FINANCIAL STABILITY REPORT 2023

CONTENTS

ABBREVIATIONS AND ACRONYMS

ABM	Automated Banking Machine
ACH	Automated Clearing House
AFSI	Aggregate Financial Stability Index
BAML-GFSI	Bank of America Merrill Lynch Global Financial Stress Index
BINS	Benchmark Investment Notes
BIS	Bank for International Settlement
BN	Billion
BOJ	Bank of Jamaica
BPS	Basis Points
BSA	Banking Services Act
CAR	Capital Adequacy Ratio
CD	Certificate of Deposit
CGS	Cambium Global Solutions
CIS	Collective Investment Schemes
CISS	Composite Indicator of Systemic Stress
CPI	Consumer Price Index
CRE	Credit Risk Exposure
CRFRs	Climate Related Financial Risks
CSD	Central Securities Depository
CY	Calendar Year
DIF	Deposit Insurance Fund
DIS	Deposit Insurance System/Scheme
DTI	Deposit-taking Institution
DVBP	Dollar Value of a Basis Point
ERPS	Electronic Retail Payment Services
FITS	Financial Inclusion Technical Secretariat
FRB	Federal Reserve Board
FSB	Financial Stability Board
FSC	Financial Services Commission
FSI	Financial Soundness Index
FSR	Financial Stability Ratio
FSSC	Financial System Stability Committee
FSSN	Financial System Safety Net
FX	Foreign Exchange
FUM	Funds Under Management
GDP	Gross Domestic Product
GI	General Insurance
GOJ	Government of Jamaica
GOJGB	Government of Jamaica Global Bonds
GWP	Gross Written Premium
HHI	Herfindahl-Hirschman Index
HQLA	High Quality Liquid Assets
IADI	International Association of Deposit Insurers
ICs	Insurance Companies
IoC	Index of Contagion
IOSCO	International organization of securities commissions
JDIC	Jamaica Deposit Insurance Corporation
JDX	Jamaica Debt Exchange

LCR	Liquidity Coverage Ratio
LI	Life Insurance
LICAT	Life Insurance Capital Adequacy Test
MaFI	Macro-Financial Index
MCCSR	Minimum Continuing Capital and Surplus Requirements
MCT	Minimum Capital Test
MiPI	Micro-Prudential Index
NDTFI	Non-Deposit-taking Financial Institution
NDX	National Debt Exchange
NFCs	Non-financial Corporates
NIR	Net International Reserves
NOP	Net Open Position
NPL	Non-Performing Loan
POS	Point-of-Sale
REER	Real Effective Exchange Rate
ROA	Return on Asset
ROE	Return of Equity
RTGS	Real-Time Gross Settlement System
RWA	Risk-Weighted Assets
SD	Securities Dealer
SIFI	Systemically Important Financial Institution
SRR	Special Resolution Regime
SRS	Systemic Risk Score
SyRB	Systemic Risk Buffer
TCFD	Task Force on Climate-Related Financial Disclosures
VIX	Volatility Index
WECI	World Economic Climate Index
WTI	West Texas Intermediate

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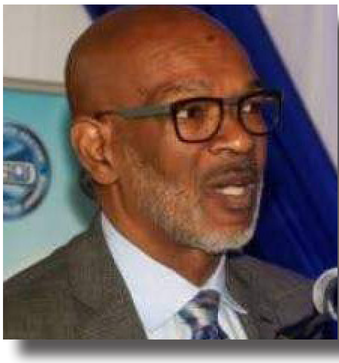


David Marston
Appointed Member

FINANCIAL STABILITY OVERVIEW

Within the context of inflation generally remaining above the Bank's target range of 4.0 per cent to 6.0 per cent, Bank of Jamaica maintained its tight monetary policy stance during 2023. The Bank's liquidity management strategy during the year also incorporated increases in the domestic and the foreign currency cash reserve requirements and the removal of the absolute limits on the foreign currency net open positions.

Driven by the effects of Bank of Jamaica's monetary policy actions and falling international commodity prices, inflation moderated to 6.9 per cent at end-2023 from 9.4 per cent at end-2022. The exchange rate, a principal driver of inflation and inflation expectations, remained relatively stable over the year, depreciating by 1.9 per cent. However, the equity markets continued to decline with the main JSE index falling by 8.5 per cent for the year, albeit at a slower pace relative to the prior year.

Notwithstanding the impact of tight monetary policy, the Jamaican economy is estimated to have expanded by 2.6 per cent in 2023, following strong recovery of 5.2 per cent in 2022. The expansion of the economy in 2023 was driven by expansions in the Mining & Quarrying sector and Tourism, the impact of which was partly offset by declines in construction, agriculture, forestry and fishing. Additionally, unemployment fell to a record low of 4.2 per cent and the public debt continued to fall, reaching 74.2 per cent of GDP at the end of the year.

In light of the generally favourable macroeconomic conditions, the Bank's Macro-Financial Index, which serves as an aggregate measure of financial risk, remained stable for the year and well below the crisis threshold.

There was a moderation in the growth of the global economy driven by ongoing geo-political tensions and the impact of tight monetary policy. The global economy grew by 3.1 per cent for 2023, marginally lower than the growth in the previous year. Although, global inflation remained outside of the target ranges for central banks, it declined relative to the previous year.

Deposit-taking institutions' (DTIs') assets grew more rapidly than in the previous year in a context where they maintained strong liquidity and capital positions, as well as improved their profitability. Additionally, fair value losses were significantly reduced owing to portfolio adjustments made by the entities. Proactive interventions by the regulators also supported the institutions in shoring up their capital positions within the context of the high interest rate environment.

Securities dealers (SDs) also had a positive year with their capital positions strengthened. Similarly, fair value losses declined for the year. However, profits for the ten largest securities dealers declined relative to the previous year. The insurance sectors' asset base expanded for the year and the sector remained adequately capitalized, while its profitability improved substantially. The pension funds sector and collective investments schemes (CIS) however recorded relatively weak asset growth for the review period.

The financial system continued to manage its sectoral exposures. Credit to the household sector accelerated for the year, although the growth in mortgage loans slowed in the context of the tightening of monetary policy. Credit to the corporate sector expanded with each of the top 5 economic sectors exhibiting credit growth. For both the corporate and household sectors, loan quality as well as debt sustainability measures remained stable or improved. However, the quality of construction-related loans, which is among DTIs largest exposures, showed signs of weakness in the context of weakening demand. Regulators have increased surveillance of the exposure and have been successful in maintaining robust loan performances.

DTIs' exposure to foreign non-financial corporates (NFCs) increased noticeably between 2017 and 2023. An assessment was carried out to evaluate the risks around this exposure. These exposures were mainly in the form of loans, the majority of which were extended to Jamaican-owned companies incorporated overseas. The NPLs on these loans were generally low.

Securities dealers and insurance companies maintained relatively low exposures to equities and real estate assets. For pension funds, a trend decline in holdings of equities continued as there was ongoing pursuit of higher yielding investments amid the elevated interest rate environment.

Looking forward, BOJ has identified climate-related financial risks, cyber-risks and higher inflationary pressures, possible due to geopolitics, as the key risks facing the financial sector in the near and medium-term. The Bank's stress tests were therefore focussed on the quantification of the risks in macro economy arising from higher than projected inflation and interest rates. The results of the stress tests continued to indicate that the sectors remained broadly resilient to a range of shocks.

New Developments

The Bank continued its commitment to addressing climate-related financial risks with the aim of enhancing Jamaica's regulatory capacity to identify and manage these risks. At the close of 2023, the Bank published a set of commitments towards this end. Phase II of the climate risk project is anticipated to commence in the second quarter of 2024 and should span a period of three to four years. Additionally, as cyber risks become a more prominent feature of the modern, digitized financial system and as DTIs have reported a general increase in bank fraud, the need for industry participants to develop cyber resilience has become crucial. In this context, BOJ made significant efforts towards creating a Cyber Resilience Framework, which seek to establish guiding principles and minimum standards for cyber security. The Bank is committed to further bolstering cybersecurity measures for the sector. In this context, additional guidance and initiatives are slated to be released by the central bank in 2024.

1.0 FINANCIAL STABILITY ASSESSMENT

This chapter examines the current state of financial stability in Jamaica, the main vulnerabilities and risks to the financial system.

1.1 Overview

During 2023, risks to domestic financial system stability were moderate as reflected in the performance of macro-financial indices of financial conditions. The system was adversely affected by increases in interest rates in the context of a continued inflationary environment. The financial sector also continued to be profitable, liquid and adequately capitalized, despite the impact of the ongoing high interest rate environment on asset prices.

There is a risk that inflation could be progressively above the central bank's target in 2024, which could precipitate further monetary tightening. This could pose risks to the investment and credit portfolios of financial institutions.

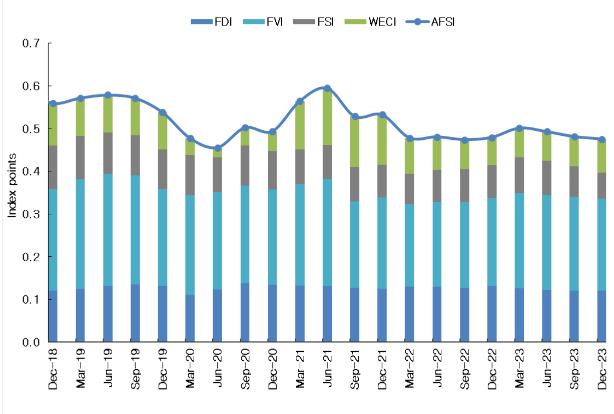
Deposit-taking institutions and securities dealers were subjected to stress tests under adverse scenarios. The results of the BOJ's stress tests showed that the financial sector remained resilient to these macro-financial shocks.[1]

Other key emerging risks and vulnerabilities to the stability of the Jamaican financial system include climate-related financial risks, cyber security threats, escalation of geopolitical tensions and interconnectedness.

1.2 Macro-financial conditions in Jamaica

Despite elevated inflation and ongoing uncertainty due to geopolitical tensions during 2023, Bank of Jamaica's composite indices of macro-financial conditions mostly reflected improvement. The quarterly Aggregate Financial Stability Index (AFSI) remained relatively unchanged at an average of 0.49 for 2023 compared to 2022 (see **Figure** 1.1), reflecting decreases in the Financial Vulnerability Index partly offset by an uptick in the World Economic Climate Index (WECI).[2] The fall in the financial vulnerability sub-index reflected elevated domestic inflation while the improvement in the WECI was due to the moderation in global inflation.[3]

Figure 1.1 Aggregate financial stability index



Source: BOJ

The Macro-financial Index (MaFI) improved in 2023, as reflected in a decrease in the average index to 24.5 for 2023 from 30.8 for 2022 (see **Figure** 1.2).[4] This outturn largely reflected improvement in the macro-fiscal landscape as

[1] Stress tests for DTIs were conducted as at end-2023 while SDs were subject to stress tests as at end-September 2023

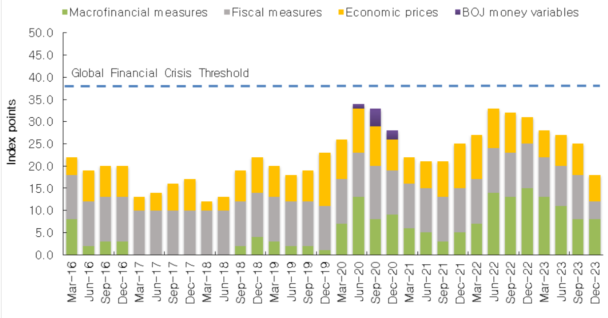
[2] The AFSI summarizes the impact of changes in microeconomic, macroeconomic and international factors to form a single measure of financial stability. A higher value indicates increased financial stability while a lower value indicates a deterioration in financial sector stability. The AFSI is a weighted average of normalized balance sheet and macroeconomic indicators which collectively capture (i) financial development (FDI), (ii) financial vulnerability (FVI), and (iii) financial soundness (FSI) and World Economic Climate Index (WECI). The construction and interpretation of the AFSI is described by Morris, V., Measuring and Forecasting Financial Stability: The Composition of an Aggregate Financial Stability Index for Jamaica, 2010.

[3] Of note, while non-performing loans (NPL) as a ratio of total loans was unchanged, the probability of the risk of insolvency (Z score) decreased.

[4] The MaFI are signal-based indices computed using scores for indicators based on the number of standard deviations of each indicator from its 'tranquil period' mean value. The tranquil period for both indices spans the period March 2002 to March 2003. The scores range from 0 to 5 with a score of 5 representing the most severe signal. The higher the aggregate score, the more severe

contractionary monetary conditions caused inflation to fall towards the BOJ's target range. Fiscal conditions also improved as several domestic and external bonds matured during 2023, which led to lowering of the debt stock. The MaFI in 2023 continued to remain below the early warning threshold value of 37.0 points that signals financial instability.

Figure 1.2 Macro-financial index



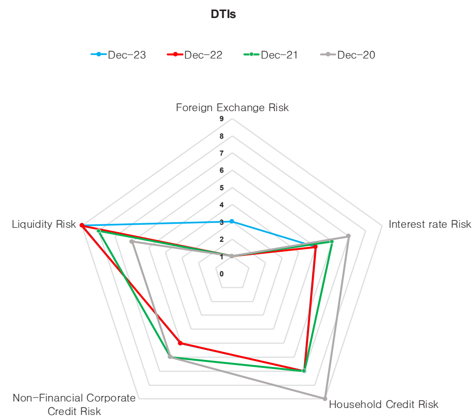
Source: BOJ

1.3 Evolution of financial risks during 2023

For 2023, financial institutions' risk indicators showed mixed results, relative to 2022. The financial risk exposure "cobweb" for DTIs, which measures annual average exposure to financial risks, showed that liquidity risk, interest rate and credit risks remained unchanged.[5] DTIs were, however, more exposed to foreign exchange risks relative to 2022 (see **Figure 1.3**) (see **Chapter 4**).

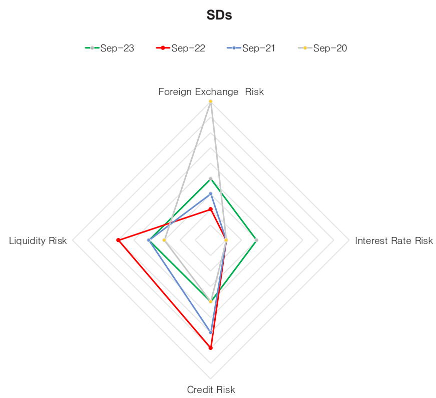
The securities dealers' financial risk exposure "cobweb" also showed mixed results at end September 2023, relative to end-September 2022 (see **Figure 1.4**).[6] There were improvements in liquidity and credit exposures for the review period. The performance of the credit risk dimension reflected an improvement in the NPL ratio during the review period. Additionally, the improvement in the liquidity risk dimension reflected an increase in liquid assets. However, securities dealers became more exposed to foreign exchange risks due to an increase in their foreign currency liabilities, relative to total liabilities. In addition, their exposure to interest rate risks rose, reflecting increases in GOJ global bond yields.

Figure 1.3 Financial Risk Exposures of DTIs



Source: BOJ

Figure 1.4 Evolution of risk exposure indicators for the 12 largest SDs



Source: BOJ

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the signal. The construction and interpretation of the MaFI is described by Langrin, R., An Early Warning System for the Prevention of Banking Sector Crisis in Jamaica, 2002.

5 Movements away from the centre of the diagram represent an increase in DTIs' risk exposures and vice versa. The risk exposure indicators are: (i) Foreign exchange risk – Net open position/Capital; Loans to Non-FX earners/Total FX loans (ii) Interest rate risk – Cumulative maturity gap of up to 30 days/Assets; Cumulative maturity gap of up to 90 days/Assets; (iii) Credit Risk – NPL/Total loans. Liquidity Risk – Liquid assets/total assets, liquid assets to short-term liabilities

6 The analysis is based on a representative sample of twelve SDs.

1.5 Risk Channels

Fair value losses incurred by Jamaican DTIs and securities dealers, which reflect the impact of interest rate shocks, averaged 3.5 per cent and 12.6 per cent of regulatory capital for 2023, respectively.[7] This was lower than the average losses of 9.0 per cent and 13.0 per cent of capital during 2022.[8] These fair value losses occurred due to the relatively large exposure of financial institutions to price declines in both GOJ domestic and global bonds in the context of monetary tightening by the major central banks.[9]

As it relates to equities, the Main Jamaica Stock Exchange Index continued its trend decline in 2023, albeit marginally slower (–8.5%) than the prior year (–10.2%). The decline in the stock market continue to reflect the impact of higher interest rates as investors diverted funds from riskier investments towards more attractive fixed income assets. Equity price risk, however, remained fairly low for DTIs and securities dealers given their relatively low exposure relative to capital (see **Chapter 2**).

In 2023, the NPL ratio for the banking system remained low and well below the prudential threshold of 10.0 per cent.[10] In relation to liquidity risk, DTIs continued to maintain adequate levels of liquidity during 2023, with the liquidity coverage ratio averaging well above the prudential minimum of 100.0 per cent.[11]

Sustained geopolitical tensions could, however, put upward pressure on inflation in the future through increases in commodity prices and supply chain disruptions. Persistent inflationary pressure could result in further increases in interest rates and volatility in asset prices, leading to further fair value losses for financial institutions.

Interest rate shocks could also affect credit and liquidity risks. If interest rates rise further, the debt servicing ability of households and businesses could be negatively affected, resulting in NPL increases for banks. Increased interest rates also imply declines in the deposits and repo liabilities of the system as depositors and investors search for greater returns.

Given the highly interconnected nature of the Jamaican financial system and the existence of systemically important financial institution (SIFIs), any stress by a financial institution from shocks has the potential for spill over and contagion risks (see **4.6: Interlinkages in the Financial System**).

1.7 Quantifying the impact of Selected Shocks

Based on the risks highlighted above, four single–factor stress tests, an aggregated stress test as well as a second–round impact assessment, were conducted.

[7] Increases in bond yields negatively affect financial institutions' balance sheets through revaluation or fair value losses. In particular, when bond yields increase, this results in reductions in bond prices and consequently fair value losses. If the affected securities are sold during a period in which the price of these bonds are relatively low, this will result in realized losses and consequently lower profits. In addition, if institutions have insufficient buffer capital then this may result in reductions in financial institutions' capital base and may impact their capital adequacy. The GOJ Global Bond Composite Index was used to measure the changes in bond yields over the review period. In particular, GOJ bond yields rose by 171.7 bps for 2023, relative to an increase of 36.3 bps for 2022

[8] Fair value loss is computed as the difference between the current/present market value of the securities and the acquisition cost of the securities. Average fair value losses/capital for DTIs reflected quarterly average up to December 2023, while for securities dealers the average ratio during 2023 is up to September 2023 due to data availability.

[9] DTIs' holdings of GOJ bonds, as a proportion of total investments, was 44.3 per cent at end–2023, relative to 47.4 per cent at end–2022. For securities dealers, GOJ bond holdings represented 25.5 per cent of total investments at end–September 2023, compared to 24.2 per cent at end–2022.

[10] DTI's NPL ratio averaged 2.4 percent in 2023.

[11] For DTIs the average LCR was 285.4 percent as at end 2023. This ranged between 153.0 percent and 629.4 per cent, respectively. Furthermore, SDs liquid asset ratio increased by 0.7 percentage point to 14.2 per cent at–end September 2023.

These simulations were utilised to determine the resilience of domestic financial institutions to further increases in bond yields, declines in equity prices, increases in NPLs, deposit/repos withdrawals and potential interbank contagion effects.

1.8 Stress test assumptions

Market risk stress tests assesses the impact of increases in bond yields and reductions in equity prices on DTIs' and securities dealers' capital adequacy ratios (CARs). The interest rate risk scenario involves domestic and foreign bond yields rising by 125 basis points (bps) and 100 bps, respectively.[12] The magnitude of the interest rate shock is established using the assumed relationship between the policy rate and the market interest rates under the assumption that there is a 1:1 pass through of policy rate interventions to domestic bond yields. As such, we assume a plausible level of further monetary tightening of 125 bps in 2024, in response to inflation remaining elevated. It is also assumed that this pass through will be softer on the foreign denominated global bonds.

For equities, the scenario involved a 15.0 per cent decline in stock market performance. An empirical assessment of the relationship between stock market and interest rate established that a 1% increase in interest rate results in a 0.2% fall in stock prices. As such, the assumed interest shock would translate to 5% decline in stock market performance. This shock was augmented upwards to account for knock on effects from current and anticipated economic slowdown and change in investors' sentiments. As such, 15.0 per cent is set as the magnitude of the shock as this represents a plausible degree of fallout under the scenario.

The credit risk stress test assesses the impact of a rise in non-performing loans on the solvency of financial institutions as a result of tighter monetary conditions. The credit shock impacts provisioning for NPLs and loss in interest income.[13] Regarding credit risk, empirical evidence has established a 1% increase in interest rate would result in a 1.8% increase in NPLs. Therefore, our assumed 125 bps increase in domestic bond yields corresponds with an increase in NPLS of approximately 20%.

The liquidity stress test was utilized to evaluate the impact of a 20 per cent deposit reduction, and a drawdown in repo liabilities on DTIs' and securities dealers' capital position, respectively.[14] The aggregate stress test gives the combined impact of the interest rate, credit, liquidity and equity risk shocks on the capital adequacy ratio. The applied liquidity stress test shock was 20 per cent. Due to the unclear link between interest rates and liquidity risk, the shock's severity was comparable to changes in deposits seen during the global crisis.

Simulations were also conducted to evaluate the second-round impact on the financial system of the combined shocks noted above. A contagion stress test examines the potential for distress from one financial institution to spillover onto other institutions within the financial system.

The stress testing shocks in **Table 1.5** were applied to the balance sheet of financial institutions based on data as at end-2023.[15]

[12] As a result of the increases in GOJ bond yields, the market value of these securities was computed and the derived fair value losses were deducted from available buffer capital. If the buffer capital was insufficient to cover losses, the residual losses were deducted from statutory capital and the corresponding post-shock CAR re-calibrated.

[13] As such, an adjustment is made to capital, while risk weighted assets (RWA) is adjusted for the increase in provisioning only. If buffer capital is not enough to absorb the losses, the residue affects the statutory capital base. A 100 per cent provisioning rate was utilized.

[14] The assumed withdrawal reduces the liquid assets of the institutions where they are available. If liquid assets are insufficient, non-liquid assets are liquidated, which occasions a reduction in net income arising from haircuts on the liquidated assets. These reductions are deducted from statutory capital and the post-shock capital adequacy ratio re-computed.

