[30] A Central Bank Transparency Code Review of the CBS practices in that area was published in September 2022 (https://www.imf.org/en/Publications/CR/Issues/2022/09/27/Seychelles-Central-Bank-Transparency-Code-Review-523940). The report highlights the high standards of transparency already achieved by the CBS and makes recommendations for further improvement in the areas of governance, confidentiality, and AML/CFT.

- The causes underlying the losses and/or negative equity and how they could be connected to other economy-wide objectives, e.g., mitigating the pandemic, dealing with a potentially systemic crisis, etc.

- The key objectives of the monetary policy at present and in coming years, stating that the losses are temporary, so those policy objectives remain in place.

- The financial outcomes will not prevent the CBS from carrying out monetary policy and its ability to maintain financial stability—i.e., the CBS remains policy solvent. This is also backed by the experience of other central banks affected by similar shocks.

- The coordination between the *principal* (MoF) and the *agent* (CBS) in strengthening the CBS balance sheet, including the following:

  o The measures taken by the *principal* to recapitalize the CBS are in progress, and statutory capital is expected to reach the target level over a specific horizon. This part of the message could be buttressed by the MoF as needed.

  o The measures considered by the *agent* to rationalize costs and mitigate the risk exposure of its balance sheet, as well as to monitor risks (stress testing).

74.   The general public, and also such specialized counterparties as the fiscal authorities, typically challenges the priority of supporting the central bank balance sheet. The Q&A bulleted below reflects the typical questions/challenges and answers:

- *Q: Why should the taxpayer give money to the central bank and not the teachers and the nurses, who provide the public services needed most?*

- A: The central bank also provided a priority public service to all members of the community: stable price and the US dollars to buy imports. Those services have a financial cost that would be paid by the taxpayer, as does any other public service one way or the other. Including it explicitly in the budget is the most transparent action and avoids inflation.

- *Q: Why does the central bank not just print money? It can print as much as it wants.*

- A: Printing money is not good for price stability. Central bank money is a form of public debt, i.e., a debt of a public institution (the central bank) with the public. Printing too much creates too much public debt and would result in inflation and rationing FX.

- *Q: Recapitalization will challenge debt stability.*

- A: With recapitalization, the debt remains in the public sector: there is no rollover risk, and any profits that the central bank would eventually make would be distributed to the

government (if statutory capital is adequate). It is true that the interest payments that cover the central bank cost would represent a cost for the budget, but it is a necessary one.

75.   In the case of Seychelles, the structure of the overall message for specialized audiences could follow this outline:

i.   The Seychelles economy went through a period of severe stress in 2020-22 because of the COVID-19 pandemic. While the government and the CBS implemented a set of macroeconomic policies to mitigate the impact of the pandemic on the population, that came at a cost. At present, the CBS balance sheet reflects cumulative losses over the years directly related to revaluation of the rupee, repricing of government securities in view of monetary tightening, FX interventions, etc.

ii.   Seychelles is a small economy exposed to external shocks, requiring the CBS to maintain a relatively large stock of FX reserves, and this has a continuous carry cost. In other words, the FX reserves serve as insurance against shocks, but, as with any insurance, they bring a financial cost—the difference between the (low) return of high-quality liquid FX reserves and the local currency interest rate.

iii.   This situation is unfortunately shared, for similar reasons, with other central banks in both advanced economies and emerging markets. As in those other cases, however, a temporary equity fall does not affect the CBS's capacity to implement its policies, which aim to protect price stability and financial sector stability. Therefore, the CBS reaffirms its core mission in Seychelles while other measures are implemented to restore its capital level. That is, the CBS is policy solvent.

iv.   The central bank's core mandate to maintain price stability and provide FX in an emergency are among the most important public services that benefit all the Seychellois. The government is aware of this and is making it its priority to assume the cost they entail. On its side, the CBS is committed to delivering the services in the most cost-effective manner possible to save taxpayer resources.

v.   The financial position is expected to improve over time, bolstered by measures that, on a forward-looking basis, are expected to foster positive operational income and capital accumulation. The main elements of this plan include (i) immediate recapitalization (MoF); (ii) a revision of the dividend distribution policy (MoF and CBS); and (iii) optimization of internal efficiency (CBS). Under these active policies, it is expected that the equity of the CBS will reach the legal target of 10 percent of monetary liability by 2028.

vi.   Finally, the CBS and the MoF agreed to continue the practice of assessing the financial position of the central bank every year when preparing financial statements, to ensure

long-term policy solvency. The five-year forecast for equity will be published along with the financial statements, including some of the stress test results (e.g., in the Annual Report).