[15] Due to data availability, data for securities dealers were as at end-September 2023.

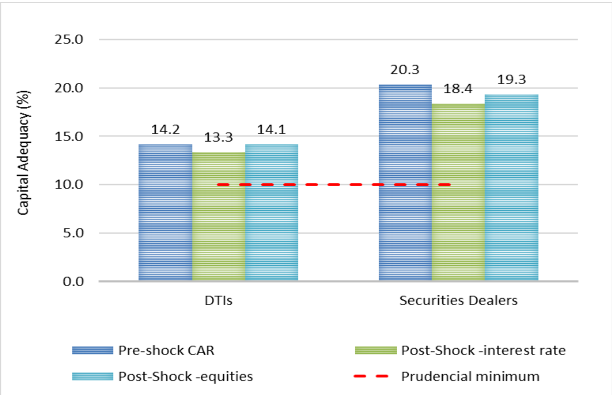
Table 1.5 Stress testing shocks

Risk	Risk Factors	Adverse
Market	Bond yields increase: Domestic Global bond yields	 125 bps 100 bps
	Fall in equities	15%
Credit	NPLs increase:	20%
Liquidity	Deposit/Repo withdrawal	20%
Aggregated stress tests		

1.9 Stress test results

The interest rate risk results indicate that both sectors were generally resilient to the contemplated increases in GOJ bond yields.[16] In particular, the post-shock CAR for the DTI and securities dealers sector declines marginally by 0.8 percentage point and 2.0 percentage points, relative to the pre-shock CARs. The resilience was largely due to the sectors' strong levels of capitalization (see **Figure 1.6**).

Figure 1.6 Market risk stress test results showing post-shock CARs for DTIs and securities dealers



For the shock to equity prices, the results show that the DTI and securities dealers' sectors remain robust to the contemplated shocks, due mainly to their low exposure to equities (see **Figure 1.6**).[17]

The findings from the credit risk stress test shows that DTIs also remain generally resilient to the anticipated shocks to NPLs. The sector's post-shock CAR declines marginally by 0.2 percentage point remaining above the prudential minimum of 10.0 per cent (see **Figure 1.7**).

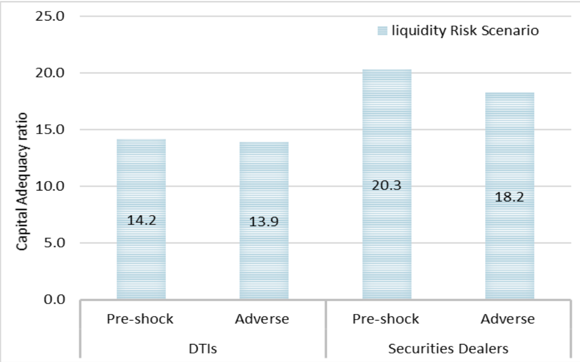
Figure 1. 7 Credit risk stress test results showing post-shock DTIs CARs

For the liquidity assessment, the DTIs and securities dealers are largely resilient to the contemplated withdrawals. In particular, the post-shock CAR for the DTI sector declines slightly by 0.3 percentage points. The securities dealers' sector post-shock CAR, however, declines by 2.1 percentage points. Notably, both sectors' CAR remained above their prudential minima (see **Figure 1.8**).

[16] As a result of selected shocks/increases in yields, the new market value of these securities (GOJ bonds) are recalibrated using the price formula. Next, the fair value loss is derived and deducted from available buffer capital. However, if the buffer capital is insufficient to cover losses, the residual FV loss is deducted from statutory capital and the corresponding post-shock CAR is calibrated.

[17] The post-shock decline in the value of equities holdings is deducted from available buffer capital If the buffer capital is insufficient to cover losses, the residual losses are deducted from statutory capital and the corresponding post-shock CAR re-calibrated.

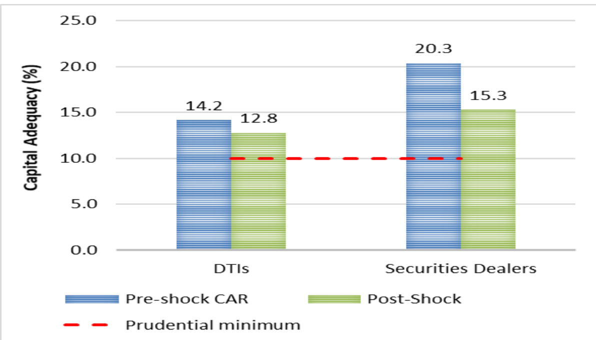
Figure 1.8 Liquidity risk stress test results showing post-shock DTIs and SDs CARs



1.9 Stress test results for combined risk scenario

The combined risk assessment shows that the securities dealers and DTIs remain resilient under the contemplated scenarios. The post-shock CAR for the DTI sector declines by 1.4 percentage points to 12.8 per cent while the CAR for the securities dealers' declines by 5.1 percentage points to 15.3 per cent (see **Figure 1.9**). DTIs are mainly impacted by fair value losses while the hypothetical pass through to capital from equity risk was the least material. SDs are most susceptible to the contemplated liquidity and interest rate shocks.

Figure 1.9 Aggregate risk stress test results showing post-shock DTI and SD CARs



1.10 Second-round Impact Simulation

The index of contagion (IoC) highlights that, while the domestic financial system remain highly interconnected, its vulnerability to contagion and spill over risks was stable relative to 2022.[18] For 2023, the average IoC for DTIs and securities dealers indicates that a defaulting institution would, on average, cause a 2.2 per cent loss in capital for its counterparties, which was relatively unchanged when compared to 2022.[19] The maximum loss caused by an institution was 9.1 per cent, compared to a minimum of 0.1 per cent. Notable spill over risks however emanates from intra-financial group relationships.

1.4 Emerging risks and vulnerabilities

Climate-related financial risks, cyber security threats and escalation of geopolitical tensions are three key risks faced by the Jamaican financial system. In the context of the imminent threat and potential material impact of a climate-related event to the Jamaican financial system and economy at large, the Bank took steps to address this issue (see **Thematic Study 2: Building Climate Resilience in Jamaica's Financial Sector**). Supported by funding from the French Development Agency and the European Union Caribbean Investment Fund, BOJ has been engaged in a multi-year project focused on enhancing Jamaica's regulatory capacity to identify and manage these risks. The project is being implemented in two phases and is expected to be completed in 2026. At end-2023, some of the main outputs were: a) the conduct of a survey with key financial institutions; b) a report on climate related financial risks; and c) a nationwide data gap analysis.

Some of the initiatives that are intended to be deployed under this project include:

1. Creation of TCFD compliant reports for both the Supervisors and licensees;

[18] The index of contagion represents the average percentage of loss in other financial intuitions' capital base due to the failure of the specific institution.

[19] There were similar results at end-2022, with an average loss of 2.2 per cent.

2. Conducting supervisory assessments of the financial sector's climate-related systemic risks; and

3. Embedding climate risk into supervisory reviews, updating prudential supervision policies to include guidance on climate risk management, disclosures and standardization to facilitate benchmarking and comparison.

The Bank also intends to develop awareness programmes and the capacity of staff at BOJ, Jamaica Deposit Insurance Corporation (JDIC), Financial Services Commission (FSC) and supervised entities. This will aid in enhancing the abilities of relevant stakeholders to evaluate climate-related risks through scenario and stress test exercises while enhancing supervisory oversight through ongoing monitoring and enhanced data aggregation.

The Jamaican financial system has become more digitized and these technologies and online platforms have changed the way in which clients interact with the financial system. Notwithstanding the benefits, digitization exposes financial institutions' clients to a range of cyberthreats. A successful cyberattack may cause monetary losses, reputational damage and interruption of critical financial services.

As cyber risk continues to evolve globally, quantifying and mitigating these exposures has become more complex. As a result, financial institutions are being forced bolster their cybersecurity safeguards. More importantly, monitoring cyber risk is crucial for regulators to protect financial system stability. This will ensure consumer protection, promote compliance and risk management, facilitate collaboration as well as help to develop effective policies.

Regulators, globally, have taken several measures to ensure resilience to cyber risk. These measures include:

1. Developing regulatory frameworks that outline cybersecurity requirements as well as to provide guidance and best practices;

2. Promoting information sharing and collaboration such as threat intelligence among financial institutions, regulatory bodies and cybersecurity experts;

3. Conducting cybersecurity assessments of financial institutions to evaluate their resilience to cyber risk;

4. Requiring financial institutions to have robust incident response plans as well as mandating the reporting of cybersecurity incidents to regulators; and

5. Encouraging institutions to provide cybersecurity training and awareness to employees and customers.

Bank of Jamaica achieved noteworthy advancements in relation to enhancing resilience to cyber-risk by the crafting of a Cyber Resilience Framework with the publication *"10 Cyber Resilience Principles, and the issuance of the Standard of Sound Practice on the Management of Cyber Risks"* in December 2023 (see Thematic Study 1: Cyber Risk and the Adoption of a Cyber Resilience Framework).

Importantly, collaboration between the BOJ, other regulators and the industry is essential to enhance the cybersecurity of banks and financial institutions by enabling a comprehensive approach to tackling cyber risk.

Jamaican financial institutions have also heightened measures to safeguard their networks and client information. These include investing in intrusion detection systems, firewalls and encryption technology and performing frequent vulnerability and risk assessments.

1.11 Summary and Risk Mitigation Measures

During 2023, there were moderate risks to financial system stability as inflation and interest rates remained elevated. Specifically, the higher interest rate environment led to increased funding costs and market risks for financial institutions, particularly fair value losses. Throughout the year, the supervisors heightened surveillance of the financial system to contain the likelihood of capital impairment arising from falling asset prices. A few institutions also took pre-emptive measures to bolster their capital levels to prudently manage exposures to market and other risks.

Notwithstanding these risks, standard indicators of financial health, in particular, capitalization, liquidity, profitability and asset quality measures remained generally stable. However, the trajectory for, and implications of, changes in interest rates is uncertain. Given, the results of the macro-prudential stress tests showed that the DTI and securities dealers' sectors are broadly resilient to the contemplated shocks.

During 2023, the authorities advanced work on key pieces of legislation and regulatory guidelines aimed at strengthening the supervisory landscape. Specifically, Bank of Jamaica continued to make progress on the implementation and operationalization of the Basel III Framework. One important aspect of this framework is that it will require financial institutions to hold higher quantity and quality of capital. More precisely, Bank of Jamaica published a consultation paper on the Capital Conservation Buffer (CCB) to be applied to DTIs and financial holding companies (FHCs) licensed under the Banking Services Act, 2014 (BSA) during the first half of 202320. Under the proposed CCB, licensees will be required to hold additional regulatory capital of 2.5 per cent of risk weighted assets (RWA) in normal times, unless otherwise approved by the Supervisor. The main purpose of the CCB is to provide licensees with a cushion of high-quality capital above the minimum capital adequacy requirement (CAR) that can be used to absorb losses without breaching the Bank's minimum CAR. The CCB is expected to improve the resilience of the financial system through the accumulation and maintenance of adequate loss absorbing capital.

In the second half of 2023, Bank of Jamaica published a consultation paper on a systemic risk buffer (SyRB) for domestic systemically important financial institutions (D-SIFIs). [20] This consultation paper outlined the framework for the designation and applicable capital risk surcharge for D-SIFIs in Jamaica. The SyRB will increase the loss absorbency capacity of systemically important deposit-taking institutions and securities dealers to cope with adverse events.

Additionally, the Bank will continue to support the development of a Special Resolution Regime (SRR) for financial institutions and the Twin Peaks Model. The SRR will establish an approach to resolution under which non-viable financial institutions, which are deemed systemically important, can be resolved. As it relates to the "Twin Peaks Model", plans are in place to coordinate with the Financial Services Commission to develop standards of sound practice, supervisory manuals and rules that will support the operation of the micro-prudential "Peak" of the regime.

Furthermore, Supervisors have noted the spate of cyberattacks on financial institutions in the recent past and have enhanced their monitoring of the system. The Authorities also issued a set of

[20] The systemic risk buffer is a requirement for larger more complex and interconnected banks to hold higher capital. The goal is to directly target "too-big-to-fail" concerns surrounding these types of entities to reduce the possibility of government bailouts by having these institutions self-insure against severe financial crisis. The countercyclical capital buffer is a time varying capital requirement. It requires banks to increase capital at times when credit is growing rapidly so that buffer can be reduced if the economic and financial environment becomes substantially worse.

principles that guides financial institutions in addressing vulnerabilities to cyber events. Supervisors are also consulting with their licensees and actively encouraging mechanisms among them for strong cyber-attack resistance and cyber-attack recovery.

The Bank published a set of commitments that they will pursue to enhance the climate resilience of the financial sector over the medium-term.

For securities dealers, the Financial Services Commission (FSC) consulted on two guidelines during 2023. A Dividend Distribution Guideline which provides guidance around final and interim dividend payments as well as a Collective Investment Scheme Guideline which introduces a limit for portfolios and guidance around conflict-of-interest policies. Additionally, the Digital Assets Advisory was revised during the year.

2.0 FINANCIAL SYSTEM SECTORAL EXPOSURE

This chapter presents the exposures of the financial system due to various asset classes

2.1 Overview

In 2023, DTIs' exposure to the household (HH) sector rose above the ten-year historical average. However, HHs' non-performing loans as a share of total HH loans remained stable. Moreover, there was an improvement in HHs' debt servicing capacity.

DTIs' exposure to the corporate sector as well as corporate sector loan quality remained stable for 2023. Concurrently, public sector debt to GDP declined for the review period, reflecting continued fiscal policy efforts to lower the Government's debt burden.

Securities dealers' (SDs') exposure to private sector debt declined while loan quality remained stable during 2023. NDTFIs' exposure to equities and real estate assets remained relatively low during the review period. Meanwhile, the pensions industry continued to have the highest exposure to "investment arrangements".

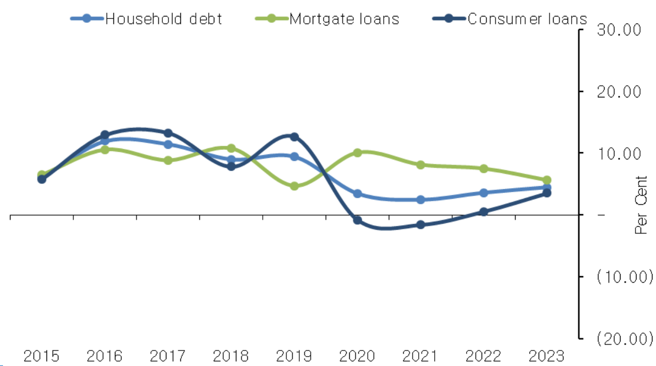
2.2 HH debt and deposit-taking institutions' exposure

In 2023, HH sector debt held by DTIs grew, reflecting the impact of the continued rebound in economic activity. In real terms, HH sector debt grew by 4.5 per cent for 2023, following growth of 3.6 per cent for 2022 (see **Figure 2.1**).[76] In this context, HH debt to total assets increased to 27.5 per cent at end-2023, relative to the ten-year historical average of 25.1 per cent and growth of 26.8 per cent at end-2022. However, relative to its credit portfolio, DTIs' HH sector debt, remained relatively stable at 61.2 per cent at end-2023, compared to the share for 2022 (see **Figure 2.2**).

The acceleration in the growth in HH debt largely reflected an increase in the real value of mortgage loans issued by DTIs. For 2023, mortgage loans grew by 5.6 per cent, albeit, at a slower pace than the previous year's growth of 7.5 per cent. This deceleration occurred in the context of an increase in real mortgage loan rates offered by DTIs (see **Table 2.1**). On the other hand, consumer real loan growth accelerated to 3.5 per cent relative to an increase of 0.6 per cent for 2022.

HH loan quality remained stable for 2023, relative to the outturn for 2022. The HH sector's non-performing loans as a share of total HH loans was relatively unchanged at 4.1 per cent at end-2023. Furthermore, DTIs continued to maintain adequate coverage of NPLs for the HH sector, with the sector's loan loss provisions plus prudential provisioning to non-performing HH loans ratio exceeding 100.0 per cent for the review period (see **Figure 2.3**).

Figure 2.1 Real growth in HH debt and its sub-components for DTIs



[76] HH debt incurred with DTIs is proxied by the sum of residential mortgage loans and consumer loans (which includes credit card receivables).

Figure 2.2 HH debt as a share of DTIs' loans & assets

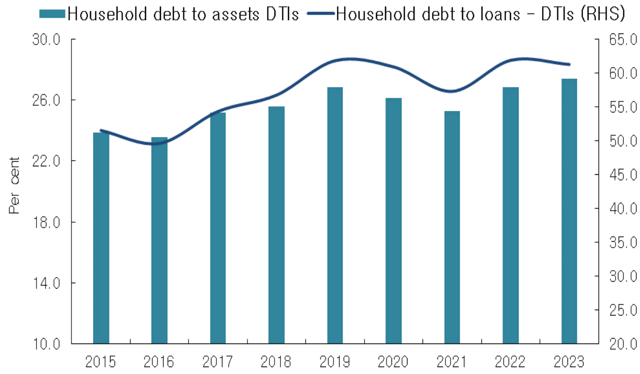


Figure 2.3 DTIs' HH sector loan quality & loan loss provisioning to HH sector NPLs

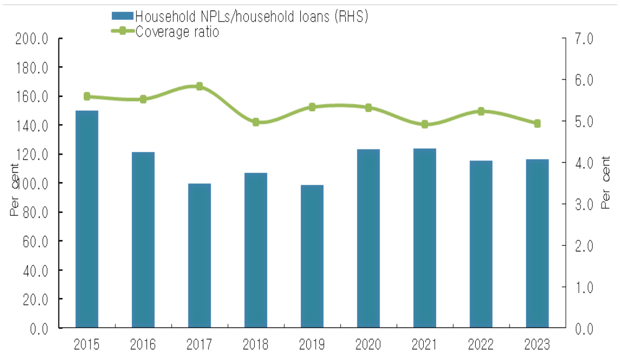
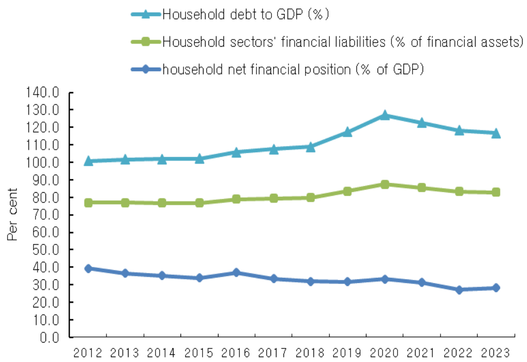


Table 2.1 Selected interest rates

Sectoral Interest Rates (per cent)	2020	2021	2022	2023	Change*
Building societies					
Real Mortgage Loans Rate*	2.1	-0.1	-2.0	0.9	2.9
Mortgage Loans Rate	7.4	7.2	7.2	7.8	0.6
Average Weighted Loan Rate	7.5	7.2	7.3	8.2	0.9
Commercial banks					
Real Mortgage Loans Rate*	2.0	-0.3	-2.8	0.5	3.3
Mortgage Loans Rate	7.3	7.0	6.2	7.4	1.2
Installment Credit Rate	10.7	10.7	11.9	11.0	-1.0
Personal Credit Rate	20.9	20.8	38.4	23.4	-14.9
Commercial Credit Rate	9.4	9.3	8.5	9.9	1.4
Average Weighted Loan Rate	11.8	11.5	11.7	12.0	0.3
Merchant bank					
Personal Credit Rate	7.8	7.6	8.6	8.8	0.2
Commercial Credit Rate	8.0	7.5	8.5	9.1	0.7
AverageWeighted Loan Rate	7.9	7.6	8.6	9.0	0.4

Figure 2.4 HH sector indebtedness indicators



2.2.1 HH sector indebtedness

The debt servicing capacity of HH, measured by the ratio of HH debt to GDP, marginally improved in 2023. Specifically, the ratio of household debt to GDP decreased by 1.0 percentage point to 33.9 per cent, relative to 2022 (see **Figure 2.4**).[77,78] The improvement reflected a faster pace of growth in nominal GDP relative to HH debt.[79] Similarly, other HH sector debt sustainability measures showed general improvement for 2023, when compared to the prior year (see **Figure 2.4**).

2.3 Deposit-taking institutions' large asset exposures and exposure to corporate sector debt

DTIs' exposure to the top 5 economic sectors based on the share of large asset exposures remained relatively stable during 2023. DTIs' exposures to Financial Institutions, their largest exposure, decreased slightly to 29.7 per cent at end December-2023 from 33.4 per cent at end-December 2022.[80] Similarly, there were slight declines in exposure to Tourism and the public sector while Distribution and Overseas Residents

[77] Total HH debt is proxied by the sum of residential mortgage loans, consumer loans (which includes credit card receivables) and National Housing Trust loans.

[78] BOJ's projection for disposable income is computed as gross personal income less statutory deductions. Gross personal income is proxied as the sum of compensation to employees domestically and from the rest of the world as well as current transfers from rest of the world (which primarily includes remittances). Operating surplus of the HH sector is excluded from personal income due to data availability.

[79] The nominal GDP figure is estimated for December 2023

[80] DTIs' large asset exposures includes the sum of exposures to placements, loans and advances, investments, other on balance sheet exposures and off-balance sheet exposures by economic sector

increased slightly for the review period (see Figure 2.5).

DTIs' exposure to the corporate sector, as measured by corporate sector debt to DTIs' assets, increased slightly during 2023. This ratio increased to 22.0 from 21.7 at end 2022, reflecting a faster growth in lending to the corporate sector compared to that of DTIs' asset base (see Figure 2.6).[81,82] In real terms, corporate sector debt held by DTIs grew by 3.5 per cent for 2023 in contrast to a contraction of 0.2 per cent for 2022. Lending to each of the top five economic sectors grew. However, *Tourism* and *Manufacturing* recorded slower growth rates compared to 2022 (see Figure 2.7).[83]

DTIs' lending to overseas residents trended upwards, however, exposure remains low. Loans to overseas residents has increased significantly over the past several years, growing at an average annual rate of 22.8 per cent since 2017.[84] Despite this increase, DTIs' exposure, as measured by overseas loans to residents to total assets remained low at 4.8 per cent for the year end–2023, relative to 5.0 per cent for the year end–2022. A similar trend has been observed for lending to overseas non– financial corporates, likewise, exposure remains minimal. (see Box 1.0: Bank Exposures to Overseas Non–Financial Corporates)

2.3.1 Corporate sector loan quality

The quality of DTIs' corporate sector loans remained stable for 2023. In particular, the NPL ratios for most sectors were relatively unchanged at 1.0 per cent for the review period (see Figure 2.8). However, there was deterioration in the NPL ratios for *Agriculture, Mining and Quarrying*, *Distribution,* and *Entertainment*. Of note, *Professional and Other Services* recorded the largest improvement of 1.5 percentage points in loan quality, while *Mining and Quarrying* recorded the largest deterioration of 7.4 percentage points.