The content of this outline should be unpacked for wider audiences to ensure broader understanding of the issues and strengthen credibility of the process and the institution.

76.   The adequate in-house capacity to design and implement strategic communications efforts is key to ensuring the effectiveness and impact of the CBS's messages. Consistency and discipline in transmitting these messages across various levels, audiences, channels, and venues are crucial. Additionally, it is worth considering complementing general messages aimed at broader audiences with targeted communication or engagement with key stakeholders, such as the media and influential figures on social media. This approach can enhance the understandability and impact of the messages.

Table 7. Sample Press Release by Selected Central Banks in Relation to Losses

Institution	Key Message	Text Sample	Link
Reserve Bank of Australia	Bank is policy solvent and able to recover by retaining profits	The Reserve Bank Board's judgement is that negative equity does not affect the Bank's ability to operate effectively or perform its policy functions, but that it is important that the Bank's equity is restored over time. This restoration can be achieved through the Bank retaining its profits over the years ahead. Accordingly, the Board has communicated its strong expectation to the Australian Government that future distributable earnings would be applied, in full, to offsetting the accumulated losses and restoring the balance of the RBRF to the Board's target. In response, the Treasurer has endorsed the Board's general approach to restoring the equity position over time, while noting any retention of earnings remains at the discretion of the Treasurer in terms of the Reserve Bank Act 1959. The Treasurer also supported the Board's judgement that the Bank will be able to continue to operate effectively, even in the event of further losses over the coming few years.	https://www.rba.gov.au/publications/annual-reports/rba/2022/earnings-distribution-and-capital.html#:~:text=Reserve%20Bank%20of%20Australia%20Annual%20Report%20%E2%80%93%202022Earnings%2C%20Distribution%20and,accounting%20loss%20of%20%2436.7%20billion.
Swiss National Bank	Annual allocation to provision are sufficient	"The growth in the balance sheet in recent years has resulted in higher loss risk in absolute terms. The SNB aims for a robust balance sheet with sufficient equity capital, to ensure that it can also absorb potentially high losses such as those incurred in 2022. Equity capital is composed of the provisions for currency reserves and the distribution reserve. Annual allocations to the provisions for currency reserves are necessary to ensure a solid equity base."	https://www.snb.ch/en/mmr/reference/annrep_2022_komplett/source/annrep_2022_komplett.en.pdf
Czech National Bank	Key cause for deterioration: revaluation loss. Central bank is to recover by retaining profits	"The accumulated financial losses in the CNB's balance sheet reflect accounting revaluation losses on foreign exchange reserves in the environment of low inflation and trend nominal exchange rate appreciation." "The CNB has long explored the issue of negative central bank capital in its research publications. They lead to the conclusion that the CNB will be able to cover the accumulated losses from future profits stemming mainly from seigniorage (income on money issuance) given the expected slowdown in the trend appreciation of the currency. "	https://www.cnb.cz/en/cnb-news/press-releases/The-Czech-National-Bank-disagrees-with-the-ECB-Convergence-Report-00001
Bank of Israel	Key cause for deterioration: revaluation loss.	"The Bank's activity is not intended to maximize profits, but rather to achieve economy-wide economic goals," the Bank of Israel said."	https://en.globes.co.il/en/article-boi-lost-nis-354b-in-2021-due-to-shekel-gains-1001407775
Banco de Cenral de Chile	Negative realized earnings	In the CBC's FAQ "The equity of the Central Bank of Chile has presented negative values since 1997, since the profitability of the Bank's Assets (mainly International Reserves), has been lower than the interest payment that the Bank has made for the different Documents it has issued to sterilize the monetary effects of purchase foreign currency"	https://www.bcentral.cl/en/web/banco-central/areas/statistics/faq
Deutsche Bundesbank	Zero distributable profits in 2022 and tapping of risk provisions. Central bank able to recover by retaining future profits	The burdens will pass, and we will subsequently make profits again	https://www.bundesbank.de/en/press/press-releases/bundesbank-taps-its-risk-provisions-for-2022-905566

Sources: Reserve Bank of Australia, Swiss National Bank, Czech National Bank, Bank of Israel, Banco Central de Chile, Deustsche Bundesbank.