Figure 2.5 Trends in large exposure assets by economic sector – DTIs

Figure 2.6 Real growth in corporate debt held by DTIs & corporate debt as a share of DTIs' assets

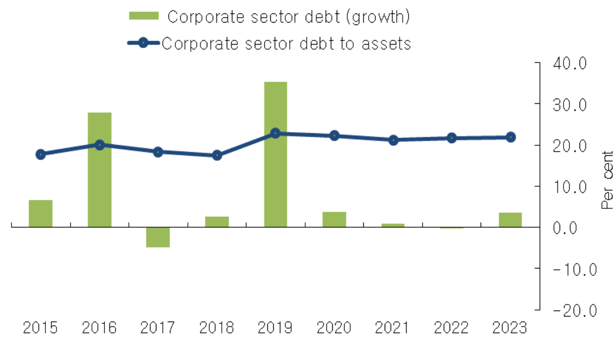
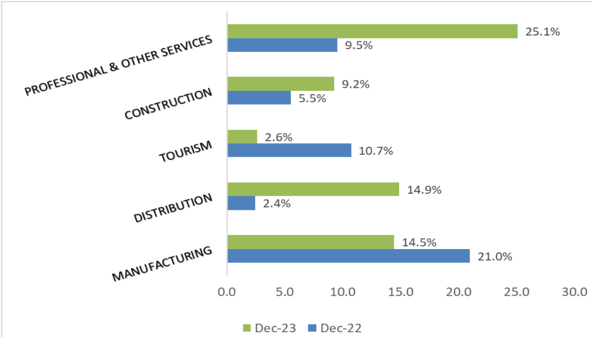


Figure 2.7 Growth in DTIs' lending to the top five corporate sectors



81 DTIs corporate sector debt to DTIs assets is also above the historical average of 19.8 per cent for the past ten–years.
82 Corporate sector debt includes loans for commercial purposes and notes & debenture holdings of DTIs.
83 The top five economic sectors are determined based on share of total loans.
84 Loans to oversees residents includes public sector, financial institutions, corporates and individuals who reside overseas.

Figure 2.8 Ratio of corporate sector NPLs to corporate sector loans for Top 5 sectors–DTIs

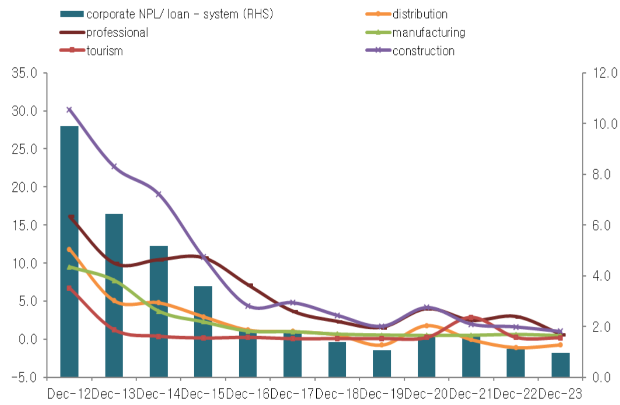


Figure 2.9 Corporate sector debt to corporate operating surplus

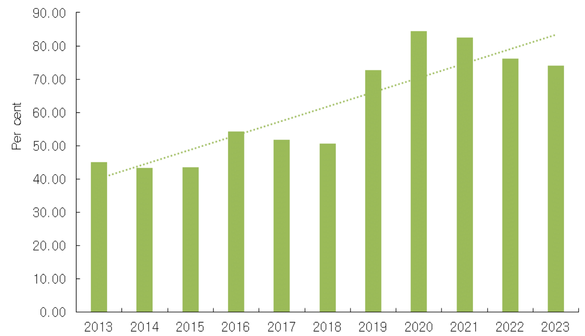
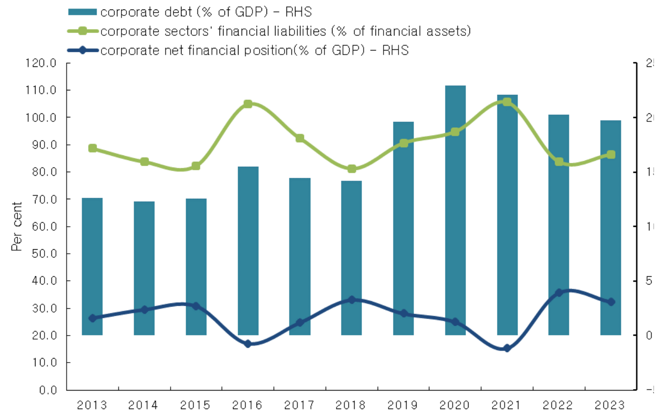


Figure 2.10 Other corporate sector indebtedness indicators



2.3.2 Corporate sector indebtedness

The debt servicing capacity of the corporate sector showed mixed performance during 2023. The corporate sector debt to operating surplus ratio declined to 74.0 per cent at end-2023, from 82.4 per cent at end-2022. This outturn reflected a faster pace of growth in operating surplus relative to corporate sector debt (see **Figure 2.9**). In contrast, corporate sector net financial position as a share of GDP worsened marginally, declining to 3.1 per cent at end-2023 from 3.9 per cent at end-2022. This outturn represented a slight fall in corporate sector net financial position coupled with growth in GDP. Similarly, corporate sector financial liabilities as a share of corporate sector assets worsened, reflecting an increase of 2.7 percentage points to 86.4 per cent at end-2023. This increase reflected a faster pace of growth in liabilities relative to the growth in assets (see **Figure 2.10**).[85]

2.4. Public sector performance & indebtedness

Within the context of the continued rebound in economic activity and consistent fiscal efforts to lower the debt burden, public sector debt to GDP continued on a downward trajectory during the review year. The ratio fell to 74.2 per cent at end-December 2023, from 82.4 per cent at end-December 2022 (see **Figure 2.11**). This performance reflected a faster pace of growth in nominal GDP relative to the growth in public sector debt. The growth in the public sector debt stock reflected an increase of 4.7 per cent in the external debt stock and a decline of 1.8 per cent in domestic debt (see **Figure 2.12**).

85 The financial assets of corporates include: deposits and retail repos. Corporate financial liabilities include: loans for commercial purposes as well as notes & debenture holdings of DTIs (notes and debentures figure used is as at December 2023). Corporate financial assets do not capture large shares and other classes of corporate assets

Figure 2.11 Debt to GDP ratios

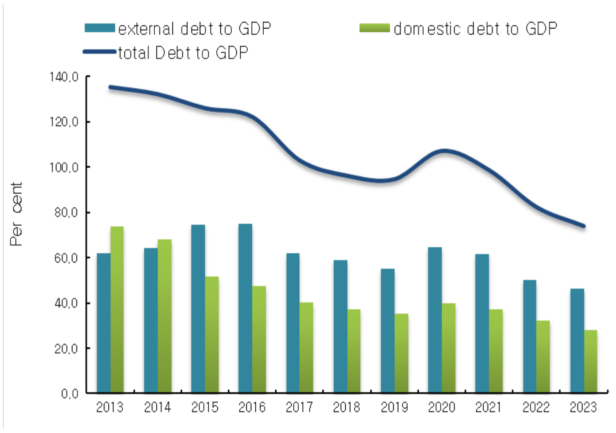


Figure 2.12 Growth in public sector debt stock

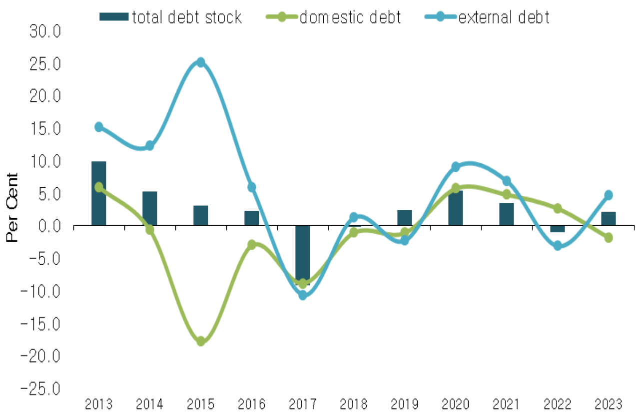


Figure 2.13 Public Sector domestic debt by maturity

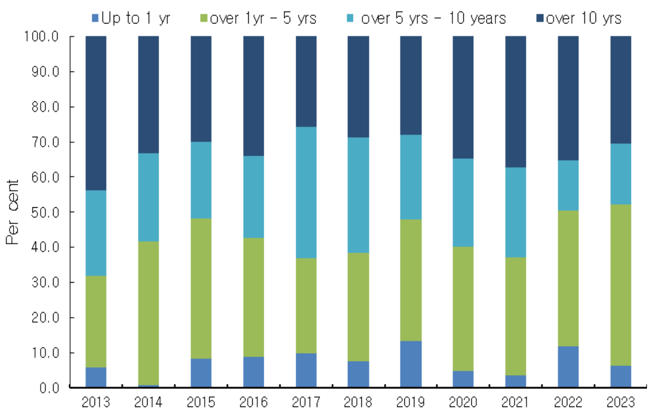
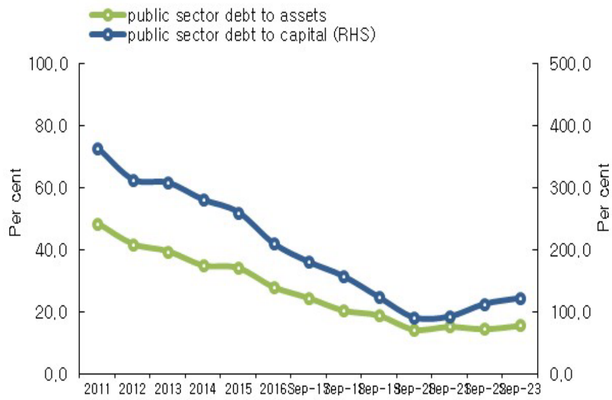


Table 2.2 Share of public sector domestic debt by instrument type (%)

	Fixed rate	Variable rate	Non Interest Bearing Debt
2013	67.9	32.0	0.1
2014	67.7	32.2	0.1
2015	60.8	39.2	0.1
2016	59.6	40.4	0.1
2017	55.7	44.3	0.0
2018	62.3	37.7	0.0
2019	63.0	37.0	0.0
2020	76.1	23.9	0.0
2021	77.5	22.5	0.0
2022	78.0	22.0	0.0
2023	82.8	17.2	0.0

Figure 2.14 Public sector debt holdings to assets & capital for securities dealers



The maturity profile of domestic public debt showed an improvement in refinancing risk over the review period.[86] In particular, the proportion of debt due to mature within 1 year decreased to 6.4 per cent from 11.9 per cent the previous year.[87,88] However, refinancing risk in the medium-term increased to 45.8 per cent at end-December 2023, from 38.5 per cent at end-2022, reflecting a rise in the portion of domestic debt due to mature in 1 to 5 years (see **Figure 2.13**). Domestic fixed rate instruments continued to account for the largest share of the total debt stock increasing to 82.8 per cent at end-December 2023, from 78.0 per cent at end-December 2022 (see **Table 2.2**).

2.5. Non-deposit-taking financial institutions' exposure to private and public sector debt

2.5.1 Securities dealers' exposure to public sector debt

Securities dealers' exposure to public sector debt trended upward for the end-September 2023. In particular, the ratio of SDs' holding of public sector debt to assets increased to 15.6 per cent at end-September 2023 from 14.5 per cent at end- September 2022. Similarly, SDs' public sector debt holdings to capital increased to 122.3 per cent at end-September 2023 from 113.1. per cent at end-September 2022. This outturn was due to a larger increase in SDs' holdings of public sector securities relative to the increases in SDs' assets and capital. (see **Figure 2.14**).

2.6 NDTFIs and DTIs exposure to real estate and equity

NDTFIs' exposure to equities and real estate assets remained relatively low during the review period. At end-September 2023, securities dealers' and insurance companies' equity investments as a proportion of assets were stable at 3.5 per cent and 10.4 per cent, respectively, relative to end-September 2022. Furthermore, the insurance sector's exposure to real estate investments, as measured by the ratio of real estate investments to total assets, decreased marginally to 2.0 per cent as at September 2023, from 2.4 per cent at September 2022. Of note, DTIs' investment in equities remained below 1.0 per cent of DTIs' asset base (see **Figure 2.15**).[89,90]

Figure 2.15 Investment in other assets for the DTIs, securities dealers & insurance

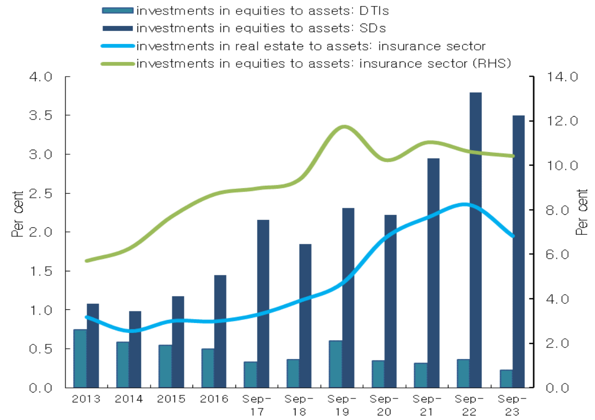


Table 2.3 Investment classes as a per cent of total assets pensions industry

	Sep-19	Sep-20	Sep-21	Sep-22	Sep-23
Investments in Governments Securities to Assets (%)[1/]	20.6	22.3	21.4	20.5	21.0
Investments in Equities to Assets (%)	26.3	21.6	22.6	22.0	20.0
Investments in Real Estate to Assets (%)	3.6	4.4	4.3	4.6	5.5
Investment Arrangements to Assets (%)[2/]	37.4	37.5	38.1	39.1	38.9
Other Investments to Assets (%)	0.6	0.6	0.6	0.4	0.5
Total Asset values (J$BN)	690.0	639.8	696.6	690.9	722.7

86 Refinancing risk is defined as the possibility that a borrower cannot refinance by borrowing to repay existing debt. The higher the maturity the lower the refinancing risk.

87 The domestic debt maturity profile reflects end-October 2023 data.

88 The average proportion in this bucket over the period 2017 to 2022 was 8.6 per cent.

89 Real estate investments include only on-balance sheet positions for the insurance companies.

90 DTIs are restricted from holding real estate for investment purposes and equity investments are limited to 10.0 per cent of regulatory capital. In addition, for collective investment schemes (CIS), illiquid assets, such as real estate, should not exceed 15.0 per cent of the net assets value in the CIS fund.

2.7 Pension industry exposure[91]

At end-September 2023, the pension industry continued to have the highest exposure to investment arrangements relative to other investment classes.[92] Additionally, GOJ securities and equities were also among the largest exposures (see Table 2.3). The exposure of pension funds to the various investment classes were consistent with historical trends. The pension fund industry's exposure to equities continued to decline in 2023, albeit, marginally. The decline reflected the continued shift towards more stable, higher yielding investment classes given the ongoing high interest rate environment.

[91] The data for the industry were as at end-September 2023 due to unavailability of data for the full year.

[92] Investment arrangements consists of a pool of various investments including Deposits, Commercial Paper, Securities of Governments, Repurchase Agreements, Bonds and Debentures, Mortgage, Other Loans, Promissory Notes, Stocks and Shares, Real Estate, Derivatives and other investments

3.0 MACRO-FINANCIAL DEVELOPMENTS

This chapter examines the risks and vulnerabilities of the financial system due to macroeconomic developments

3.1 Overview

The global and domestic macro-financial environment displayed mixed performances for 2023. There was growth in the global economy, albeit at a slower pace than in 2022, supported by a moderation of inflationary pressures and reduced volatility in the international financial markets. Global supply chains largely normalized thus facilitating declines in international commodity prices for the review period. However, despite the moderation in inflationary pressures, inflation remained elevated. These developments occurred in the context of ongoing geopolitical tensions.

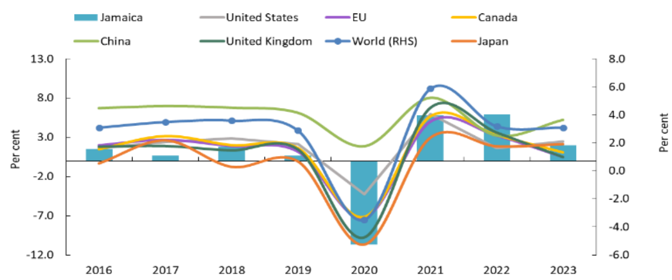
The domestic economy continued to recover throughout 2023, which contributed to improved labour market conditions. Notwithstanding reduced inflationary pressures, primarily stemming from a decline in international commodity prices, inflation remained above the Bank's target range. Consequently, the Bank maintained a tight monetary policy stance.

3.2 Global developments

The performance of the global macro-financial environment was mixed for the review period. The global economy was estimated to have grown by 3.1 per cent for 2023, albeit marginally slower than the growth of 3.5 per cent for 2022 (see Figure 3.1).[13] There was moderation in economic growth in most advanced economies. This was reflective of slower recovery from the effects of the COVID-19 pandemic, ongoing geopolitical tensions and monetary policy tightening aimed at reducing inflation.

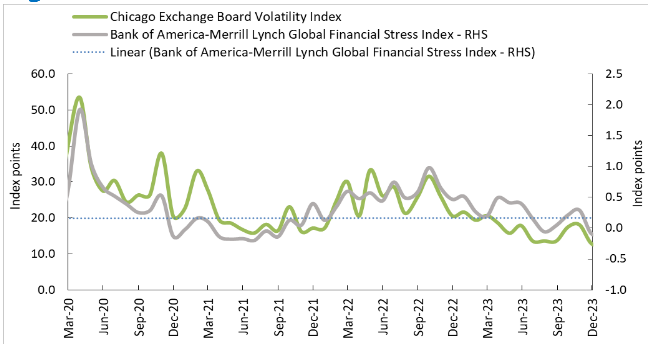
Notably, the post-pandemic normalization of global supply chains facilitated declines in international commodity and shipping prices.[14]

Figure 3.1 GDP growth rates of selected countries



Source: IMF World Economic Outlook

Figure 3.2 International financial market indicators



Source: Bloomberg

Note: (i) The BAML-GFSI is a calculated, cross market measure of risk, hedging demand and investor flows in the global financial system. Values greater than 0 indicate more financial market stress than normal while values less than 0 indicate less financial stress than normal. (ii) The VIX reflects a market estimate of future volatility, based on the weighted average of the implied volatilities for a wide range of strikes. An increase in the VIX index indicates increased volatility.

[13] See IMF World Economic Outlook Update January 2024.

[14] West Texas Intermediate (WTI) oil prices declined by 17.7 per cent to an average of US$77.62 per barrel for 2023, relative to an increase of 38.8 per cent for 2022.

Figure 3.3 Movement in Bond Yields

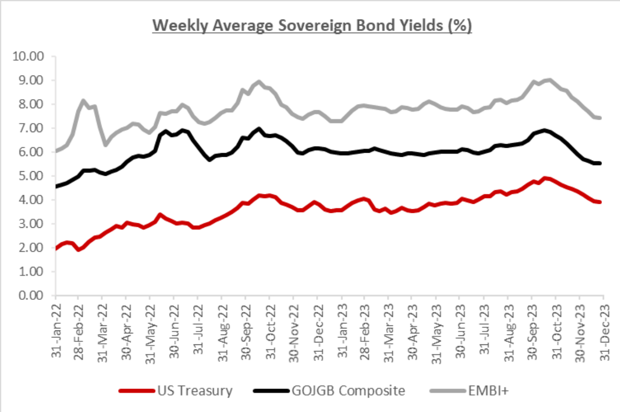
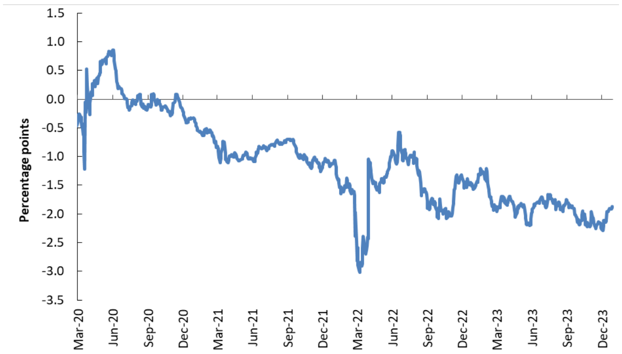
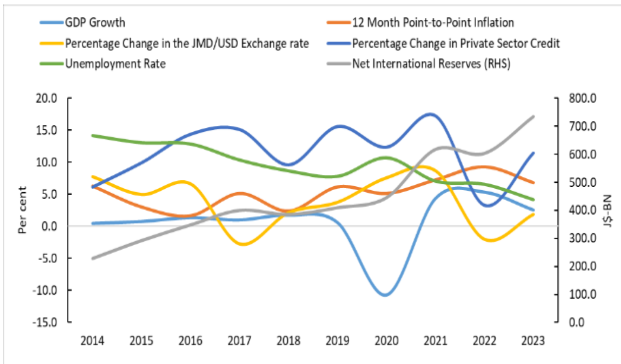


Figure 3.4 Spread between GOJ global bonds and EMBI+



Source: Bloomberg

Figure 3.5 Selected domestic macroeconomic indicators



Notwithstanding the impact of inflation, declines in international commodity prices and shipping costs over the review year, inflation remained elevated relative to central banks target. As such, central banks, globally, maintained a tight monetary policy stance in 2023. In particular, the Federal Reserve Board (FED) increased the Federal Funds rate from 4.25 per cent at the beginning of the year to 5.50 per cent at the end of 2023. Consequently, the average yield on US treasuries and GOJ global bonds increased for the review period (see **Figure 3.3**).The FED also continued the process of contracting the size of its balance sheet by reducing its holdings of *Treasury securities and agency debt* as well as *agency mortgage-backed securities*.

In the context of the moderation in inflation, there was lower volatility in financial markets during 2023, which implied reduced financial stress. This lower volatility in global financial markets was reflected in declines in the Chicago Board Options Exchange Volatility Index (VIX) and The Bank of America Merrill Lynch Global Financial Stress Index (BAML-GFSI) (see **Figure 3.2**).