APPENDIX I. SATELLITE MODEL FOR EXCHANGE RATE PASS THROUGH

An inflation equation model was estimated to inform the impact on inflation from shocks to exchange rate deprecation. It was important to use a satellite model that focuses on incorporating important inflation determinants, such as the interaction of inflation and exchange rate changes, output, oil prices, and global food prices. In this context, the specification of this inflation equation model is as follows:

$$\pi_t = \alpha_0 + \alpha_1 \pi_{t-1} + \alpha_2 \Delta er_t + + \alpha_3 X_t + \varepsilon_t$$

Where π_t is the inflation rate, er_t is the SCR/USD exchange rate, X_t is a vector of control variables, inclusive of real GDP growth (denoted as Δg_t), changes in Brent oil prices (denoted as Δoil_t), and changes in the global food price index (denoted as Δfp_t). Quarterly data were used from 2007Q3 to 2022Q4.[1] The result of the estimated equation is shown in Table 1. Diagnostic tests showed that there was no serial autocorrelation in the residuals. The presence of heteroscedasticity, however, was corrected using robust standard errors.

Table1. Estimated Results of Inflation Equation

	Estimate	Standard Error	t-value	Pr(>|t|)
α_0	0.1611	(0.3347)	0.481	0.632
α_1	0.5653***	(0.0773)	7.314	0.000
Δer_t	0.1515***	(0.0197)	7.687	0.000
Δfp_{t-2}	0.1122**	(0.0470)	2.386	0.020
Δoil_{t-1}	0.0172*	(0.0099)	1.738	0.088
Adjusted R-Sq	0.669			
Durbin Watson Test Statistic = 2.47 (p-value = 0.9499)				
Breusch-Pagan Test Statistic = 14.49 (p-value = 0.013)				
Source: IMF Staff.				

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[1] For the purpose of analysis, bilateral exchange rate is used in this model.

APPENDIX II. AT-RISK PROJECTION FOR REAL GDP GROWTH, INFLATION, AND EXCHANGE RATE

1.   **The mission team uses "at-risk" models to forecast conditional distributions for real GDP growth, inflation, and the biliteral exchange rate at different horizons.** Four steps are required to obtain a full distribution of the variable of interest: (i) dimensionality reduction on explanatory variables to avoid overfitting and multicollinearity problems; (ii) conditional average prediction using the Theil-Sen model to accommodate small and "noisy" samples; (iii) skewness estimation of the distribution by the Firth model; and (iv) along with an assumption of Theil-Sen variance, the parametrization of an asymmetrical Gaussian distribution. This method was developed for an IMF FSAP mission to WAEMU[1].

2.   **The synthetic variables used in the at-risk models are obtained through data reduction based on a set of variables.** The common trend of several variables with the same "theme" (see the complete list in Tables 1, 2, and 3) are extracted through partial least squares regression.[2] The PLS estimator models the covariance between two datasets, named Y and X, based on the latent structure of the underlying data. The latent structure is obtained by projecting both the Y and X matrices on a vectorial lower-dimension subspace, such that the covariance between the projections of Y and X in this new subspace is maximized. The PLS method is useful for analyzing data with numerous multicollinear variables that are potentially noisy and may even have incomplete observations. Data reduction through PLS is particularly appropriate for aggregating numerous collinear data X, with an objective to maximize the correlation with a supervisor variable Y.

Table 1. Synthetic Regressors and Underlying Variables for Growth at Risk Model

Domestic Macro	External Demand	Domestic Financial Conditions
Real GDP growth lag	Oil index (first difference)	Capital adequacy ratio (first difference)
Domestic debt (rirst difference)	Gold index (first difference)	Nonperforming loans ratio (first difference)
Tourism earnings (first difference)	Agricultural index (first difference)	
Tuna exports (first difference)	South Africa real GDP growth	Savings rate (first difference)
	France real GDP growth	Lending rate (first difference)
	US real GDP growth	Deposit rate (first difference)
	UK real GDP growth	

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[1] Publication of "Financial Sector Assessment Program for West African Economic and Monetary Union: Technical Note on Stress Tests-Credit, Concentration, and Interest Rate Risks" (SM/22/196).

[2] Wold, S., M. Sjostrom, and L. Eriksson (2001). "PLS-Regression: A Basic Tool of Chemometrics. *Chemometrics and Intelligent Systems*, 58(2), 109-30.

India real GDP growth

Tourist arrival

*First difference and percentage change are on a year-on-year basis unless otherwise indicated.

Sources: CBS, Bloomberg, FSI, WEO, and IMF staff calculations.

Table 2. Synthetic Regressors and Underlying Variables for Inflation at Risk Model

Domestic Macro	**External Demand**	**Monetary Factor**
Real GDP growth	SCR/USD (first difference)	Saving rate (first difference)
Tourism earnings (first difference)	SCR/EUR (first difference)	Lending rate (first difference)
Tuna exports (first difference)	SCR/GBP (first difference)	Deposit rate (first difference)
	UK inflation	
	China inflation	
	EU inflation	
	South Africa inflation	
	India inflation	
	US inflation	

*First difference and percentage change are on a year-on-year basis unless otherwise indicated.

Sources: CBS, Bloomberg, FSI, WEO, and IMF staff calculations.

Table 3. Synthetic Regressors and Underlying Variables for Exchange Rate at Risk Model

| **Domestic Macro**	**Inflation and Interest Rate**	**Balance of Payment**
Real GDP growth	Inflation	Current account balance to GDP (first difference)
Tourism earnings (first difference)	Savings rate (first difference)	Export (first difference)
Tuna exports (first difference)	Lending rate (first difference)	Import (first difference)
	Deposit rate (first difference)	

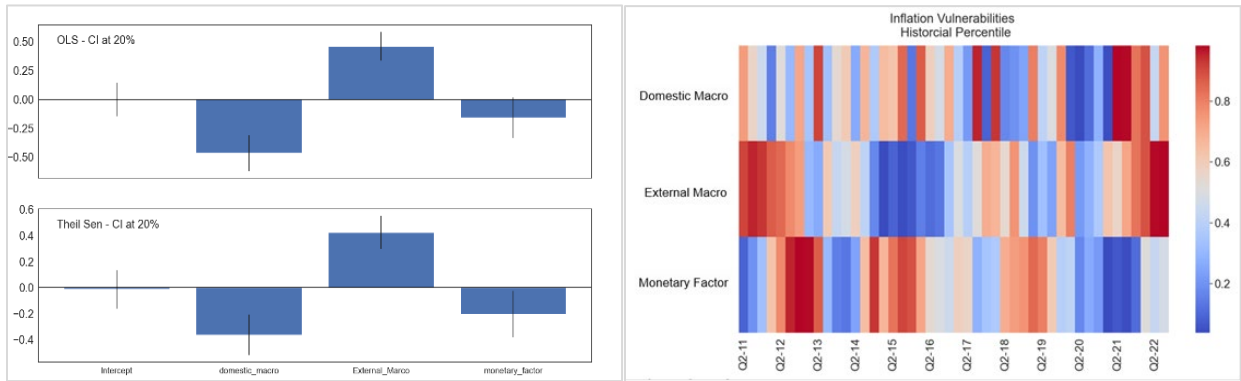*First difference and percentage change are on a year-on-year basis unless otherwise indicated.
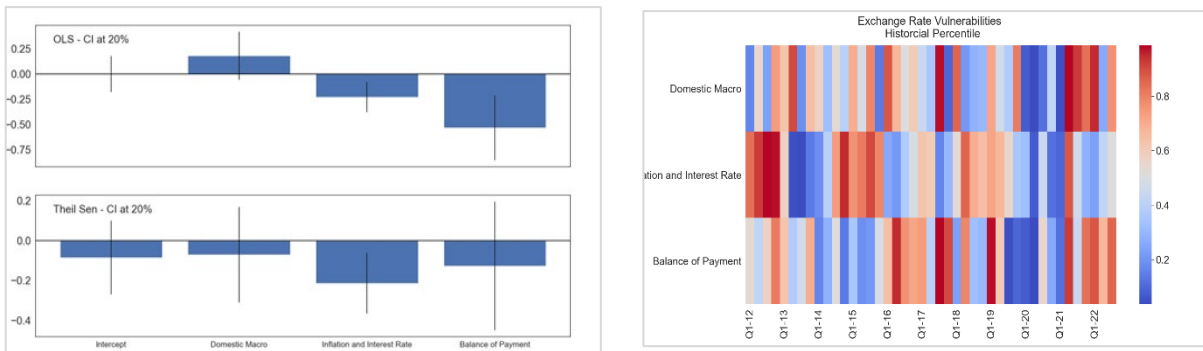Sources: CBS, Bloomberg, FSI, WEO, and IMF staff calculations.