The spread between GOJ Global Bonds composite yield (GOJGB) and the Emerging Market Bond Index (EMBI+) continued to narrow during 2023 (see **Figure 3.4**) This narrowing reflected a relative improvement in investors' confidence in GOJ global bonds as the Government of Jamaica continued to demonstrate sound economic and fiscal management.

3.3 Domestic environment

Domestic macroeconomic performance also showed mixed results for 2023. In particular, real GDP is estimated to have grown in the range of 1.0 per cent to 3.0 per cent for 2023, relative to growth of 5.2 per cent for 2022. The slowdown largely reflected a normalisation in economic activity following the economy's rebound from the COVID-19 pandemic over the prior two years. This estimated growth largely reflected expansions in *Mining & Quarrying* as well as continued recovery in *Tourism* and its affiliated services which was partly offset by declines in construction, agriculture, forestry and fishing. There was an improvement in labour market conditions, indicated by a decline in the unemployment rate by 2.4 percentage points to 4.2 per cent at October 2023 (see Figure 3.5).

Annual point-to-point inflation declined by 2.5 percentage points to 6.9 per cent at end 2023, relative to end-2022. This deceleration was mainly due to the impact of declines in international commodity prices as well as BOJ's tight monetary policy stance. Notwithstanding this deceleration, domestic inflation continued to breach the upper-end of the Bank's target of 4.0 per cent to 6.0 per cent.

Bank of Jamaica's Monetary Policy Committee maintained its tight monetary policy stance during 2023, in an effort to guide inflation back within the target in the near-term. In this regard, the policy interest rate was held at 7.0 per cent throughout the year.[15] The MPC also continued to manage Jamaican Dollar liquidity, which partly involved increasing the domestic and the foreign currency cash reserve requirements (CRRs) applicable to DTIs by one percentage point to 6.0 per cent and 14.0 per cent, respectively. Additionally, volatility in the foreign exchange market was attenuated by the Bank's continued provision of FX to the system through its FX operations.

Within the context of the maintained policy rate and tightened liquidity, select market interest rates generally increased in 2023. The weighted average lending rate on bank loans to the private sector as at December 2023 was 11.96 per cent, an increase of 56 bps relative to December 2022. Additionally, the weighted average deposit rate was 2.47 per cent as at December 2023, a substantive increase of 85 bps relative to December 2022. The weighted average yields on GOJ 180-day Treasury Bills increased to 8.46 per cent at end-2023 from 8.18 per cent at end-2022. Conversely, there were declines in the daily averages of private money market rates over the year.

There was a narrowing of the GOJ Treasury Bill spread for 2023.[16] The average monthly TRE spread improved to 0.1 per cent in 2023 from 0.6 per cent for 2022. This was due to a notable decline in the private money market rates relative to an increase in the 30-day T-Bill rate (see Figure 3.6). For 2023, the Jamaica Dollar depreciated by 1.9 per cent vis-à-vis the United States dollar, in comparison to an appreciation of 2.0 per cent for 2022 (see Figure 3.5).This relative stability was partly due to buoyant FX supply to the market associated with robust tourism and remittance inflows as well as interventions by the BOJ through its Foreign Exchange Intervention and Trading Tool (B-FXITT) sale operations, direct sales to key entities and FX swap transactions.

3.4 Equity Market Performance

There was weak co-movement between the Jamaica Stock Exchange (JSE) and the Standard & Poor's 500 (S&P 500) Index over the review period (see Figure 3.7). While the S&P 500 index increased by 24.2 per cent during the year, the JSE Main index fell by 8.5 per cent.[17] The performance of the US equity market was influenced by the strong performance of the US economy. For the Jamaican equity market, the performance was negatively affected by the elevated inflation along with continued restrictive monetary policy.

Figure 3.6 TRE Spread

[15] The Policy rate is the rate offered to deposit-taking institutions on overnight placements with BOJ.

[16] The TRE spread measures the premium priced in the repo rate for default risk and is computed as the difference between the 30-day private money market repo rate and the 30-day T-bill rate

[17] The S&P 500 is a market-capitalization-weighted index of the 500 largest publicly traded companies in the USA

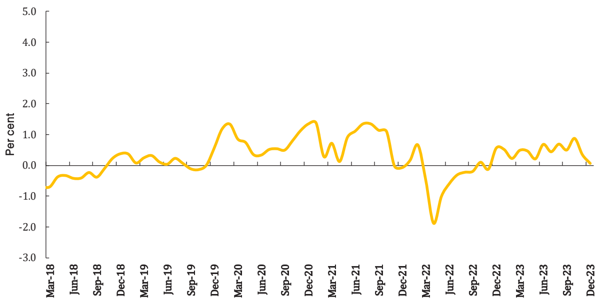
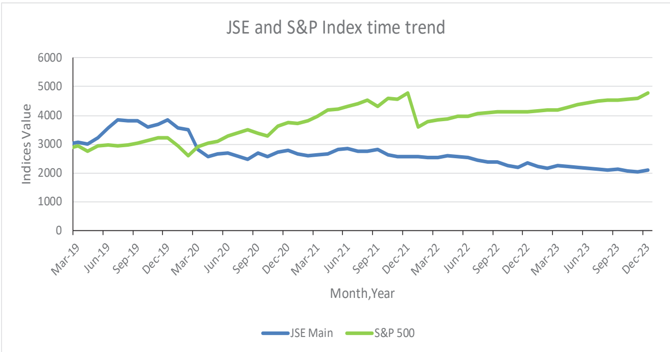


Figure 3.7 Jamaica Stock Exchange (Main) index and S&P 500 index co-movement



4.0 FINANCIAL SYSTEM DEVELOPMENTS

This chapter describes the major developments in sub-sectors within the financial system.

4.1 Overview

Notwithstanding the uncertainties in the macro-environment, the domestic financial sector remained sound during 2023. The sector maintained robust capital positions while asset quality indicators remained favourable during the year. This occurred in the context of accelerated asset growth and continued expansion in deposits. Furthermore, DTIs' liquidity and profitability improved over the review period.

Non-deposit-taking financial institutions (NDTFIs) also recorded accelerated asset growth during 2023. The sector remained adequately capitalized, and experienced an overall improvement in profitability. [1]

For the year ended-September 2023, securities dealers exhibited strong growth in on-balance sheet assets as well as on-and off-balance sheet funds under management. In this context, the ten largest securities dealers maintained capital positions, well above prudential requirements. The sector however experienced an increase in exposure to foreign exchange risks and profitability moderated during the year.

The insurance sectors' asset base expanded over the review period. Meanwhile, the performance in liabilities was generally stable for the year ended-September 2023. In addition, the insurance sector remained sufficiently capitalized, while profitability improved substantially.

The interbank funding network continued to display significant interlinkages between the DTI sector and the NDTFI sector. Additionally, there was an increase in funding transactions among the sectors.

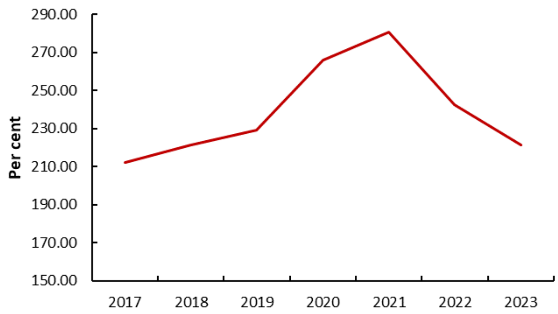
Activity in the JamClear®-RTGS system generally improved for 2023. The value of transactions within the system increased by 0.3 per cent for 2023. Having a robust and reliable RTGS system reduces settlement risk within the payments system. While there was an increase in the number of active ABMs in the system, the number of POS terminals declined for the review year.

[1] NDTFI data was available up to September 2023.

4.2 The financial system

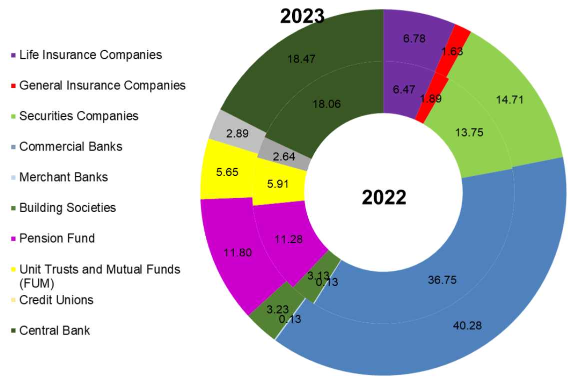
The domestic financial sector remained stable in 2023. (see **Appendix: Table A.1**). Total financial system assets grew by 5.6 per cent in 2023, compared with growth of 2.6 per cent in 2022.[2] Financial intermediation (measured by the ratio of financial institutions' assets to GDP) however declined to 221.4 per cent at end-2023 from 242.7 per cent at end-2022, representing a normalisation to pre-Covid ratios.[3] The increase in the financial system's assets reflected growth of 9.1 per cent and 5.1 per cent in the assets of the DTIs and NDTFIs sector, respectively, relative to 6.6 per cent and 3.1 per cent in 2022 (see **Figure 4.1** and **Figure 4.2**).[4]

Figure 4.1 Jamaica's financial intermediation (assets of financial corporations as % of GDP)



[2] Total Financial Institutions assets includes the assets of commercial banks, building societies, FIA licensees, securities dealers, insurance companies and the Bank of Jamaica.
[3] The financial intermediation measure jumped in the context of the fall in nominal GDP because of the Covid-19 pandemic and begun to normalise in 2022 as GDP recovered.
[4] DTIs include commercial banks, building societies and mutual funds. While NDTFIs include general and life insurance companies, securities dealers, pension funds, unit trusts and mutual funds.

Figure 4.2 Distribution of financial system assets[5]



4.2 Deposit-Taking Institutions (DTI)

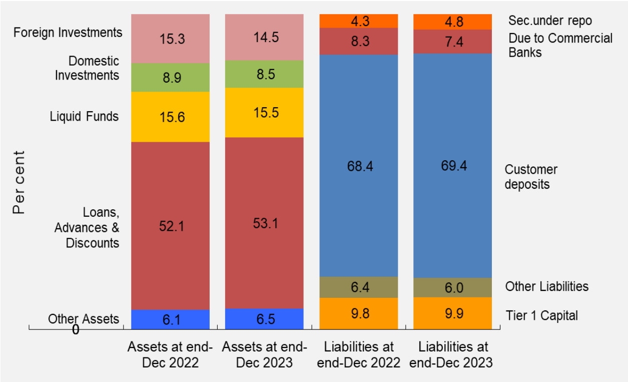
4.2.1 DTI's Balance Sheet

The growth in DTI assets for 2023 was primarily driven by an increase in liquid funds. Loans and investments also grew over the review period. Notwithstanding, DTIs' asset composition remained relatively unchanged during 2023 (see Figure 4.3).

DTIs' holdings of *Liquid Funds* grew by 8.5 per cent to $414.1 billion in 2023, in contrast to a decline of 14.4 per cent for 2022.[6] Investments grew by 3.7 per cent to $613.2 billion at end-2023, relative to end-2022. The growth in Investments primarily reflected an increase of 3.9 per cent to $226.4 billion in *Domestic Investments*, in contrast to the decline of 1.2 per cent for the previous year. Meanwhile, the growth in *Foreign Investments* decelerated significantly to 3.1 per cent to $386.8 billion during 2023, compared to an expansion of 25.6 per cent for 2022.[7]

There was a slowdown in the growth in DTIs' loan portfolio. In particular, *Loans, Advances and Discounts* grew by 11.3 per cent over the review period, compared to a 13.1 per cent expansion the year prior. Domestic currency loans grew by 13.3 per cent for 2023, relative to 15.1 per cent for 2022, while foreign currency loans grew by 1.9 per cent for the year, compared to 4.4 per cent for the previous year.

Figure 4.3 Major components of DTIs' aggregate balance sheet

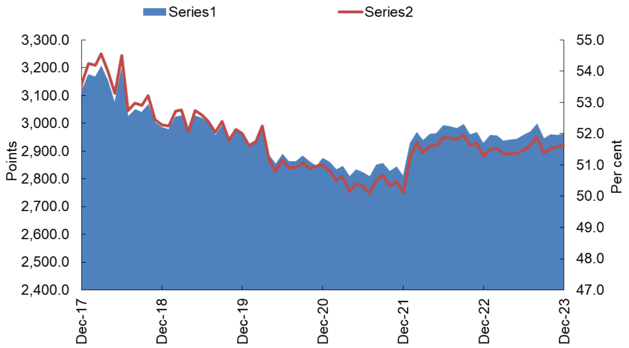


[5] Assets are defined as total balance sheet assets.

[6] The growth in liquid funds primarily reflected an increase in BOJ cash reserves, notes and coins, current account balances, and placements with domestic financial institutions. The impact of these increases was partially offset by a decline in DTIs' holdings at overseas banks. Of note, the increased holdings of cash and bank balances was due to DTIs' conservative lending stance, in the context of the high interest rate environment and heightened expectations of increased credit risk.

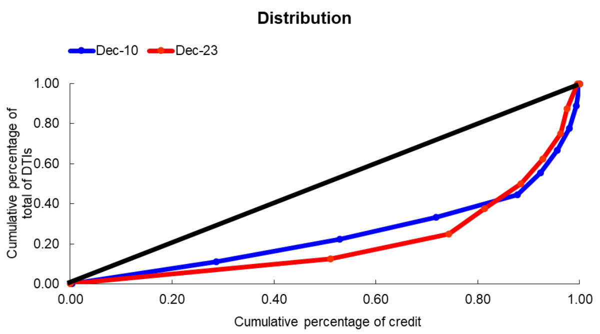
[7] The growth in investments mainly reflected increases in BOJ Certificates of Deposit and sundry investments (in particular foreign government bonds). However, DTIs reduced their holdings of GOJ securities by $11.4 billion in light of lower but continued exposures to unrealized fair value losses on securities, particularly, medium- and long-term GOJ Global Bonds. Of note, unrealized fair value losses for the DTI sector declined by 50.0 per cent to $5.6 billion for 2023, compared to end-2022. The decline in fair value losses reflected a more optimistic outlook on US inflation, amidst prospects that the FED will reduce its policy rate in the medium-term, as well as more favourable GOJ Global Bond market conditions.

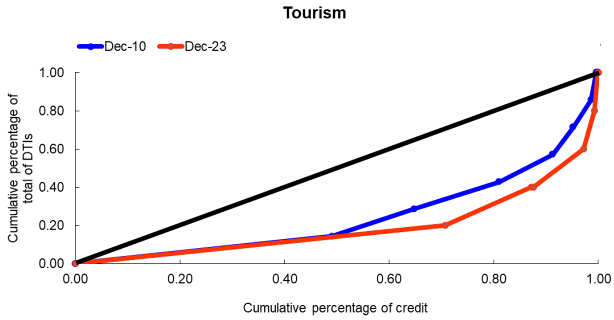
Figure 4.4 Concentration of DTIs' loan portfolio to private sector

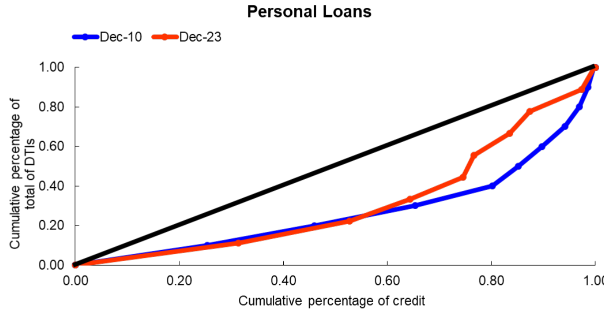


The sectoral concentration of DTIs' private sector credit, as measured by the Herfindahl-Hirschman Index (HHI), increased during 2023 (see Figure 4.4).[8] This performance primarily reflected an increase in loans to the *Professional Services* sector, which experienced the largest growth in credit for the year. Notwithstanding, the *Household* sector (personal loans) remained the largest credit exposure for DTIs.[9]

Figure 4.5 Lorenz curve distribution of credit for DTIs







The share of loans to the private sector continued to be dominated by a few DTIs over the review period. In particular, at end-2023, three of the eleven DTIs provided 62.0 per cent of the total credit to the private sector.[10] DTIs' concentration of exposures to the *Tourism* and *Distribution* sectors increased over the review period. In contrast, there was a decline in concentration exposure to the *Household* sector (see Figure 4.5).[11] Notwithstanding, loans to the *Household, Distribution* and *Loans to Overseas Residents* sectors accounted for the largest share of DTIs' credit, which further supports the results of the HHI.

DTIs' asset quality was relatively unchanged in 2023. The ratio of non-performing loans to total loans was 2.5 per cent at end-2023, similar to

[8] The Herfindahl-Hirschman Index (HHI) is calculated by squaring the loan share of each sub-sector within the private sector loan market and then summing the resulting numbers. The HHI index can range from close to zero to 10 000. Notably, the HHI increased by 1.1 per cent to 2 961.9 at end-2023, relative to end-2022.

[9] "*Household*" is used to represent the "*Personal Loans*" line item which include mortgages to households.

[10] Lorenz curve analysis subsequent to end-2010 is significant given the impact of the global financial crisis and the Jamaica Debt Exchange (JDX) on DTIs' loan portfolio.

[11] The Lorenz curves show the distribution of concentration in DTIs' credit portfolio. The further away the curve is from the line of equality (45-degree line), the greater the level of concentration. For instance, the Lorenz curves for the Distribution and Tourism sectors at end-2023 indicate that there was an expansion in the distribution of credit to these sectors, relative to end-2010. Consequently, an increasing number of DTIs are responsible for credit channelled to these sectors.

what obtained the prior year. Of note, the dollar value of NPLs grew by 10.0 per cent to $35.3 billion for the review period (see **Figure 4.6**). However, this growth was outpaced by the expansion in DTIs' loan portfolio.

Banks remained comfortable in their ability to mitigate their credit risk. The NPL coverage ratio fell marginally to 119.8 per cent at end-2023 from 123.1 per cent at end-2022.[12] This outturn primarily reflected stronger growth in DTI NPLs relative to the increase in provisioning for the review period.[13] Furthermore, the loan loss provisioning rate, as measured by the ratio of loan loss provisions to total loans, decreased marginally to 3.0 per cent at end-2023, from 3.2 per cent at end-2022.[14]

Figure 4.6 NPLs in the DTI sector

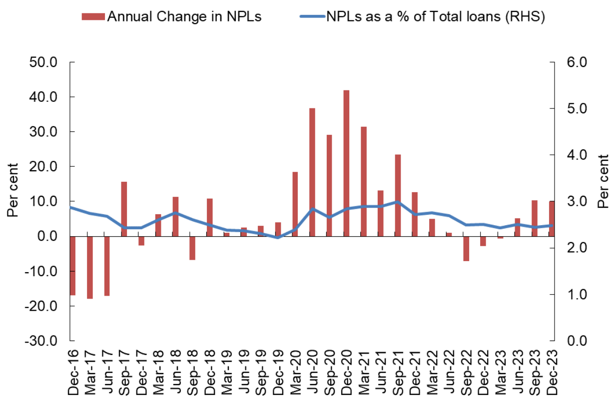
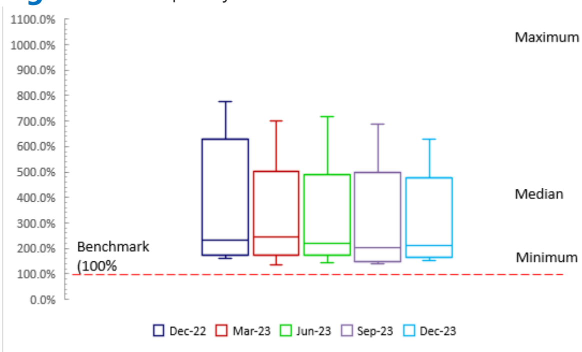


Figure 4.7 Liquidity conditions in the DTI sector



DTIs' liquidity remained adequate during the review year.[15] DTIs' liquidity coverage ratio (LCR) increased marginally by 2.0 percentage points to 190.5 per cent at end-2023, well above the prudential benchmark of 100 per cent. The increase in the LCR reflected stronger growth in DTIs' holdings of high-quality liquid assets (HQLA) relative to the growth in DTIs' projected net cash outflows (see **Figure 4.7**).[16]

For 2023, there was an increase in DTIs' liabilities, with funding from deposits remaining the primary source of asset financing. DTIs' total deposits (including foreign currency deposits) grew by 10.6 per cent to $1 852.0 billion at end-2023, surpassing the increase of 8.0 per cent in the previous year.[17] As a result, the share of deposits to total liabilities increased marginally to 78.8 per cent for 2023, from 78.3 per cent for 2022. Similarly, financial intermediation, measured by the loans to deposit ratio, grew by 0.4 percentage point to 76.7 per cent at end-2023. Against this background, the results

[12] NPL coverage ratio measures a bank's ability to absorb potential losses from its non-performing loans. It is calculated as provisions for impairment under the International Financial Reporting Standards (IFRS) plus prudential provisions for expected losses based on regulatory criteria as a ratio to NPLs.

[13] DTIs' total provisions over the review period grew by 7.1 per cent to $43.3 billion at end-2023, relative to the 10.0 per cent growth in NPLs.

[14] Loan loss provisions represent the net new allowances that DTIs make in the period against bad or impaired loans. This is done based on their judgement as to the likelihood of losses. Under the IFRS, it is calculated as provisions of impairment plus prudential provisions as a percentage of total loans.

[15] Under the Basel III framework, DTIs are required to hold high-quality liquid assets (HQLAs) sufficient to cover more than 100 per cent of their net cash outflows for a 30-day period (NCOFs). HQLAs refer to assets that can be easily liquidated, especially in distress periods. These are assets which can easily be converted to cash through sales or by being pledged as collateral, with no significant loss of value. The LCR is calculated as the ratio of HQLA to NCOFs.

[16] DTIs' HQLA grew by 12.6 per cent to $620.0 billion over the review period, from $549.9 billion at end-2022.

[17] The increase in deposit inflows for the DTI sector occurred in the context of the wage adjustments and restructuring activities in the public and private sectors during the year as well as the impact of the downward trend in inflation.

suggest that DTIs' exposure to liquidity risk was relatively stable over the period.