# Figure 1. Growth at Risk
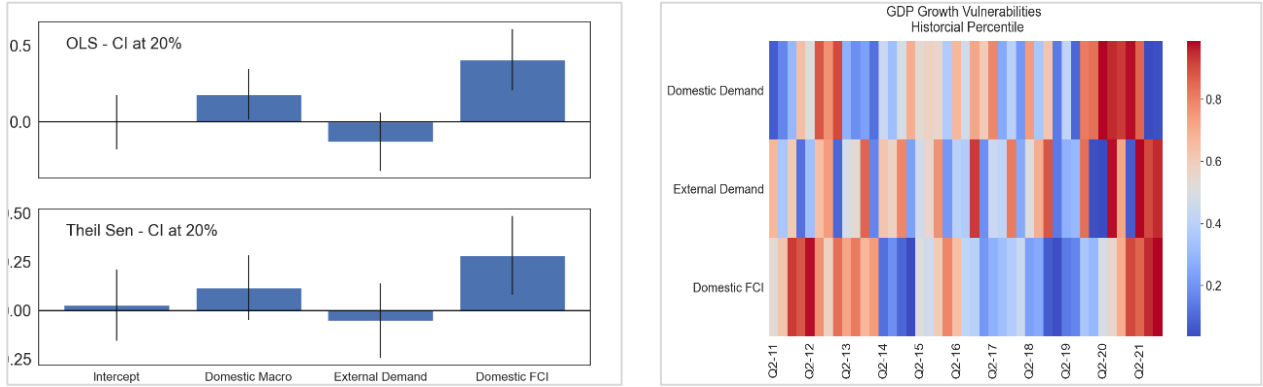
Figure 2. Inflation at Risk

Figure 3. Exchange Rate at Risk

3.   **The conditional mean is estimated using a Theil-Sen model (Theil 1950; Sen 1968), which is a regression model improving the OLS estimator to make it more accurate for estimation on small samples and, particularly, robust to outliers.** A "jackknife" Theil-Sen estimator—one that systemically removes one observation at a time from the initial sample—is constructed. For example, if the sample contains 20 observations, it creates 20 subsamples of 19 observations, with a different observation removed from the original sample at each iteration. It then estimates a classic ordinary least squares (OLS) regression on each subsample, thus obtaining 20 values for each coefficient. The Theil-Sen estimator is the average of these 20 values, i.e., the average of the OLS coefficients estimated on each of the subsamples. It is thus highly robust to outliers, to the extent that the impact of such observations is diluted in the estimators for each subsample. Taking the median makes it possible to reduce the impact of coefficients that are too extreme. The specification of the Theil-Sen model is like the one of an OLS:
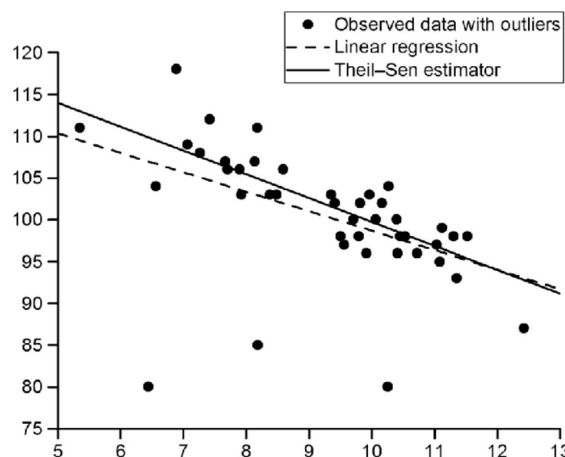
Source: Scikit-Learn documentation.

$$y_{t+h} = \alpha + \beta^{TS} X_t + \epsilon_t^{TS}$$

Where y_{t+h} is the real GDP growth in t+h, X_t a vector of conditional variables, α the intercept and ϵ_t^{TS} the residuals of the Theil-Sen regression.

4.   **The Firth model, a logistic regression model with penalized likelihood, is employed to estimate the asymmetry around the average projection of growth, inflation, or exchange rate.** Like the classical logistic model, the Firth model estimates the binary probability of an event. This probability may be coded as a binary 0/1 indicator, taking 1 if the event occurs and 0 if it does not. The event is coded as being dependent variable y_t, higher than a given value $\bar{\bar{y}}$. Thus, the specification of the Firth model is written as a classic logistic model.

$$\mathbb{P}[y_{t+h} > \bar{\bar{y}}|X_t] = \alpha + \beta^{LR} X_t + \epsilon_t^{LR}$$

Where y_{t+h} is the real GDP growth in t+h, $\bar{\bar{y}}$ a given growth threshold, X_t a vector of conditional variables, α the intercept and ϵ_t^{LR} the residuals of the logistic regression.

Firth's innovation relies on the estimation method. For small and noisy samples, or samples with a weak degree of separation (a lot of 1 and little 0, for example), the classic logistic estimator is biased. Firth shows that by modifying the likelihood function (the logistic models are estimated

based on maximum likelihood) and by introducing a penalizing term, it is possible to eliminate the estimation bias.[3]

5.   The Theil-Sen/Firth dual model thus estimates two moments in the conditional distribution of the variable of interest, and the third moment is obtained based on a parametric assumption. The first statistic is the conditional expectation estimated by the Theil-Sen model $\mathbb{E}[y_{t0+h}|X_{t0}] = \hat{\alpha} + \hat{\beta}^{TS}X_{t0}$, while the second is the asymmetry of the distribution, obtained as the cumulative density estimated at the conditional mean[4] $F(y_{t0}|X_t) = \hat{\alpha} + \hat{\beta}^{LR}X_{t0}$. These two statistics are not sufficient to parametrize a distribution, as the second order moment is missing, i.e., the variance. Estimating the conditional variance on a limited sample is discouraged, as the estimators of conditional variance need a lot of information to estimate heteroskedasticity (as in the case of an ARCH/GARCH model, for example). Thus, the at-risk model makes the simplifying but realistic assumption that the variance is unconditional and equal to the residual variance of the Theil-Sen estimation (i.e., heteroskedasticity is assumed to be constant over the course of time). This approach also addresses a recurring problem of projection models, i.e., that the variance of the projection tends to increase with the projection's horizon. With constant heteroskedasticity, there is no inflation in the variance. Thus, under this assumption, the at-risk model obtains three conditional moments: the expectation (Theil-Sen projection), the variance (constant heteroskedasticity, derived from Theil-Sen), and the skewness (obtained from the Firth logistic model).

6.   The team parametrizes an asymmetrical Gaussian distribution from the three estimated moments. The at-risk model further stabilizes the projection by using an over-parametrized fit, where the distribution is assumed to follow an asymmetric Gaussian process. This assumption is realistic, insofar as an asymmetric Gaussian distribution naturally encompasses both the standard normal distributions and the asymmetric ones. This approach retains a high degree of generality while conserving simplicity. It presents the most interesting metrics for economists (central tendency, interquartile range, and balance of risks). The choice of an asymmetrical Gaussian rather than another asymmetrical distribution is constrained by the number of moments. To estimate an asymmetric Student distribution, four moments are needed (including the kurtosis), which, due to the limited size of the sample, is unfeasible. Another approach consists of using nonparametric distributions, like kernels, but again, the limited size of the samples makes this approach unsuitable. Finally, a major advantage of the asymmetric Gaussian distribution is that it provides simple analytical relationships between moments, cumulative density, and parameters. This property greatly simplifies the distribution fit on conditional moments, as the parameters are derived manually in closed algebraic form and not through optimized approximation.

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[3] Firth, D. (1993). "Bias Reduction of Maximum Likelihood Estimates." *Biometrika*, 80(1), 27-38.

[4] This quantity is not directly a measure of asymmetry. However, in the case of an asymmetrical Gaussian distribution, it is possible to infer the asymmetry coefficient from $F(y_{t0}|X_t)$ via a simple bijective transformation.

APPENDIX III. STATUTORY CAPITAL

The reserve money/monetary liability is defined as the sum of currency in circulation, required reserves, and excess reserves (including deposit standing facility).

$$ResMoney_t = CiC_t + ResReq_t + ResEx_t$$

All calculations in this TA for statutory capital accumulation (and capital need) assume full profit retention and no transfers to (or from) the government's consolidated fund.

CBS Law

Full profit retention was assumed in this TA to calculate recapitalization needs. As such, statutory capital accumulation under the CBS Law would be much lower if the rules under the current CBS Law were assumed. Under the CBS Law, 50 percent of distributable income is transferred to the reserve funds, while the remainder is transferred to the government's consolidated fund (hereafter referred to as MoF). If the reserve funds exceed the target level of reserve funds ($ResFund_t^{max}$), then the central bank transfers total distributable income to the MoF. Note that $ResFund_t^{max}$ encapsulates both the general reserves and authorized capital, which are both capped at 6.67 and 3.33 percent of reserve money, respectively. Losses are absorbed by the general reserve. If such losses cause the general reserve to fall below zero, transfers from MOF are required to carry the general reserve back to zero, as follows:

$$ResFund_{max,t} = \eta_{ResFund} \cdot ResMoney_t$$

$$Transfer_{MOF,t} = Realized\ earnings_t - (ResFund_t^{max} - ResFund_{t-1})$$

$$GovDepo_t = GovDepo_{t-1} + Transfer_{MOF,t}$$

$$Realised\ Income_t = Total\ Income_t - Operation\ cost_t - Transfer_{MOF,t}$$

The first term on the righthand side is realized earnings, and the second term is allocating the realized earnings to the reserve fund for maintaining the target level of the reserve funds $ResFund_t^{max}$. The transfer to the MoF is captured as the increase in the government deposit.