In light of a reduction in fair value losses, DTIs maintained strong capital positions. The average CAR for DTIs increased by 0.4 percentage point to 23.4 per cent as at end-2023, remaining well above the prudential benchmark of 10.0 per cent, (see **Figure 4.8**). Furthermore, the quality of DTIs' regulatory capital, as measured by the ratio of Tier 1 capital to total regulatory capital, improved to 96.2 per cent for 2023, from 95.3 per cent for 2022. Furthermore, the ratio of Tier 1 capital to risk weighted assets improved by 1.6 percentage points to 15.4 per cent at end-2023, relative to the year prior. Notably, however, the ratio of retained earnings to capital, declined by 2.4 percentage points to 24.5 per cent at end-2023, compared to end-2022.

Figure 4.8 Distribution of capital adequacy ratio

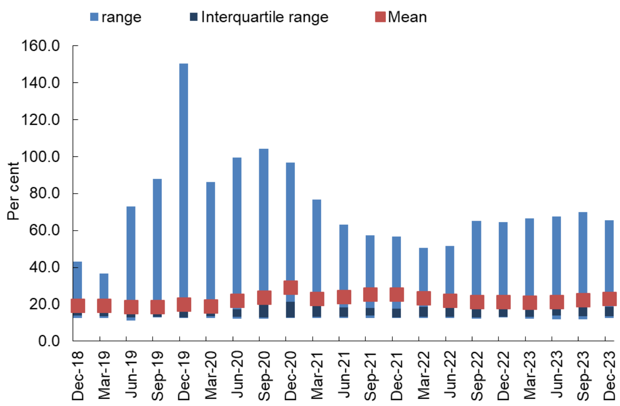


Figure 4.9 Decomposition of DTIs' ROE[18]

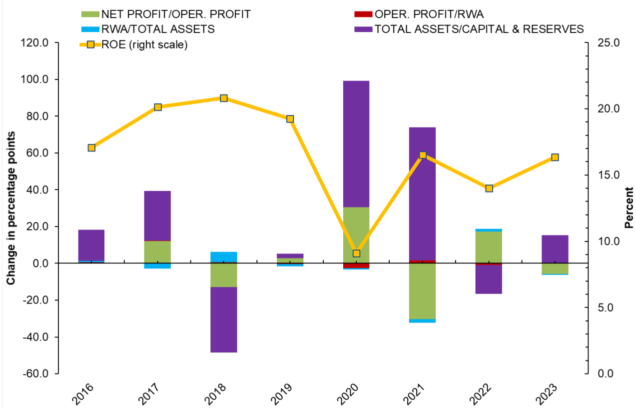


Figure 4.10 Distribution of DTIs' ROA

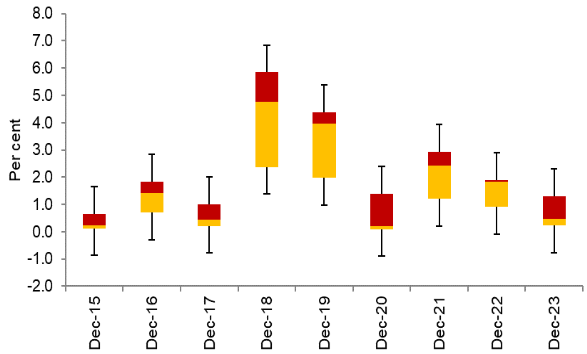
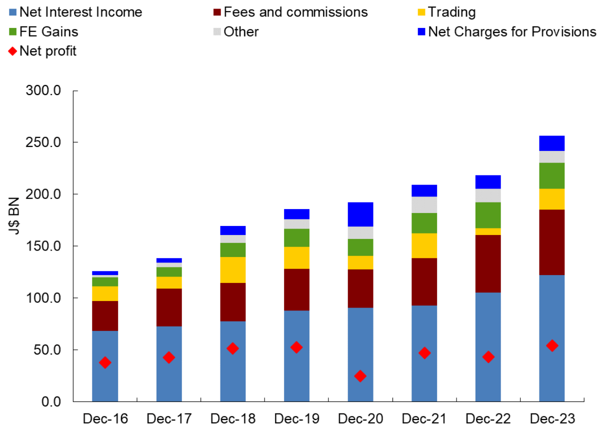


Figure 4.11 DTIs' sources of revenue, total provisions and net profit



[18] The ROE level is presented on the right-hand scale in percentage; the changes of factors (components of ROE) are presented on the left-hand scale.

4.2.2 Deposit-taking institutions' earnings and profitability

Despite higher operating expenses, DTIs' profitability improved over the review period. More specifically, DTIs' net profits grew by 22.2 per cent to $51.7 billion (1.9 per cent of GDP) for 2023, from $45.0 billion (1.7 per cent of GDP) for the previous year.[19] Operating profits also increased by 31.1 per cent for the review period.[20]

There was a moderate improvement in profitability indicators for the DTI sector. The sector's return on equity (ROE) increased to 15.9 per cent in 2023, from 15.0 in the previous year. This outturn largely reflected a significant increase in DTIs' leverage ratio. Moreover, total assets to equity indicated that DTIs' primary means of asset financing over the review period was through the issuing of equity. These results largely reflected stronger growth in DTIs' operating profit, relative to the growth in risk-weighted assets (see **Figure 4.9**).

Similarly, DTIs' return on assets (ROA) increased marginally to 2.0 per cent for 2023, from 1.9 per cent for 2022 (see **Figure 4.10**). The increase in the ROA primarily reflected growth in income from *Trading* and *Other Income* (see **Figure 4.11**).

The growth in profitability occurred in the context of an increase of 26.7 per cent in DTIs' operating income. This improvement was mainly due to a 24.0 per cent growth in interest income, mainly reflecting increases in income from *Loans, Advances and Discounts (19.4%)* as well as *Banks & Other Financial Institutions (147.3%)*. The growth in interest income reflected both the impact of the interest rate environment as well expansions in DTIs' loan portfolio and investment holdings.

Non-interest income grew by 18.5 per cent for 2023 relative to the previous year. This outturn primarily reflected the impact of a rebound in income from *Dividends & Trading Profits on Securities*, which grew by 209.0 per cent ($13.6 billion), in contrast to the contraction of $17.6 billion in 2022.[21]

DTIs' operating expenses increased by 21.6 per cent over the review year. This growth reflected growth in interest expenses of 52.7 per cent. Additionally, DTIs' provisions for loans and security losses increased by 13.6 per cent for 2023, relative to the previous year.

In the context of the above, DTIs' net interest margin increased slightly to 5.9 per cent for the review period, from 5.5 per cent for 2022.[22]

4.4 Non-deposit-taking financial institutions

4.4.1 Market share and balance sheet position

The growth in non-deposit-taking financial institutions (NDTFIs) assets accelerated over the review period. NDTFIs' assets grew by 5.1 per cent to $2 485.0 billion at end-September 2023, relative to growth of 3.5 per cent for the previous year.[23]

Growth in the sector's asset was reflected across all sub-sectors. Life insurance, general insurance and securities dealers' reflected asset growth of 4.7 per cent, 9.6 per cent and 7.0 per cent, respectively. The asset base of the pension funds sector grew by 4.6 per cent for the review period, while the asset base of collective

[19] Net profit is defined as pre-tax profit (loss). Specifically, it is computed as gross operating profit (loss) plus any extraordinary income minus extraordinary expenses, plus or minus any adjustments for the prior period.

[20] Operating profit refers to gross operating profit (loss) and is computed as the difference between gross income and expenses.

[21] This performance was primarily driven by a resumption in dividend flows by some DTIs as well as increased income from fees and commissions in light of improved profitability.

[22] Net interest margin is calculated as the ratio of net interest income to average earning assets.

[23] NDTFIs consist of securities dealers, pension funds, CIS, life insurance and general insurance companies.

investments schemes (CIS) experienced relatively weak growth of 0.6 per cent.[24]

The NDTFI sector continued to be dominated by securities dealers. For the year ended–September 2023, the core securities dealers' share of total assets increased to 36.3 per cent of NDTFIs' total assets, compared to 35.6 per cent at end-September 2022.[25] In contrast, there was a moderate decline in the share of unit trust and mutual funds' assets to total NDTFI assets to 13.9 per cent, from 14.5 per cent. The market share of life insurance and general insurance companies, as well as pension funds, remained relatively unchanged for the review period (see Figure 4.12).

Figure 4.12 Distribution of non-deposit-taking financial institutions' assets[26]

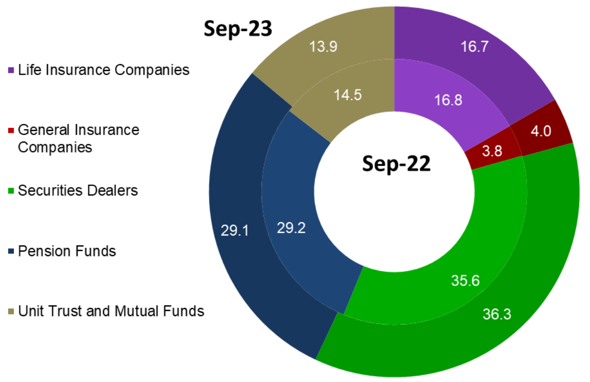


Figure 4.13 Major components of securities dealers' funds under management (FUM) assets

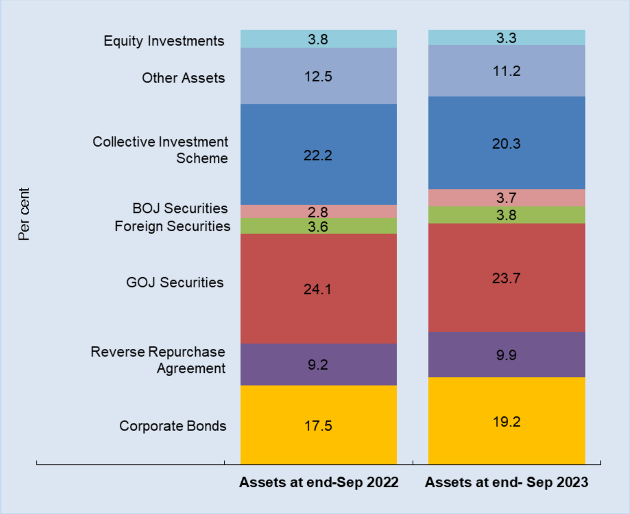


Figure 4.14 Securities dealers' balance sheet capital and select capital adequacy ratios

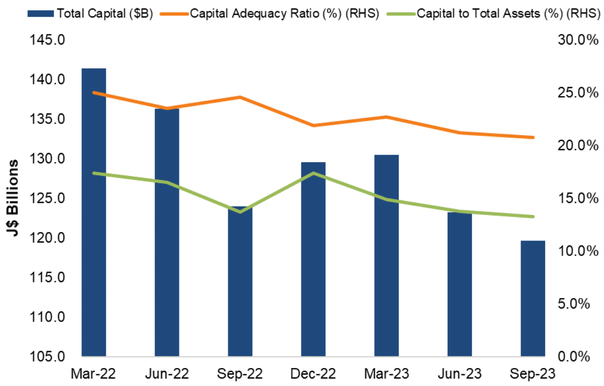
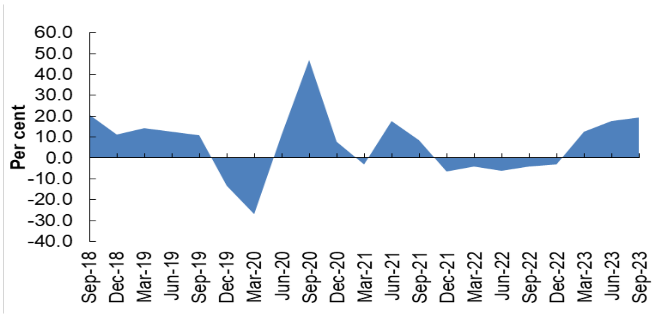


Figure 4.15 Foreign Currency Net Open Position (NOP) to Capital (exposure to foreign exchange risk)



[24] Unit Trust and Mutual Funds are referred to as collective investments schemes (CIS)
[25] Core securities dealers refers to the twenty-nine listed securities dealers and data is available as at end-September 2023.
[26] Assets are defined as total balance sheet assets.

4.4.2 Securities Dealers

Growth in Securities dealers' assets was primarily due to an increase of 7.5 per cent to $741.3 billion in the stock of *Investments*.[27] *Accounts Receivable* also increased by 28.0 per cent to $60.2 billion at end-September 2023, primarily reflecting interest income receivable and other receivables of four of the top five dealers.[28] In contrast, *Loans and Advances*, Other Assets and Liquid Funds declined by 9.5 per cent, 9.0 per cent and 3.6 per cent, respectively, at the end of the review period.

In addition, there was an expansion in core securities dealers' funds under management (FUM) (on- and off-balance sheet) over the review period. FUM increased by 4.2 per cent to $1 448.4 billion at end-September 2023, relative to end-September 2022 (see **Figure 4.13**). This growth primarily reflected increases of $34.5 billion, $20.4 billion, $16.7 billion and $15.2 billion in *Corporate Bonds*, *Commercial Paper*, *Reverse Repurchase Agreements* and *BOJ Securities*, respectively. Of note, on-balance sheet FUM continued to account for the largest share of securities dealers' total balance sheet assets, which recorded a marginal decline of 0.7 per cent to 74.3 per cent at end-September 2023.

Securities dealers maintained strong capital positions at end-September 2023. The CAR for securities dealers decreased by 1.5 per cent to 20.7 per cent, albeit remaining well above the prudential minimum requirement. This fall primarily reflected growth of 7.2 per cent to $635.2 billion in RWA, partly offset by slower growth of 5.6 per cent to $131.8 billion in regulatory capital (see **Figure 4.14**).[29] The growth in regulatory capital was due in part to an increase in retained earnings, which strengthened loss absorbency in the sector, in the context of high risk-premiums due to the elevated interest rate environment

There was a notable shift in securities dealers' foreign exchange holdings for the review period.[30] In particular, the NOP to capital ratio for SDs increased from a short position of 4.0 per cent to a long position of 19.5 per cent at end-September 2023, relative to end-September 2022 (see **Figure 4.15**). This outturn primarily reflected stronger growth in the dollar value of SDs' NOP relative to the growth in capital.

Securities dealers' profitability declined over the review period. SDs' net profits fell by $920 million to $561.1 million for the year ended September 2023 (see **Figure 4.16**). SDs' total revenue increased by 13.7 per cent to $16.1 billion, from $14.2 billion in 2022. The growth in total revenues however, was outpaced by growth in total expenses for the year ended-September 2023 of 21.2 per cent to $15.8 billion.[31,32]

Against this background, profitability indicators for securities dealers moderated for the review period. Securities dealers' ROA was relatively unchanged at 0.4 per cent at end-September 2023 but the ROE decreased by 2.4 percentage points to 2.2 per cent, (see **Figure 4.17**). In addition, leverage, as measured by the total liabilities to total assets ratio, declined marginally to 81.5 per cent as at end-September 2023, from 82.3 per cent at end-September 2022.

[27] The year over year growth in investments was due to growth in public sector securities primarily Bank of Jamaica securities, Government of Jamaica securities, reverse repurchase agreements, and shares of $13.5 billion, $4.7 billion, $12.9 billion and $8.7 billion, respectively.

[28] Interest income receivable reflects investments in interest bearing instruments, while other receivables includes margin loans and management fees.

[29] Capital adequacy ratio is measured as the ratio of regulatory capital to risk-weighted assets.

[30] For the remainder of the chapter, analysis is based on a representative sample of ten securities dealers that comprise 94.4 per cent of the sector, based on data available up to end-September 2023.

[31] The growth in total revenues was primarily driven by growth in interest income of 15.9 per cent ($1 522.6 million). This outturn mainly reflected an increase of $1 154.9 million in *Securities Purchased Under Repo Arrangements* to $1 902.0 million over the review year.

[32] The growth in total expenses was mainly due to a 34.3 per cent increase in interest expenses for the review year ended September 2023. This outturn largely reflected an increase in *Repo Liabilities*, which grew by $2 171.4 billion. at end-2022. *Borrowings* and *Other Client Funds* also grew by $261.3 million and $142.2 million, respectively.

Figure 4.16 Distribution of Securities Dealers' Net Profit

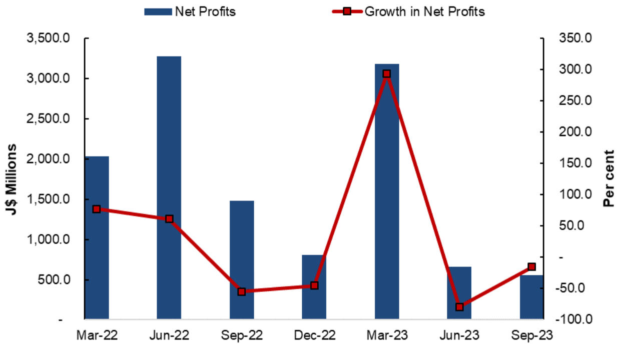
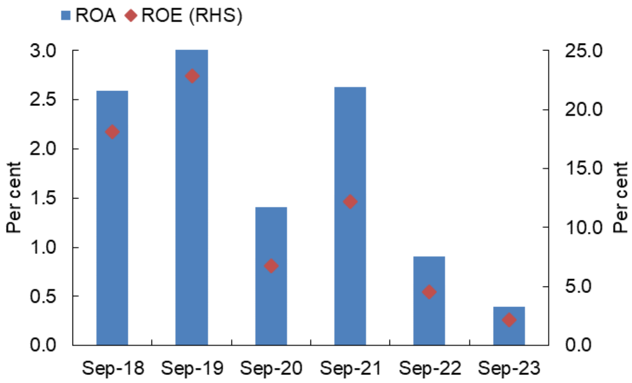


Figure 4.17 Securities Dealers' Return on Asset (ROA) and Return on Equities (ROE)



4.4.3 Insurance companies

Life insurance companies accounted for 80.7 per cent of the insurance sector's total assets at end-September 2023, relative to 81.4 per cent at end-September 2022.[33] Within the life insurance sub-sector, the assets of the two largest companies accounted for 82.1 per cent of the sub-sector's asset base, broadly similar to that which obtained in 2022.

The growth in life insurance assets was mainly due to growth of 10.7 per cent to $78.4 billion in *Other Assets* at end-September 2023, compared to end-September 2022. *Investment Assets,* which accounted for the largest share (81.1 per cent) of life insurance assets, grew by 3.4 per cent to $337.2 billion at end- September 2023 (see Figure 4.18).[34]

As it relates to general insurance companies, the two largest institutions accounted for approximately 38.0 per cent of the sub-sector's asset base, relative to 36.3 per cent at end-September 2022. Growth in the sub-sector's assets reflected growth of 12.3 per cent and 6.9 per cent, respectively, to $51.6 billion and $48.0 billion in *Investment Assets* and *Other Assets* at end-September 2023 (see Figure 4.19).

Total Liabilities for life and general insurance companies remained relatively stable over the review period, increasing by 0.1 per cent to $378.5 billion at end-September 2023. *Insurance Contract Liabilities* accounted for 82.3 per cent and 75.5 per cent of life and general insurance total liabilities, respectively.

For life insurance companies, there was a decline of 2.0 per cent in total liabilities to $312.2 billion at end-September 2023. This was mainly due to a decrease of $6.1 billion in *Other Liabilities (including reinsurance contract held liabilities).* Additionally, *Insurance Contract Liabilities* decreased by $2.0 billion to 256.9 billion at the end of the review period. These declines were partly offset by an increase of $1.9 billion to $39.2 billion at end-September 2023 in *Investment Contract Liabilities* (see Figure 4.20).

In contrast, general insurance companies' liabilities grew by 11.3 per cent to $66.3 billion at end-September 2023. The growth in general insurance liabilities largely reflected an increase of $4.3 billion to $50.0 billion in *Insurance Contract Liabilities* (see Figure 4.21).

[33] The insurance sector data was revised to account for the implementation of IFRS17, which is an International Financial Reporting Standard that took effect on 01 January 2023 to replace IFRS 4 on accounting for insurance contracts.

[34] Will substantiate with feedback from the FSC on composition of investments.

Figure 4.18 Distribution of assets of life insurance companies

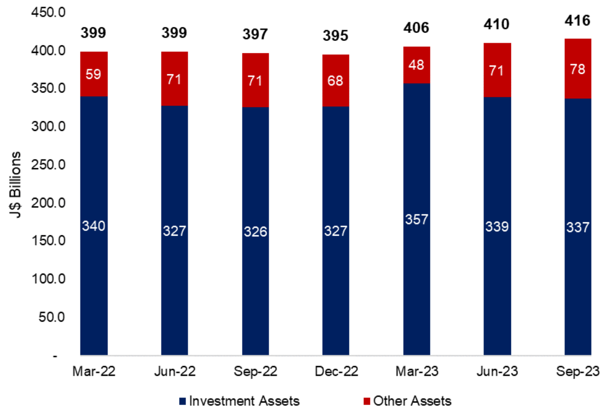


Figure 4.19 Distribution of assets of general insurance companies

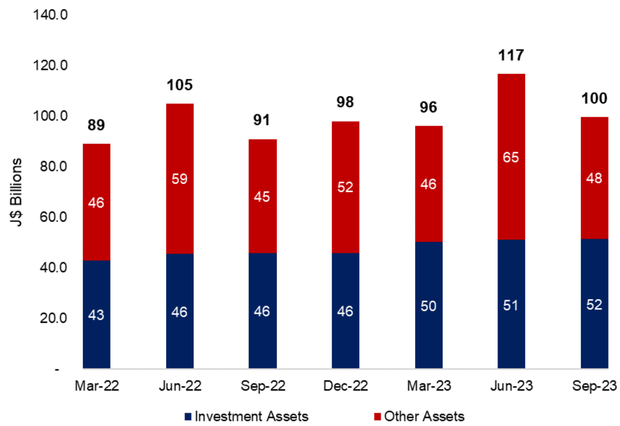


Figure 4.20 Composition of total liabilities of life insurance companies

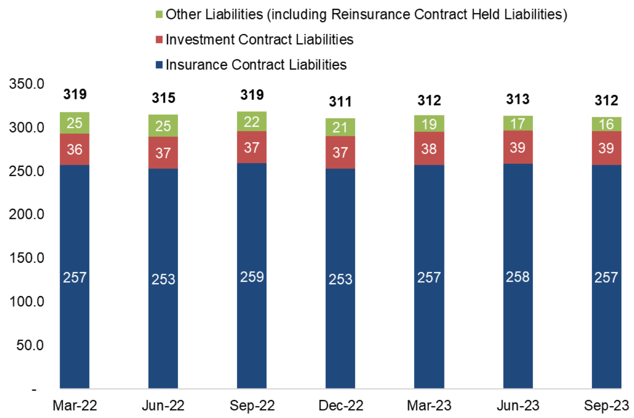


Figure 4.21 Composition of total liabilities of general insurance companies

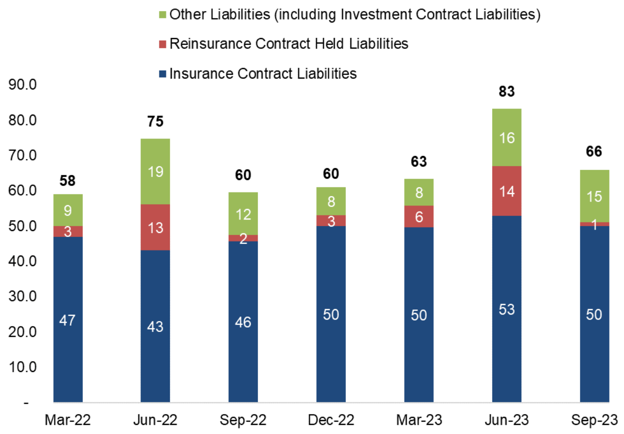


Figure 4.22 Capitalization of the insurance sector

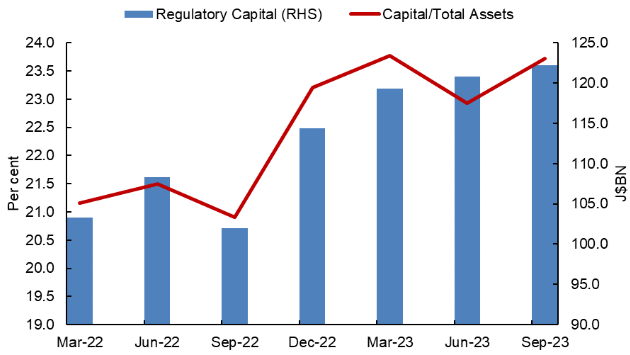


Figure 4.23 Distribution of the solvency ratio of insurance sector[35]

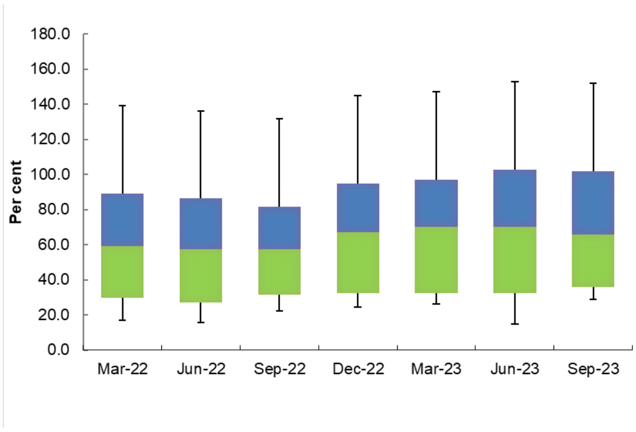


Figure 4.24 Trends in life insurance LICAT ratio

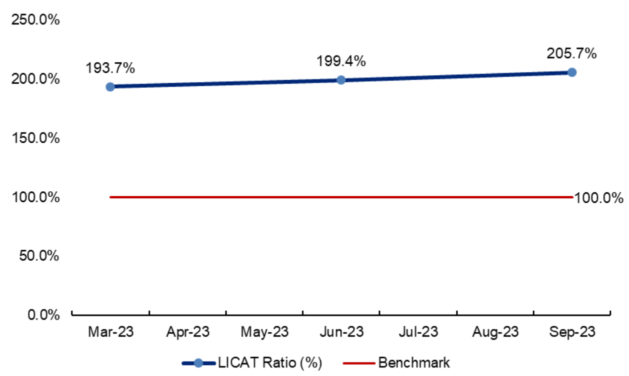
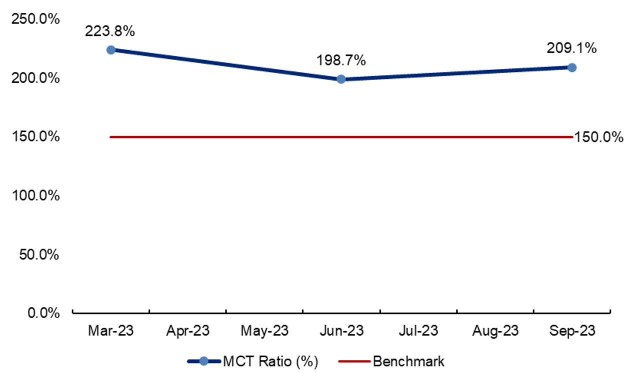


Figure 4.25 Trends in general insurance MCT ratio



[35] The solvency ratio prudential threshold for life and general insurance companies are 10.0 per cent and 25.0 per cent, respectively.

For the review period, the insurance sector remained adequately capitalized and solvent. There was an increase in the ratio of capital to total assets to 23.7 per cent at end- September 2023, from 20.9 per cent at end- September 2022 (see **Figure 4.22**). Total regulatory capital grew by 19.9 per cent to $122.2 billion at end- September 2023, relative to end- September 2022, the effect of which was partly offset by the increase in assets. Additionally, the average solvency ratios for the life and general insurance sectors were 147.9 per cent and 95.6 per cent, respectively, as at end- September 2023 (see **Figure 4.23**).[36]

The life insurance sub-sector recorded a weighted average Life Insurance Capital Adequacy Test (LICAT) ratio of 205.7 per cent, above the minimum requirement prescribed by the Financial Services Commission (FSC) of 100.0 per cent (see **Figure 4.24**).

Similarly, the general insurance sub-sector's Minimum Capital Test (MCT) ratio of 209.1 per cent at end- September 2023, remained well above the prudential benchmark of 150.0 per cent (see **Figure 4.25**).[37]

The insurance sector's profitability increased significantly over the review period. The sector's ROE and ROA increased by 9.3 and 2.4 percentage points, respectively, to 11.3 per cent and 2.9 per cent at ended- September 2023 (see **Figure 4.26**). This reflected growth of 599.5 per cent to $14.7 billion at end- September 2023 in the sector's net income. Accounting for this extra-ordinary performance, net income for the life insurance sub-sector grew by 726.4 per cent for the period ended September 2023.[38] The

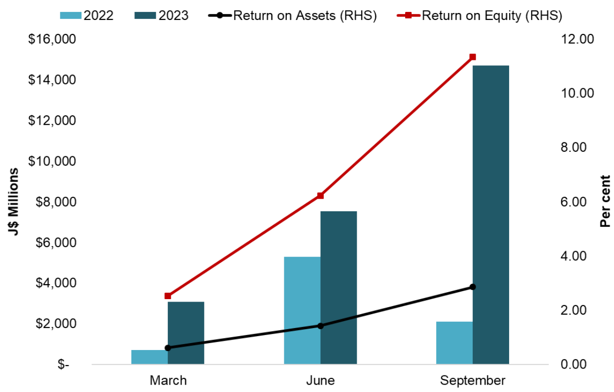
[36] Solvency ratio examines a firm's ability to meet its long-term debts and obligations. It is the summation of capital and surplus, reserves and investments divided by total liabilities.

[37] The MCT Prescribed Capital Required ("PCR") assesses the riskiness of assets and policy liabilities and compares capital available to capital required. The MCT's benchmark was initially at 250.0 per cent in 2019, it was adjusted to 175.0 per cent effective December 2022, and further adjusted to 150.0 per cent in 2023.

[38] The significant increase in net income for the life insurance sector was primarily due to changes in net investment income by one large life insurance company due to adjustments in the fair value on assets.

general insurance sub-sector recorded net income of $1.2 billion over the review period ended September 2023, also representing a strong increase of 152.1 per cent.[39]

Figure 4.26 Distribution of Net income/(loss) and select profitability indicators for insurance sector



4.5 Interlinkages in the Financial System

The interbank funding network continued to display significant interlinkages between the DTI sector and NDTFI sector. The commercial banking and securities dealers' sectors remained the strongest players in the network, as reflected in the number and size of their funding transactions in 2023 (see **Figure 4.27**). At end-September 2023, five commercial banks and three securities dealers remained the most central entities in the interbank funding network (see **Figure 4.28**). Half of the eight most central entities were related to two systemically important financial groups. Notably, there was an increase in participation by life insurance companies in the interbank market at end-September 2023, relative to end-September 2022.

There was an increase in overall funding as well as in the number of reciprocated funding relationships within the interbank funding network at end-September 2023, relative to end-September 2022. In particular, there was a 40.8 per cent increase in funding in the network during 2023, which was mainly attributed to two large transactions by a DTI. Reciprocity, on the other hand, was 59.7 per cent, a 5.0 percentage point increase relative to end-2022.[40]

Notwithstanding the buoyancy in the interbank market, there was a reduction in systemic and concentration risk. More specifically, the systemic risk score (SRS) was 4.7 at end-September 2023, relative to 5.8 at end-September 2022. Based on this outturn, there was decreased risks associated with the interbank funding network. This was due to less concentration of funding transactions in a few key financial institutions. Additionally, the density of the network decreased by 3.5 percentage points to 29.0 per cent at end-September 2023.[41] Of note, although there were improvements for the review period, the concentration of interbank transactions in a few institutions remained a vulnerability to the financial system.

At end-September 2023, conglomerate transactions continued to dominate the interbank funding network. There was also a substantial increase in funding from foreign entities to the domestic banking sector at end-September 2023. This type of funding accounted for 79.0 per cent of the overall interbank funding as at end-September 2023, highlighting the continued reliance of the domestic financial system on foreign entities for funding.

[39] The performance in net profits for general insurance companies largely reflect continued post-Covid 19 pandemic recovery, in addition to improvements in the investment environment related to high interest rates both domestically and globally.

[40] Reciprocity reflects the proportion of bi-directional funding relationships (Entity X both sends and receives funding from Entity Y and vice versa) that exist in the network. The 5-year average of reciprocity in the interbank network was 50.3 per cent.

[41] Density measures the proportion of actual funding relationships in the system against the total number of potential funding relationships in the network.

Figure 4.27 Network of gross credit exposures within the financial system at end-September 2023

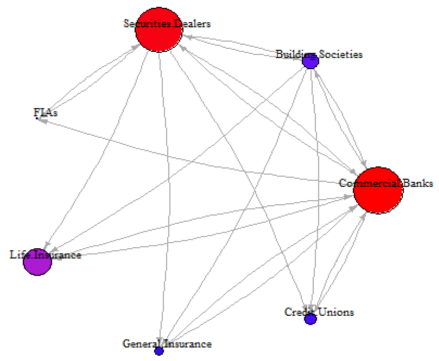
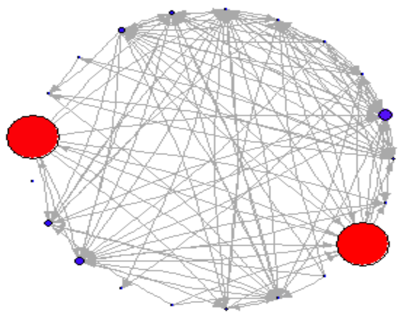


Figure 4.28 Network of gross credit exposures between domestic DTIs and SDs at end-September 2023.



4.6 Payment system developments

4.6.1 Key developments in large value payments[42]

Activity in the JamClear®-RTGS generally improved for 2023.[43] The value of transactions within the system increased by 0.3 per cent to $35.3 trillion for 2023. Concurrently, average monthly transaction values increased by 0.02 per cent to $2.8 trillion (or 13.1 per cent of monthly GDP) for the year.[44,45] While there was an increase in the number of active ABMs within the system, the number of POS terminals declined for the review year.

JamClear®-RTGS transaction volume grew by 14.8 per cent to 3.8 million transactions for 2023. In this context, average monthly transaction volumes increased by 6.0 per cent to 324 698 transactions (see Figure 4.29). Customer credit transfers (single and multiple) were relatively unchanged at 96.2 per cent of total transaction volumes.[46]**For 2023, total transaction values in the JamClear®-CSD system increased by 7.2 per cent to $23.5 trillion, which represented a system**

[42] The JamClear®-RTGS system consists of 23 full members: eight commercial banks, two clearinghouses, one building society, one merchant bank, eight primary dealers (broker dealers), the Jamaica Central Securities Depository (Trustee) and (Limited), Accountant General Department (AGD), Central Bank Digital Currency System and BOJ.

[43] JamClear®-RTGS statistics include both JMD and USD denominated transactions. JamClear-RTGS is also the channel through which the Bank provides intraday liquidity to eligible system participants on a collateralised basis. This provision of intraday liquidity increases the capacity of institutions to settle their transactions in a timely and efficient manner within the business day.

[44] The monthly GDP was derived based on the interpolation of quarterly nominal GDP using the quadratic match sum method.

[45] For the purpose of this report, to better capture RTGS values primarily related to participant activity within the payment system, JamClear®-RTGS transactions exclude general ledger (GL), financial institution debit (FID) and financial institution credit (FIC). GL includes: BOJ initiated messages for Cambio, Issues/Redemption of currency, eGate transactions and Ministry of Finance Payments. FID includes BOJ debit to participants. FIC includes BOJ credit to participants.

[46] Credit transfer refers to a payment transaction by which a credit institution transfers funds to a payee's account on the basis of a payer's order.

turnover of 5.9 times GDP.[47] This greater level of activity was also reflected in an increase in the average monthly value of transactions to $1.9 trillion, representing an average monthly turnover of 300 per cent of monthly GDP. Volumes within the system increased by 14.7 per cent to 3 835 961 transactions for 2023, largely reflecting an increase in market participants use of intraday liquidity.

Figure 4.29 JamClear®-RTGS monthly transaction values and volumes

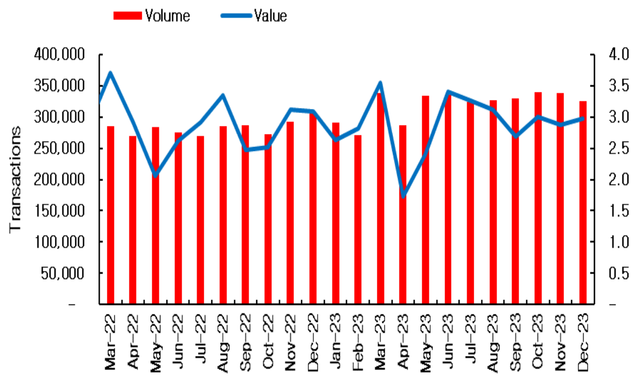


Figure 4.30 Automated Clearing House monthly transaction values and volumes

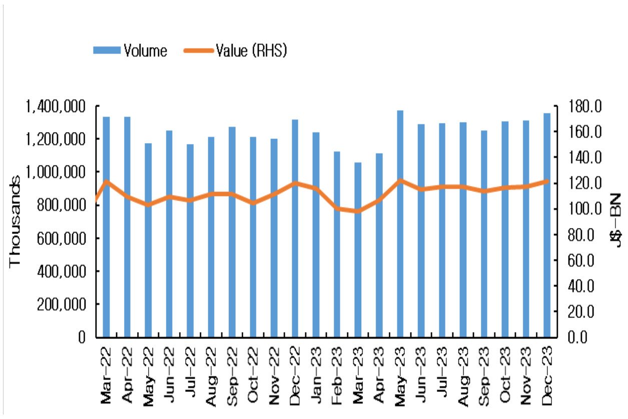


Figure 4.31 Number of active POS and ABM Terminals

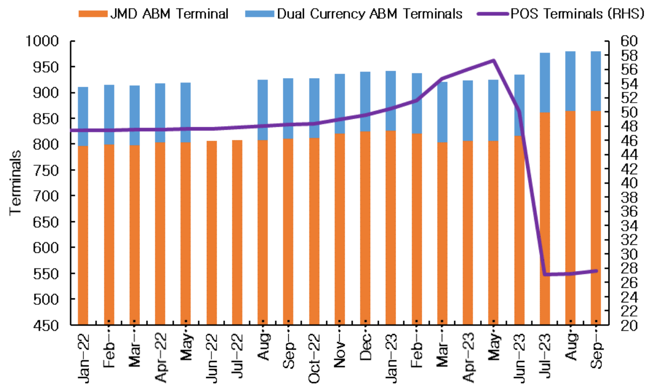
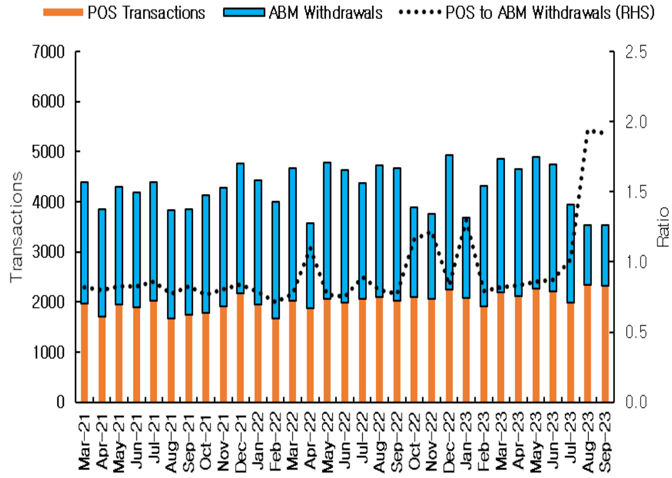


Figure 4.32 POS transactions to ABM withdrawals



4.6.2 Key developments in retail payments[48]

Retail payments activity expanded for 2023.[49] Average monthly transaction values grew to $184 306 per person for 2023, from $178 035 per person for the previous year.

[47] JamClear®-CSD authenticates the ownership of BOJ and GOJ securities. The statistics reflect both JMD and USD denominated transactions.

[48] All retail payments figures, except cash data, are per 1 000 persons of working age (age 15 and older).

[49] Retail payments include cheque payments, debit and credit card payments and other electronic forms of payment. However, the Real Time Gross Settlement (RTGS) system is designed to process large-value and time critical payments and transfers between commercial banks.

Credit cards continued to be the most utilized retail payment instrument and accounted for 58.4 per cent of the total number of retail payment transactions. This was largely driven by a 5.8 per cent increase in credit cards in circulation for the year ended September 2023.

The value of cheques as a percentage of the total value of retail transactions decreased at end-September 2023, relative to end-September 2022. Cheques accounted for 0.4 per cent of transactions over the year to end-September 2023 relative to 1.2 per cent for the same period to end-September 2022. This was driven by the sustained migration to electronic forms of payments from paper-based means of payments. There was an increase of 21.4 per cent in the volume of other electronic payments.[50]

Automated Clearing House (ACH)[51]

Activity within the ACH system marginally increased for 2023. This performance was consistent with BOJ's goal of reducing net settlement risk. Specifically, the total value of transactions processed by the ACH increased by 5.0 per cent to $1.4 trillion for 2023. Additionally, the total volume of ACH transactions increased to 15.0 million for 2023, from 14.7 million for 2022. This outturn primarily reflected increases in direct credit and debit transactions as the number of processed cheques fell by 26.3 per cent for the review period (see Figure 4.30).

Electronic payment channels offered by commercial banks

Commercial banks continued their effort to reduce in-branch transactions during 2023. In this regard, there was an increase in the number of active ABM terminals to 864 at end-September 2023 relative to 824 at end-September 2022. With respect to POS terminals, there was an overall decline in the usage of this electronic channel over the review period (see Figure 4.31). **The ratio of POS transactions to ABM withdrawals increased to 1.9 at end-September 2023 from 0.8 at end-December 2022.**[52] This increase reflected consumers' shift towards electronic payment methods, relative to cash transactions, signalling a preference to go cashless due to ABM disruptions in 2023 (see Figure 4.32).

Figure 4.33 Large-value system concentration risk index

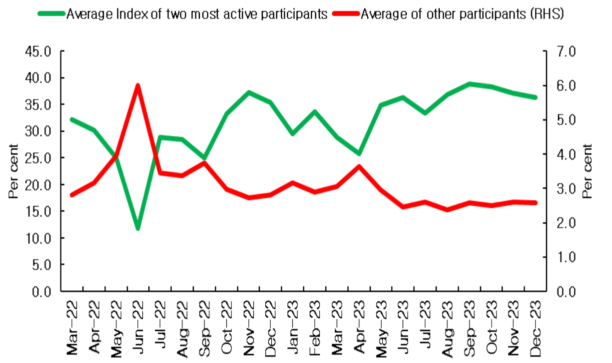
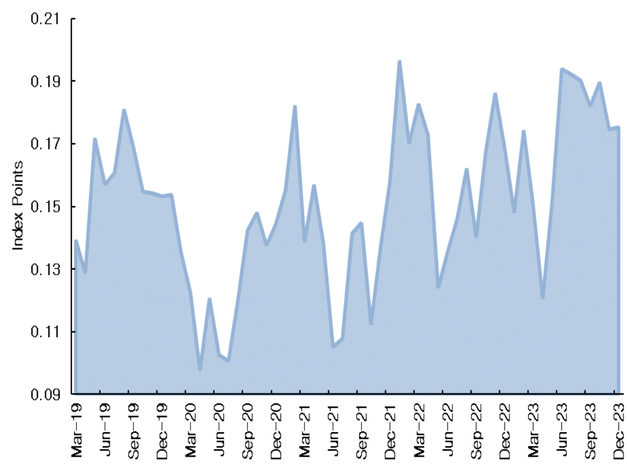


Figure 4.34 Herfindahl index of JamClear-RTGS payment activity



[50] Other electronic payments include any transaction conducted without a card such as online transfers.

[51] The Automated Clearing House is owned by commercial banks. Clearing transactions are undertaken against their accounts and those transactions made on behalf of other payment services providers with indirect access to the ACH. A clearing transaction refers to the process of reconciling and settling financial transactions between different parties.

[52] The data were not available for end-December 2023.