APPENDIX IV. TAYLOR RULE ESTIMATION

Forecasts for the domestic policy interest rate were derived using an estimated Taylor rule equation. This is the current interest rate rule of the CBS following its transition to an interest rate-based approach to achieve price stability. The domestic policy rate, i_t^*, is determined by the target domestic policy interest rate, i_t which is determined by inflation π_t and the long run equilibrium interest rate, r^*, the inflation gap, $(\pi_t - \bar{\pi})$, and the output gap, $(y_t - \bar{y})$, as follows:

$$i_t = \bar{\pi} + r^* + \gamma_1 + \gamma_\pi (\pi_t - \bar{\pi}) + \gamma_y (y_t - \bar{y}) + \gamma_i i_{t-1} + \varepsilon_t$$

Where the inflation target, $\bar{\pi}$, is set at the long-term average of inflation (3 percent using data from 2010Q1 to 2020Q1) and potential output, $\bar{y}$, is estimated.[1] Note that the domestic savings rate is used as a proxy for the policy interest rate. We also included an intercept, γ_1, and a lagged dependent variable to incorporate interest rate inertia. This Taylor rule methodology also incorporated the constant long run equilibrium real interest rate (neutral interest rate), which had to be estimated using a reduced form approach, again using the domestic savings rate as a proxy for the domestic policy interest rate. We apply this reduced form approach[2] to estimate the neutral interest rate for Seychelles. As such, the reduced form approach uses the proxy policy interest rate, i_t^*, growth in potential GDP, $\Delta \bar{y}$, (the first difference of the log of potential GDP), and real foreign interest rates (ECB monetary policy rate in real terms), i^*, as follows:[3]

$$r_t^* = \alpha_1 + \alpha_2 r_{t-1}^* + \alpha_3 i_t^* + \alpha_4 \Delta \bar{y} + \alpha_5 d_1 + \alpha_6 d_2 + \varepsilon_t$$

Where, according to the results of the estimations, α_1= -0.001, α_2= 0.697, α_3= 0.166, α_4= 1.589, α_5= -0.22, and α_6= 0.004.

The neutral interest rate in real terms was found to be approximately 1.0 percent. Note that the neutral rate is calculated using the estimated coefficients, along with applying a long run concept, which translates to making $r_{t-1}^* = r_t^*$, growth in potential output set to its long run average and the ECB monetary policy rate is set to its neutral rate, which, according to the literature[4] is roughly 0 percent. The estimated neutral rate of approximately one percent is

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[1] Potential output is measured using the HP filter with lambda set at 1600.

[2] This approach assumes that both domestic and global factors play important roles governed by an endogenous risk premium.

[3] The estimated equation is derived from three identities/conditions—the balance of payments identity, the NFS accumulation equation, and the linear approximation to the interest parity condition. Crisis dummy variables for 2008 and 2020 were also added to the estimation.

[4] See IMF (2023) and Platzer et al. (2023). The references are as follows: (i) IMF (2023). Chapter 2 in World Economic Outlook: A Rocky Recovery. April; and (ii) Francesco Grigoli, Josef Platzer, and Robin Tietz (2023). "Low for (Very) Long? A Long-Run Perspective on r* across Advanced Economies. IMF Working Paper 23/85. April.

consistent with the estimation results found in the literature.[5] The Taylor rule was therefore estimated with this input; Table 1 presents the results. The output gap was not found to be statistically significant, so this was dropped from the equation and the model reestimated.[6] Based on the estimated coefficients, the predicted values of the policy interest rate are shown in Table 2. Based on the calculations, lower policy rates are predicted. This is primarily driven by forecast inflation being lower than the current implicit inflation target of 3.0 percent.

Table 1. Estimated Results of Taylor Rule Equation

	Estimate	Robust Standard Errors	t-value	Pr(>|t|)
γ_1	-0.010**	0.004	-2.155	0.035
i_{t-1}	0.395*	0.218	1.407	0.104
$(\pi_t - \bar{\pi})$	0.076*	0.043	1.742	0.087
Adjusted R-Sq	0.78			
Durbin Watson Test Statistic = 1.51 (p-value = 0.02).				
Breusch-Pagan Test Statistic = 27.47 (p-value = 1.11e-06). Robust S.E. applied for heteroscedasticity.				

Table 2. Predicted Domestic Policy Interest Rate

Year	Policy Rate
2022	2.00 (Actual)
2023	1.95
2024	2.14
2025	2.31
2026	2.37
2027	2.39
2028	2.40

[5] The Fed Funds rate was dropped from the equation because it was both statistically insignificant and also had the incorrect sign. This may be a result of the Fed Funds rate's not being an anchor historically to monetary policy interest rates in the Seychelles. Nonetheless, our result is consistent with economic literature. See Francesco Grigoli, Josef Platzer, and Robin Tietz (2023). "Low for (Very) Long? A Long-Run Perspective on r* across Advanced Economies." IMF Working Paper 23/85. April.

[6] This suggests that the central bank does not respond to output or that its response to output has been neutral historically.

APPENDIX V. PROPOSED AMENDMENTS TO CAPITAL RESERVES AND PROFIT PROVISIONS

Article	Current Provisions in the CBS Act	Proposed Amendments
14 (1)	The initial authorised capital of the Bank shall be R1,000,000 and shall accumulate as per the distributions in section 16.	The authorised capital of the Bank shall be an amount equivalent to SCR 550 million.
14 (2)	The authorised capital of the Bank shall be 3.33 per cent of monetary liabilities.	Delete
14 (3)	All capital stock of the Bank as and when issued shall be for the sole account of the Government and shall not be transferable or subject to encumbrance.	Retain
		The authorised capital of the Bank may be increased by such amounts as may be proposed by the Bank and approved by the Government. It should be reviewed at least every 10 years. No reduction of the authorized capital shall be permitted at any time.
14 (4)	For the purposes of this Act, all 'authorised capital' shall be deemed to be fully paid up.	Retain
15 (1)	The Bank shall establish and maintain a General Reserve to which such part of the distributable earnings referred to under section 16 shall be allocated at the end of each financial year.	The Bank shall establish and maintain a General Reserve to which distributable earnings referred to under section 16 shall be allocated at the end of each financial year. The General Reserve and authorized capital together shall form the statutory capital of the Bank.
15 (2)	The General Reserve referred to under subsection (1) shall not accumulate a balance of less than zero.	Retain
		The Bank shall establish a revaluation reserve to account for unrealized gains and losses [owing to its positions with foreign currencies, gold, financial instruments, and other assets].
15 (3)	Where the General Reserve accumulates a balance of less than zero, the Government shall within 30 days of publication of the annual accounts, recapitalise by transferring marketable securities to the ownership of the Bank to restore the General Reserve to zero.	Where according to the latest audited annual financial statements of the Bank, the General Reserve accumulates a balance of less than zero:
		The Bank shall, within a period of no more than 30 calendar days of publication of the annual accounts, assess the situation and prepare a report on the causes and extent of the shortfall;
		in the event that the Board approves the above-mentioned report, the Bank shall request the Government for a capital contribution to remedy the deficit with a view to restoring the General Reserve to at least zero; and

		upon receipt of this request the Government shall, within a period of no more than [90] calendar days, transfer to the Bank the necessary amount in currency or in negotiable debt instruments with a specified maturity issued at prevailing market-related interest rates.
15 (4)	The National Assembly, after a recapitalisation under subsection (3), may request a report from the Board and external auditors detailing the cause for the General Reserve accumulating a balance less than zero.	Retain
15 (5)	The report requested under subsection (4) shall be tabled before the National Assembly within 4 weeks of recapitalization.	Retain
16 (1)	A distribution from the Bank shall be based on distributable earnings that are calculated:	Retain
16 (1)(a)	as the net profit, less an amount equal to the total amount of unrealised gains, included in the net profit; and	Retain
16 (1)(b)	by adding to the amount remaining after applying paragraph (a), the total amount of unrealised gains, if those unrealised gains, included in the net profit of a previous year, are realised; and	Retain
16 (1)(c)	by the retention of the unrealised revaluation losses to the extent that they exceed any balance in the relevant Revaluation Reserve; and	Retain
16 (2)	Where the Bank has distributable earnings for any financial year, 50 per cent of those earnings shall be distributed in the following priority to the statutory capital until:	Where the Bank has distributable earnings for any financial year, 100 per cent of those earnings shall be distributed to the General Reserve until statutory capital reaches 10 percent of monetary liabilities.
16 (2)(a)	Authorized capital reaches 3.33 per cent of monetary liabilities; and	Delete
16 (2)(a)	the General Reserve reaches 6.67 per cent of monetary liabilities.	Delete
	Provided that any residual distributable earnings remaining after a distribution in paragraphs (a) and (b) shall be transferred to the Consolidated Fund	Provided that any residual distributable earnings remaining after a distribution in paragraph 16 (2) shall be transferred to the Consolidated Fund
16 (3)	Where the distributable earnings of the Bank is less than zero, they shall be offset against the General Reserve.	Retain