Figure 4.35 BOJ intraday repo facility monthly transaction value

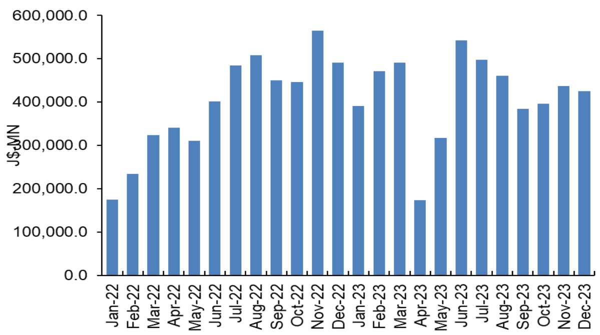
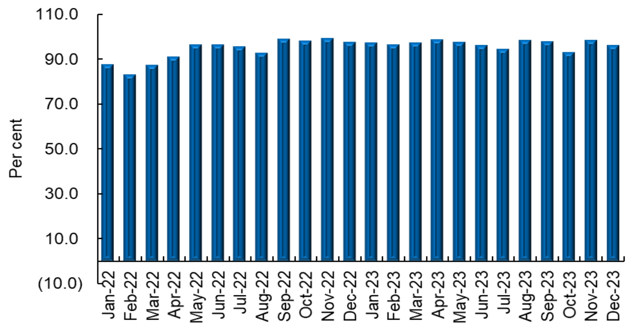


Figure 4.36 Share of BOJ intraday repos (values) demanded by the top four subscribers during 2021 & 2022



4.7 Concentration risk in the Large-value system[53]

The degree of concentration risk, as measured by the large system concentration risk index (LSCRI), increased in 2023 relative to the previous year.[54] Specifically, the two most active participants continued to dominate the share of payment activity, with both accounting for an average monthly share of 36.4 per cent of payment activity for 2023, relative to 35.4 per cent for 2022.[55] Furthermore, the monthly average share of activity for the remaining participants within the system was relatively unchanged at 2.6 per cent at end-2023 (see Figure 4.33).

During 2023, the level of liquidity concentration within the JamClear®-RTGS system, as measured by the HHI, was unchanged relative to the previous year. In particular, the index averaged 0.2 for 2023. This performance reflected the system's moderate levels of concentration (see Figure 4.34).[56] The HHI value and the higher LSCRI indicated heightened systemic risk within the payment system.

4.7.1 Liquidity risk Usage of BOJ's intraday liquidity facility[57]

For the review year, transactions within BOJ's intraday liquidity facility increased (see Figure 4.35). The average monthly and overall value of BOJ's intraday liquidity facility usage increased to $415.6 billion and $4.9 trillion, respectively, for 2023 from $393.9 billion and $4.7 trillion for 2022. The top four institutions utilizing the BOJ intra-day repo facility for the review period, on average, accounted for more than 90.0 per cent of the transactions (see Figure 4.36). The growth in intra-day repo reflected financial institutions' increased usage of the facility in the context of a tightening of monetary policy during the review year.

[53] This measure is computed based on payments made and received by each bank as a share of overall payments for the system.

[54] The LSCRI records the share of payment activity between:

a) the two most active participants in relation to all other participants; and

b) all other participants in relation to the two most active participants.

The calculation excludes the activities of the Accountant General Department, BOJ and Clearing Houses who are also participants in the RTGS system.

[55] High concentration can exacerbate maturity mismatch. Banks may rely heavily on short-term funding sources (e.g., interbank borrowing) to finance long-term assets (e.g., mortgages).
If confidence wanes or liquidity tightens, these banks could face funding difficulties, potentially triggering a crisis.

[56] Values of 0.2 and above indicate that the system is concentrated, while values below suggest that the system is competitive.

[57] The BOJ's intraday liquidity facility provides funds to financial system participants to minimize liquidity exposure brought about by timing mismatches between incoming and outgoing payment activities.

THEMATIC STUDY 1:
Cyber Risk and the Adoption of a Cyber Resilience Framework

Given the highly interconnected nature of financial institutions and market infrastructures, the repercussions of a cyberattack has the potential to extend beyond individual entities to impact entire industries, sectors and the overall economy. As cyberattacks become increasingly prevalent in Jamaica, financial institutions are forced to operate proactively to manage cyber threats. Cyber resilience of the financial sector is of paramount importance given the sector's economic significance and wealth of sensitive data in its possession.

Against this backdrop, in 2023, the Bank achieved noteworthy advancements in crafting a Cyber Resilience Framework. This framework will be pivotal in upholding financial system stability in the face of escalating cyber threats.

Cyber Resilience Framework

The Bank recognised the need for a consolidated set of regulation containing a suite of clear and concise principles as well as specific prudential requirements for the cyber resilience of the sector. Consequently, the Cyber Resilience Framework was approved and comprises:

1. Ten high-level guiding principles for a cyber resilient financial institution and financial sector;
2. Expectations for board oversight on the management of cyber risks;
3. Minimum standards to protect, detect, test, respond and recover from cyberattacks;
4. Assessment tools for cyber resilience;
5. Reporting of cyber incidents; and
6. A platform for cyber information sharing and threat intelligence for the sector.

The *10 Cyber Resilience Principles* are:

Principle 1. Not Just an IT Issue
Principle 2. Legal Basis
Principle 3. Adequate Attention on Agenda
Principle 4. Accountability with Expertise
Principle 5. Transparent, Thorough & Targeted
Principle 6. Defence in Depth
Principle 7. Need-to-know
Principle 8. Least Privilege
Principle 9. Segregation of Duties
Principle 10. Security by Design

Collectively, the different aspects of the framework enable a financial institution to adhere to standards that enhance effective enterprise-wide risk management. This involves implementing adequate measures to safeguard information technology systems, enhancing cybersecurity as well as preparing for business continuity and contingency planning. Additionally, the framework ensures sufficient resilience by bolstering the institution to withstand, anticipate and respond to cyber events.

Cyber Resilience Principles[1]

The *10 Cyber Resilience Principles* for the financial sector of Jamaica are fundamental in creating a cyber resilient culture. They are critical to:

1. Enhance board oversight of cyber risks to assure a cyber resilient financial institution;
2. Strengthen cybersecurity preparedness to withstand cyber threats and recover quickly from cyber incidents, thereby safeguarding financial system stability; and
3. Foster collaboration across the financial sector with public and private stakeholders to ensure that each regulated entity supports the overall resilience of the interconnected whole.

[1] Full publication of the 10 Cyber Resilience Principles is available at: CyberResilience Principles

These high-level principles are aligned with relevant international standards, including principles and guidelines provided by the Bank of International Settlement (BIS), International Organization of Securities Commissions (IOSCO) and the Financial Stability Board (FSB). The Cyber Resilience Principles are applicable to all regulated entities within the financial sector, which includes DTIs and NDTFIs, as well as financial market infrastructures such as clearing and settlement systems operating in Jamaica's National Payment System.

The Financial Policy Committee, on 06 December 2023, approved the adoption of the *10 Cyber Resilience Principles* and the issuance of the *Standard of Sound Practice on the Management of Cyber Risks* for industry consultation. Further guidance notes, assessment tools and information sharing protocols related to the framework are expected to be released during 2024.

Standard of Sound Practice on the Management of Cyber Risks[2]

In December 2023, along with the *10 Cyber Resilience Principles*, the Bank consulted on the *Standard of Sound Practice on the Management of Cyber Risks* which seeks to establish minimum standards and guidelines on the management of cyber risk for licensees under the Banking Services Act, 2014. Under this standard, the prerogative resides with each licensee to operationalize an effective framework for the management of cyber risk exposures inherent in their operations. If these exposures are not properly managed, there could be significant financial loss, legal liabilities and reputational damage for a licensee.

The Standard establishes the crucial role of the board of directors of each licensee in fostering a culture of risk awareness and responsibility throughout the organisation. Through the Board, a licensee's cyber risk management framework extends beyond securing the viability of the institution's technology operations to also cover its people, processes, data and facilities. The Board is expected to have full oversight of the institution's framework for cyber risk management and ensure policies are in place for the establishment of cyber hygiene best practices. This will entail, at a minimum, the incorporation of three lines of defense against cyber risk.

Next Steps

As the Bank remains committed to bolstering cybersecurity measures for the sector, additional guidance on cybersecurity preparedness, cyber incident response and recovery, and information technology operations are slated to be released by the end of September 2024. Additionally, recognizing the importance of collaborative efforts, a cyber intelligence sharing mechanism for the sector is expected by the end of December 2024. This initiative aims to foster a proactive and collective response to cyber threats, thus promoting a secure and resilient financial ecosystem.

[2] Full publication of the Standard of Sound Practice on the Management of Cyber Risk is available at: SSP on the Management of Cyber Risks

THEMATIC STUDY 2:

Building Climate Resilience in Jamaica's Financial Sector

Introduction

In acknowledgment of the notable impact of climate change, Bank of Jamaica initiated a comprehensive effort to manage Jamaica's climate-related financial risks[1]. This endeavour is aimed at strengthening the financial sector against the challenges posed by both physical risks (such as extreme weather events) and transition risks (which arise from the shift to a low-carbon economy). Integrating climate risk considerations into regulatory frameworks and fostering industry preparedness will bolster the Jamaican financial system's resilience amidst a changing climate landscape.

Transmission channels

Transmission channels connect the physical and transition-related risks to the real economy and from there to the financial system. Climate-related risks can create a variety of financial risks:-

1. **Credit Risks:** Reduced borrower repayment capacity due to asset destruction and devaluation from physical hazards and the low-carbon transition;
2. **Market Risks:** Increased volatility stemming from unpredictability in extreme weather events and shifts in investment decisions prompted by transition-related changes;
3. **Operational Risks:** Disruptions to business operations and heightened costs due to climate-related disasters and the adoption of climate-friendly practices;
4. **Liquidity Risks:** Elevated demand for liquidity post-climate events and withdrawals triggered by physical risks to counterparties; and
5. **Legal Risks:** Exposure to legal repercussions from non-compliance with stringent climate regulations and inadequate adaptation measures.

Industry readiness, Surveys and Workshops

BOJ conducted surveys and workshops to gauge the awareness and preparedness of Jamaican financial institutions towards climate risks. All major deposit-taking institutions, securities dealers and insurers participated in the survey.

The survey focused on institutions' knowledge in three areas:

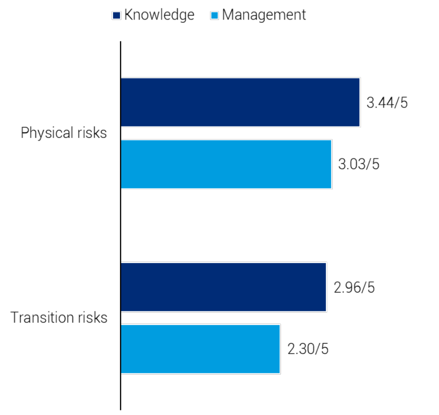
1. Knowledge of CRFRs and reporting frameworks such as the Taskforce on Climate Related Financial Disclosures (TCFD);
2. Current climate-related activities and analysis being undertaken; and
3. Areas where BOJ can support the industry in managing CRFRs.

The results indicated that financial institutions appeared to have more knowledge of physical risks than transition risks (see **Figure 1**). The level of knowledge varied significantly across firms, with the larger institutions typically having more knowledge of different CRFRs and more mature management processes. Differences were not as notable across the various sectors of the financial system.

[1] This work was supported by the JDIC and FSC

Figure 1: Knowledge and action scores for physical and transition risks

1 = little knowledge, 5 = high knowledge

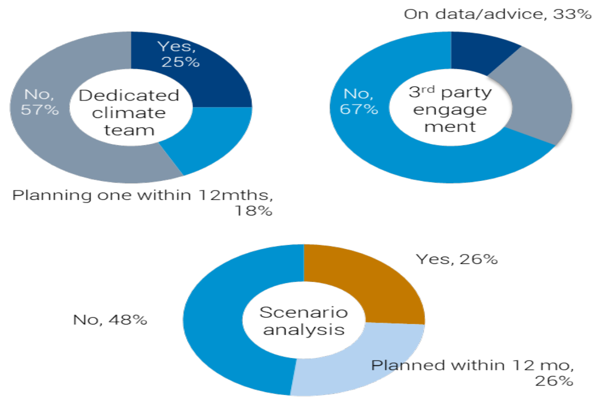


Source: Cambium CGS and BOJ analysis, 2023[2]

Few firms showed high awareness of the TCFD recommendations. Those that had better awareness were typically from international financial groups where the framework has been implemented. This knowledge gap suggests a potential area for future capacity-building in the industry ahead of disclosure requirements.

Beyond the assessment of climate risk knowledge, the survey explored the current level of activity around CRFRs among Jamaican financial institutions. Many institutions were at the beginning of their climate journeys, but a significant number plan to enhance their capabilities over the next 12 months. Notably, a small number of organizations reported having a dedicated climate team or had engaged third parties for climate support. Moreover, around one-quarter of institutions had conducted some form of scenario analysis (usually qualitative), while another quarter plan to do so in the next year, as indicated in **Figure 2** below.

Figure 2: Experiences in climate risk management (1-5)



Source: CGS and BOJ analysis, 2023

BOJ's Commitments

In December 2023, Bank of Jamaica's Financial Policy Committee approved the publication of a climate risks assessment. This assessment included a diagnostic of climate and environmental risks in Jamaica and detailed the current governance and regulatory regime.[3] The report defined the Bank's key climate commitments and outlined a timeline to embed them into supervisory activities. The key commitments include:

1. Enhancing data collection and granularity;
2. Active participation in international climate-related initiatives;
3. Building capacity through education and collaboration;
4. Producing its own TCFD report;
5. Conducting climate stress tests for risk evaluation; and
6. Integrating climate risk into prudential supervision.

These commitments reflect the Bank's dedication to long-term financial stability and sustainable development in the face of climate change.

[2] CGS: Cambium Global Solutions

[3] [Climate-related Financial Risks in Jamaica (exactdn.com)]

THEMATIC STUDY 3:

Trends in Bank Fraud and Related Customer Complaints in Jamaica

During 2023, Bank of Jamaica continued its monitoring of banking fraud, its risks and the implications for financial system stability.[1] In this regard, the review examined the evolution of the DTI sector's exposure to bank fraud, related complaints and resultant corrective actions throughout the period of November 2020 to November 2023.[2],[3]

Methodology

The Bank Fraud assessment utilized routine regulatory reports submitted to BOJ by DTIs pursuant to Section 132(1)(b) of the Banking Services Act (BSA) to ascertain the level of fraudulent activities in the banking system throughout the November 2020 to November 2023 period. The data were collated on a monthly basis and featured key data points such as Fraud Type, Reported Losses, Actual Losses and the Number of Police Reports. Fraud types explored for the period included the following:

1. *Fraudulent Cheque – The unlawful use of cheques to illegally obtain or borrow money (such as counterfeit, forgery, or alteration;*
2. *Credit/Debit Card Fraud – Fraudulent use of a cardholder's account through the theft of the physical card or by compromising the details associated with the account;*
3. *Internal (Occupational) Fraud – Fraud committed by an employee against an organization;*
4. *Internet Banking Fraud – Fraud committed using technology to illegally remove money from an account (e.g. phishing, vishing, smishing);*
5. *Fraudulent Loans – Supplying false information when applying for or receiving a loan; and*
6. *Other Fraud – any other bank related fraud activity not defined above, including fraudulent wire transfers.*

Findings

DTIs reported a general increase in annual bank fraud exposures, as fraudsters have adapted their techniques in response to the enhanced security controls implemented by the industry.

Annual fraud amounts reported ranged from $0.9 billion as at November 2020 to $2.3 billion in 2023 *(see **Figure 1**).* Throughout the review period, DTIs, on average, reported bank fraud amounts of $1.5 billion per annum, accounting for over 34,953 fraud incidences. This reflected an average yearly increase of 33.2 per cent ($0.4 billion per annum). Notably, for the year ended November 2023, growth in fraud amounts were above this average, with an outturn of 50.9 per cent ($0.8 billion). The general increase in fraud amounts was linked to the employment of traditional fraud methods, particularly cheque frauds, and the use of social engineering techniques. [4]

The DTI sector continued to bolster their combative tactics against social engineering techniques by way of the introduction of Europay, Mastercard, Visa (EMV) chip and pin technology post 2018. [5] Furthermore, DTIs implemented multi-factor authentication and expanded the use of push notification features to preserve the more vulnerable banking products: debit and credit cards.

[1] Bank fraud is defined as the use of unlawful means to obtain funds or other property owned by a financial institution or a depositor of a financial institution.
[2] In accordance with Section 91(A)(2) of the Proceeds of Crime Act (POCA), which gives Bank of Jamaica, as a competent authority, the ability to issue directions to commercial banks to take measures for the prevention or detection of money laundering. As such, supervised entities are mandated to establish and implement stringent policies, procedures and controls as an integral part of their fraud prevention and detection strategy. Additionally, under Section 39 of the Banking Services Act, 2014, banks are required to immediately inform Bank of Jamaica of any fraud or criminal activity committed by or against the bank or any member of the financial group.

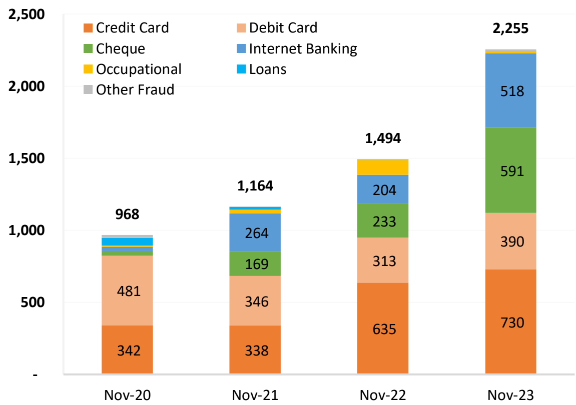
[3] Of note, information conveyed in the Bank Fraud assessment was premised on an overall DTI sector submission rate of 87.9 per cent for the review period. This is reflective of an upward trend in institutional year-over-year compliance rates.

[4] Traditional fraud methods refer to the use of more simple, non-electronic tactics to gain illegitimate access to customer funds, including cheque fraud and card skimming.
[5] EMV chip and pin technology refers to computer chips embedded in credit cards, debit cards or prepaid cards that require a unique numerical code (pin) for each use. Multi-factor authentication refers to an electronic authentication method in which a user is granted access to a website or application only after successfully presenting two or more pieces of evidence, preventing any unauthorized third-party access.
Push notifications refer to automated messages sent by an application to a user to alert him or her of activity relating to the user.

Among fraudulent activities reported over the review period, card fraud remained the most prevalent, accounting for an average of 34.0 per cent ($0.4 billion) of fraud amounts.[6] Although the primary type of fraud reported was card fraud, the overall upward trend in dollar value fraud amounts was due to increases in cheque and internet banking fraud, at 26 per cent and 23 per cent, respectively, of accumulated exposures for 2023 *(see **Figure 1**).*

Notably, Customer complaints received increased to 47 288 in 2023, from to 29 790 in 2022. Fraud complaints for 2023 were predominantly related to fraud events on customer cards.

Figure 1: Stock Composition of Annual Fraud Amounts Reported ($' millions)



Source: BOJ

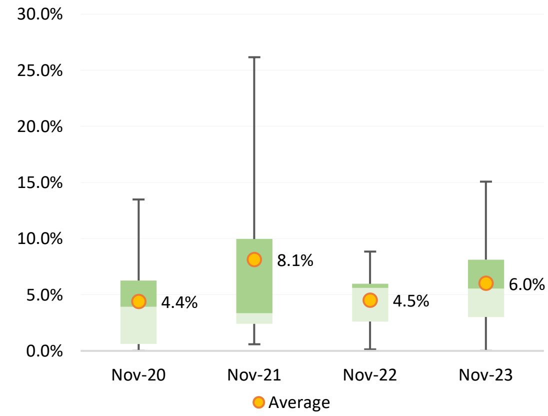
During 2023, fraud claims made by customers totaled $4.0 billion of which 43.0 per cent ($1.7 billion) was refunded to customers by DTIs. This was higher than the previous year's customer refunds of 37.8 per cent. Full refunds were given for occurrences of loan and miscellaneous frauds. In addition, high refund rates continued for cases of internet banking fraud, at 99.4 per cent for 2023. Refund rates were lowest for cheque (25.6 per cent) and debit card (27.4 per cent) frauds.

Additionally, for the 2022 to 2023 period, resolution times for fraud complaints improved to an average 22.9 days against 31.9 days in 2022. Improvement was largely due to shorter turnarounds for cases of credit card fraud.

Despite the prevalence of banking fraud, total fraud amounts accounted for a small portion of institutional pre-tax profits and regulatory capital for most DTIs. Although there was a general increase in dollar value of fraud amounts across the sector, the maximum average impairment to institutional profits for the review period was 8.1 per cent in 2021 *(see **Figure 2**)*. Notably, there was a resurgence in traditional fraud methods in 2023, resulting in an uptick in average impairment to 6.0 per cent in 2023 from 4.3 per cent in 2022.

When represented as a proportion of regulatory capital, average fraud amounts remained consistently below 2.5 per cent of system regulatory capital. On an institutional level, bank fraud amounts throughout the review period ranged between 0.1 per cent and 2.3 per cent of regulatory capital *(see **Figure 3**)*. Given the relatively low ratio of total bank fraud amounts to institutional capital, fraud losses should not have a material impact on DTI's regulatory capital in the near-term.

Figure 2: Distribution of Bank Fraud Amounts to Average Pre-Tax Profits

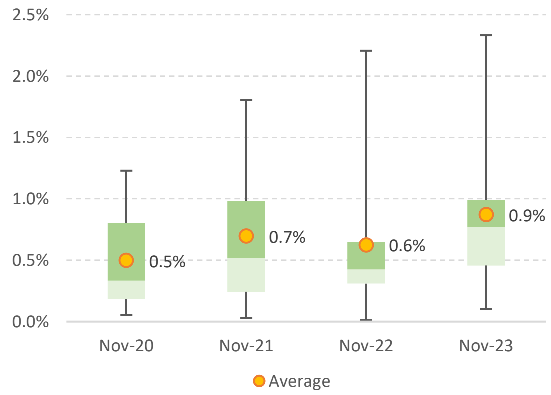


The interquartile range of the ratio across banks ranges from the 25th (Q1) to the 75th percentile (Q3).

Source: BOJ

[6] Card fraud refers to debit card and credit card fraud.

Figure 3: Distribution of Bank Fraud Amounts to Regulatory Capital



The interquartile range of the ratio across banks ranges from the 25th (Q1) to the 75th percentile (Q3).
Source: BOJ

Conclusion

Given the above assessment, DTIs are encouraged to continue to increase public education campaigns. Furthermore, as a result of Jamaica's thrust toward an increasingly digital society, curtailing losses from card fraud and cyber-attacks will become more critical from operational and reputational standpoints. Importantly, Basel III reforms currently being implemented by BOJ are also expected to require deposit-taking institutions to monitor and quantify operational risk and hold sufficient capital at an institutional level to absorb losses from bank fraud, which is supported by the issuance of the consultation paper on the Standard of Sound Practice on the Management of Cyber Risks.

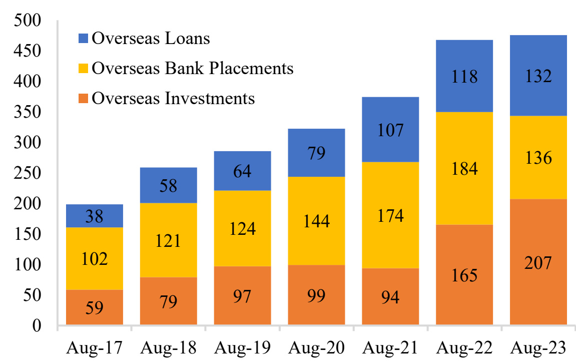
THEMATIC STUDY 4:
Bank Exposures to Overseas Non-Financial Corporates

During the COVID -19 pandemic, deposit-taking institutions increased their exposures to overseas non-financial corporates. Given the potential adverse implications of this development, this Box evaluates the exposure of DTIs to overseas non-financial corporates over the last 7 years.

Total Asset Exposures to Overseas Counterparties

At-end August 2023, DTI assets related to overseas counterparties accounted for 18.4 per cent ($475.3 billion) of total assets. This exposure resulted from average growth of 16.1 per cent in these assets between August 2017 and August 2023. Assets in overseas counterparties were largely comprised of investments (43.6 per cent), bank placements (28.6 per cent) and loans (27.8 per cent) *(see **Figure 1**).*

Figure 1: Stock Composition of Asset Exposures to Overseas Counterparties ($'Bn)



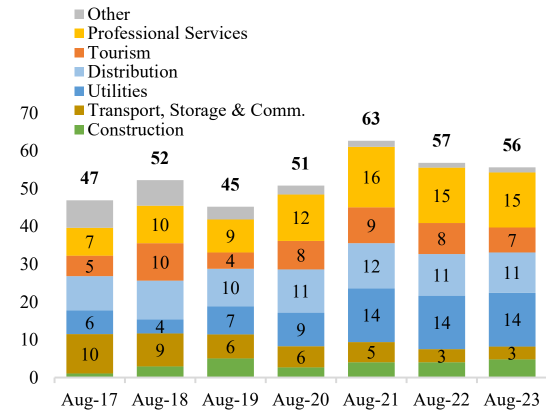
Source: BOJ

Total Asset Exposures to Overseas Non-Financial Corporates

DTI's exposures to overseas non-financial corporates totaled $56.3 billion (11.8 per cent of total overseas exposures), reflecting a 2.1 per cent contraction for the year ended August 2023, relative to end-August 2022.

Overseas non-financial corporate exposures were predominantly in the form of loans and advances, representing 66.1 per cent ($37.0 billion) of these exposures. Lending to overseas non-financial corporates, which was primarily to the Tourism, Utilities, and Professional Services sectors, contracted during 2022 and 2023 following strong growth during the previous two years (*see **Figure 2***). [1]

Figure 2: Sectoral Composition of Overseas Non-Financial Corporate Loans ($'Bn)

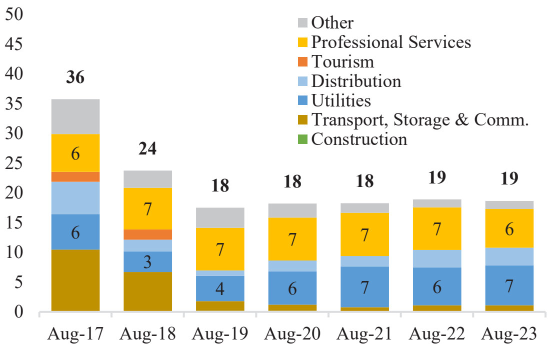


Source: BOJ

Reflecting general stability relative to 2022, investment holdings accounted for 33.9 per cent ($18.6 billion) of exposures to overseas non-financial corporates. Similar to loans, at end August 2023, most overseas non-financial corporate investments were held in the Utilities and Professional Services sectors *(see **Figure 3**).*

[1] Lending to these sectors during 2020 and 2021 was primarily driven by legacy projects, acquisitions, and working capital needs that were in-train prior to the pandemic.

Figure 3: ***Sectoral Composition of Investments in Overseas Non-Financial Corporate ($'Bn)***

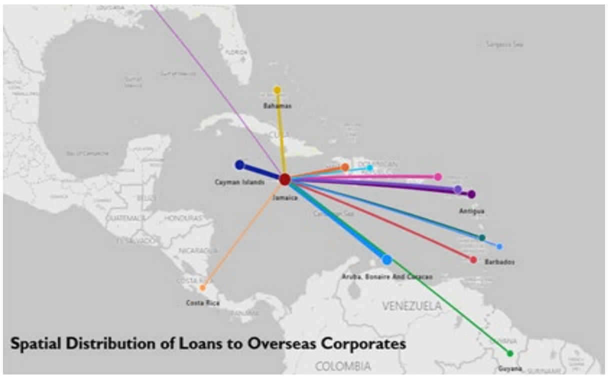


Source: BOJ

Distribution of Overseas Corporate Loans and Investments

Most DTI loans to overseas corporates were disbursed to counterparties incorporated within the Caribbean and Latin America *(see **Figure 4**)*. The majority of these overseas funding were also utilized in countries within the Caribbean and Jamaica. Importantly, most funding facilities were to Jamaican-owned entities incorporated in other Caribbean countries, for the purpose of projects in other jurisdictions.

Figure 4: ***Spatial Distribution of Overseas Non-Financial Corporate Exposures***



Source: BOJ

Note: The magnitude of the lines is reflective of the relative size of the exposures to overseas non-financial corporates.

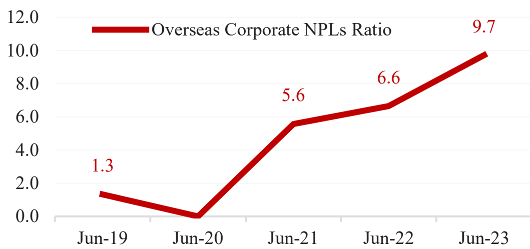
Overseas non-financial corporates investments were primarily in counterparties in the Caribbean. This represented a shift in composition relative to six years prior, when most overseas corporate investments were held in US companies.

Licensees were exposed to jurisdictions in the Caribbean and wider Atlantic basin, which are prone to seasonal natural disasters such as hurricanes[2],[3]. Notwithstanding, overall exposures to territories within the Caribbean were generally low (2.0 per cent of total loans).

Loan Quality of Overseas Non-financial Corporates

Since the onset of the pandemic, DTIs have recorded increased non-performance among overseas non-financial corporate loan facilities, with the ratio of non-performing overseas corporate loans to total overseas corporate loans rising to 9.7 per cent at end June 2023 from 6.6 per cent at end June 2022 *(see **Figure 5**)*. This represented a shift in the composition of overseas delinquencies, which were formerly composed primarily of non-business facilities. Notwithstanding, the steady rise in non-performance among overseas corporate facilities since 2021 was attributed to the effect of foreign exchange revaluations and interest capitalized on facilities that entered non-performing status during 2020.

Figure 5: Trend in NPLs Ratio for Overseas Non-Financial Corporates (Per cent, %)



Source: BOJ

At the end of June 2023, at the institutional level, non-performance amongst overseas corporate facilities was generally moderate to high, with the ratio of non-performing overseas corporate loans to total overseas corporate loans ranging from 4.6 per cent to 12.2 per cent. Improvements in the credit quality of DTI exposures to overseas corporates are anticipated in the near to medium

[2] This includes the Atlantic Ocean, Caribbean Sea and Gulf of Mexico.

[3] Data from the National Hurricane Center and Central Pacific Hurricane Center indicated that, based on a 30-year climate period between 1991 and 2020, the average Atlantic Hurricane season has 14 names storms, 7 hurricanes and 3 major hurricanes (Categories 3, 4 or 5) on the Saffir-Simpson Hurricane Wind Scale which measures wind hazards of an approaching hurricane.

term as recoveries on the majority of these facilities are currently underway.[4]

Conclusion

Overall exposures to overseas corporates were notable for the review period. Most loans and advances to non-financial overseas corporates were extended to companies incorporated in the Caribbean, for utilisation in Jamaica or in the borrower's country of incorporation. Several of these corporates were Jamaican-owned businesses incorporated in other jurisdictions. Non-performance among non-financial overseas corporates remained at generally low levels, with loss recoveries for the majority of these facilities currently underway.

[4] Prudential submissions made to the BOJ by the supervised deposit-taking sector indicate that the necessary legal steps are being pursued to recover losses on these loan facilities.

THEMATIC STUDY 5:
National Financial Inclusion Study 2023

Bank of Jamaica ("the Bank"), through its Financial Inclusion Technical Secretariat ("FITS"), commissioned a survey on financial inclusion in Jamaica. This study was conducted by Hope Caribbean Company Limited and the data were collected during the period 10 February 2023 to 27 March 2023. The main objectives of the study were to provide data on the current knowledge, attitudes, and practices of the general population, as well as small and micro merchants as it relates to financial services including digital payment products.

Survey Methodology

A household based cross-sectional survey was conducted via the use of hand-held computers with the final report delivered on 30 November 2023. The survey parameters included: a national representative sample of 1 003 adults (18+ years); covered all 14 parishes using electoral divisions; urban and rural regions, as well as involved male and female respondents. There was also a survey of 420 micro and small merchants (with 30 selected randomly). The survey had a margin of error of +/- 5% at the 95% confidence level.

The study focused primarily on "access" and "usage", with select quality or perception references and insights as appropriate. "Access", referred to the ability of individuals or enterprises to obtain financial services, while "usage" referred to the actual use of financial products and services, and "quality", referred to the perception of the financial products and the service delivery. Quality indicators were therefore a subjective measure.

Demand-Side – Access and Usage by the General Population

Account Access

Financial Inclusion refers to the accessibility and use, in the formal financial system, of financial products and services that meet the needs of individuals and businesses. The results from the survey indicated that financial inclusion, measured by way of the banked population, varied significantly among socio-economic groups. i.e. upper versus lower income, urban versus rural, and relatively young versus older respondents. Overall, 70.9 per cent of respondents were found to be banked, 6.3 per cent underbanked and 22.8 per cent of the population estimated to be unbanked (i.e. persons not having access nor use of banking products or services). Financial inclusion was found to decline with decreasing socio-economic status. Specifically, upper (95.6 per cent) and middle-income (92.0 per cent) of respondents were significantly more banked versus working class (79.8 per cent) and lower income (59.6 per cent) socio-economic groups. Between 18.5 per cent and 19.9 per cent of urban respondents were unbanked when compared with 29.7 per cent of rural respondents. Additionally, between 31.5 – 32.0 per cent of respondents age 50 years and older were unbanked, when compared with those between 18 and 49 years, being unbanked within a range of between 15.0 - 21.8 per cent.

A total of 63.0 per cent of respondents described the account opening process as "easy to very easy", with 19.0 per cent as "difficult to very difficult". 'Long wait time', 'no character references', 'difficulty accessing a Justice of the Peace ("JP") to sign documents' and 'no proof of address' were among the main difficulties identified in opening an account – these ranged between 10.0 and 35.0 per cent of those who indicated they faced difficulty.

Account Usage

With regard to usage, commercial banks (91.6 per cent) were the dominant financial institutions for account ownership followed by credit unions (17.1 per cent) and building societies (12.5 per cent). Additionally, there was greater transactional usage in the commercial banks relative to building societies and credit unions.

The primary motivators or pull factors for opening an account with a commercial bank was "to save money" (66.5 per cent) and "to receive a wage payment from an employer" (38.4 per cent). Similarly, for building societies they were "to save money" (69.8 per cent) and "to receive a wage payment" (13.5 per cent). The motivations for the use of credit unions were "to save money" (89.4 per cent) and "to process a loan" (14.4 per cent).

Digital Device Ownership, Usage and Internet Access

Access to the internet and smartphone ownership was universal. Respondents indicated 97.2 per cent and 43.8 per cent ownership/usage of a cell phone and computer, respectively, to access the internet. Additionally, the internet was primarily accessed at home (81.2 per cent) and via mobile internet (47.9 per cent).

Of the banked respondents, there was high ownership of digital payment methods, concentrated in those digital payment methods linked to the ownership of a bank account – i.e. debit cards (86.9 per cent) and credit cards (19.4 per cent). The prevalence of other digital payment methods which did not require ownership of a bank account were comparatively lower and included pre-paid cards (5.6 per cent) and mobile wallets (11.8 per cent).

Debit cards (67.0 per cent) were the most commonly owned method of payment for the overall banked and underbanked population. Online banking and the use of online banking to make payments, emerged as the second highest payment method (34.9 per cent), with 42.2 per cent being banked but not online and the remainder being unbanked, thus excluded.

Overall, more than a half (57.1 per cent) of respondents had used at least one digital payment method in at least one instance in the past 12 months. Additionally, 98.5 per cent of upper and 91.1 per cent of middle-income respondents had used at least one method in the past 12 months, which compared with 67.4 per cent of working-class and 40.7 per cent from the lower income demographic.

Respondents were asked to rank specific attributes in terms of their importance when considering using digital payment methods. The most important considerations emerged as the 'security of transactions' (74.0 per cent), followed by 'affordability' (37.0 per cent), 'time-saving quality' (26.0 per cent), 'wide acceptance as a payment method' (22.0 per cent), 'ease of use' (21.0 per cent) and 'ease of resolving complaints' (20.0 per cent).

Cash Acceptance, Preference and Usage

Cash was the most common payment method with 72.0 per cent of respondents reporting using cash every day. The daily cash usage by the lower income demographic at 74.9 per cent was significantly higher than that of the upper income at 46.2 per cent usage. 'Precautionary considerations' (44.0 per cent), 'stores only accepting cash' (39.0 per cent) and 'minimum transaction cost requirements' (30.0 per cent) were among the main pull factors for using cash.

Supply-Side – Acceptance and Preference (Micro and Small Merchants)

All micro and small businesses indicated the acceptance of cash and reflected a combined 78.0 per cent preference for cash. Acceptance of digital payment methods ranged between 5.0 and 34.0 per cent, which was even lower (0.2 – 10.0 per cent) by preference.

Businesses' preference and payment method acceptance profile may create a co-dependency with the public profile and vice-versa. The consumer's ability to use digital payment methods was limited by the penetration of digital payment method acceptance. In that regard, the simultaneous increase in merchant acceptance and preference, alongside people's greater adoption and usage of digital payment methods; will serve to support the expanded preference and usage of digital payment methods by the general population.

THEMATIC STUDY 6:

Promoting Public Awareness and Education about the Deposit Insurance Scheme

Deposit insurance is a system established to protect depositors against the loss of their insured deposits in the event a Bank is unable to meet its obligations to the depositors[1]. The deposit insurance system/scheme (DIS) is therefore a critical part of a country's financial system safety net[2], contributing to the promotion and maintenance of financial system stability. An effective DIS is buttressed by a compelling and successful public awareness and education programme that highlights the existence of deposit insurance and how it works.

Jamaica's Deposit Insurance Scheme

The Jamaica Deposit Insurance Corporation (JDIC) was established in 1998 under the Deposit Insurance Act, following the failure of Jamaica's financial system in the 1990s. The JDIC's mandate was to establish the Deposit Insurance Scheme and to manage a Deposit Insurance Fund (DIF) to provide protection to depositors against loss of their money or part thereof, up to a specified limit, presently J$1,200,000[3], to every eligible depositor of a licensed deposit-taking institution (DTI) namely, commercial banks, building societies and merchant banks (JDIC Member Institutions). This coverage limit is applicable per depositor, per ownership category, per deposit taking institution. At the current coverage limit, JDIC fully covers 96.8 per cent[4] of the total number of insurable deposit accounts in the banking system. This finding is based on data collected from all DTIs as at December 31, 2022[5].

How Jamaica's Deposit Insurance Scheme Works

A key element of the DIS is the JDIC's management of the DIF, which provides a solid financial foundation to meet its obligations and protect depositors in keeping with its public policy objectives. All DTIs are mandated members of the DIS and contribute to the DIF through the payment of annual deposit insurance premiums, collected on an ex-ante basis.

The JDIC is statutorily obligated to provide depositors with prompt access to their insured deposits, in the event the Supervisor of Banks/ Bank of Jamaica has determined that a DTI is no longer viable (has failed) and its licence is revoked. In this case, access to depositors' funds is automatic and payment to depositors will be made based on the records of the failed DTI and the DIS coverage rules. Depositors do not need to submit a claim to the JDIC. Regardless of the decided restructuring/resolution transaction to deal with the non-viable DTI, the JDIC assures all depositors payment of their insured deposits up to the coverage limit of J$1.2 million.

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[1] *IADI Core Principles for Effective Deposit Insurance Systems.*

[2] *Jamaica's Financial System Safety Net (FSSN) comprises of the Ministry of Finance and the Public Service, the Bank of Jamaica, the Financial Services Commission and the Jamaica Deposit Insurance Corporation*

[3] *The coverage limit was increased from $600,000 to $1,200,000 in August 2020.*

[4] *The International Association of Deposit Insurers (IADI) recommends that that an effective DIS should fully protect upwards of 90 – 95 per cent of the number of total depositors.*

[5] *At the time of this report, December 2023 data was not available.*

Commitment to Promoting Public Awareness and Education about the Deposit Insurance Scheme

A fundamental aspect of the effective management of the DIS, and how it impacts confidence and stability in the financial system is the public's awareness and knowledge of deposit insurance — its existence and how it works. Against this background the JDIC ensures the public remains informed about the benefits of the DIS and the protection it provides particularly to small depositors.

Public Awareness and Education Initiatives

A study undertaken in 2023 by the International Association of Deposit Insurance (IADI) - "*Who Will Run a Bank*?", identified public awareness of deposit insurance as one of the mitigating factors to bank run risk. Empirical evidence shared by IADI suggests a 67 per cent decrease in the tendency of depositors to run on their banks when informed about deposit insurance.

JDIC's public education programmes align with international best practices and are continuously reviewed and delivered, targeting both the banked and unbanked. [6] Details regarding the characteristics of the deposit insurance system are continuously publicized to maintain and strengthen public confidence. The Corporation employs the use of various communication channels to ensure that its messages are effectively conveyed and understood by depositors and the general public. Its public education and awareness thrust encompasses electronic, print and digital advertising coupled with the use of public forums and presentations and other collaborative efforts with key stakeholders.

The JDIC positions itself to ensure that public knowledge of deposit insurance and its benefits remain high; and that as purveyors of public trust, the Corporation's mandate is understood. In the event of a bank failure, JDIC's ongoing public education programme will ensure the dissemination of crucial information about depositors' access to insured deposits.

- **Embracing Digital Media to Promote Public Awareness and Education Initiatives**

To increase the public's awareness of deposit insurance and how it can protect their money in the event of a bank's failure requires striking a balance between the use of traditional and digital media, thus ensuring a comprehensive reach.

The JDIC acknowledges the impact of digital revolution and the resulting proliferation of digital media channels, which has created a shift in the media landscape from more traditional forms of communication to digitization of content to meet the change in consumer behaviour. With this knowledge, the Corporation continues to leverage digital media platforms to bolster the reach of its messaging with the aim of increasing engagement among target groups whose use of traditional channels has decreased.

The JDIC's public awareness and education activities support the joint FSSN partners initiatives in keeping with the *National Financial Inclusion Strategy*, fostering financial inclusion for all. These initiatives are aimed at instilling confidence in the public and educating financial consumers about the benefits of the regulatory regime as well as the protection deposit insurance offers to depositors and the financial system.

[6] *IADI Enhanced Guidance for Effective Deposit Insurance Systems – Public Awareness of Deposit Insurance Systems Guidance Paper and IADI Core Principles for Effective Deposit Insurance Systems*

GLOSSARY

Automated Clearing House	A facility that computes the payment obligations of participants, vis-à-vis each other based on payment messages transferred over an electronic system.
Bid-ask Spread	The difference between the highest price that a buyer is willing to pay for an asset and the lowest price that a seller is willing to accept to sell it.
Central Securities Depository	An institution which provides the service of holding securities and facilitating the processing of securities transactions in a book entry (electronic) form.
Concentration Risk	The risk associated with the possibility that any single exposure produces losses large enough to adversely affect an institution's ability to carry out its core operations.
Consumer Confidence Index	An indicator of consumers' sentiments regarding their current situation and expectations of the future.
Counter-party Risk	The risk to each party of a contract that the counterparty will not live up to its contractual obligations. Counterparty risk is a risk to both parties and should be considered when evaluating a contract.
Credit Risk	The risk that a counterparty will be unable to settle payment of all obligations when due or in the future.
Disposable Income	The remaining income after taxes has been paid which is available for spending and saving.
Dollarization	The official or unofficial use of another country's currency as legal tender for conducting transactions.
Financial Intermediation	The process of channeling funds between lenders and borrowers. Financial institutions, by transforming short-term deposits or savings into long-term lending or investments engage in the process of financial intermediation.
Fiscal Deficit	The excess of government expenditure over revenue for a given period of time.

Foreign Exchange Risk	The risk of potential losses which arise from adverse movements in the exchange rate incurred by an institution holding foreign currency-denominated instruments.
Funds Under Management/ Managed Funds	The management of various forms of client investments by a financial institution.
Hedging	Strategy designed to reduce investment risk or financial risk. For example, taking positions that offset each other in case of market price movements.
Interest Margin	The dollar amount of interest earned on assets (interest income) minus the dollar amount of interest paid on liabilities (interest expense), expressed as a per cent of total assets.
Interest Rate Risk	The risk associated with potential losses incurred on various financial instruments due to interest rate movements.
Intraday Liquidity	Credit extended to a payment system participant that is to be repaid within the same day.
Large Value Transfer System	A payment system designated for the transfer of large value and time-critical funds.
Liquidity Risk	The risk that a counterparty will be unable to settle payment of all obligations when due.
Net Open Position	The difference between long positions and short positions in various financial instruments.
Non-Performing Loans	Loans whose payments of interest and principal are past due by 90 days or more.
Off-Balance Sheet Items	Contingent assets and debts that are not recorded on the balance sheet of a company. They are usually noteworthy as these items could significantly affect profitability if realized.
Payment System	A payment system consist of the mechanisms – including payment instruments, institutions, procedures and technologies – used to communicate information from payer to payee to settle payment obligations.
Real-Time Gross Settlement System	A gross settlement system in which payment transfers are settled continuously on a transaction-by-transaction basis at the time they are received (that is, in real-time).

Repurchase Agreement (Repo)	A contract between a seller and a buyer whereby the seller agrees to repurchase securities sold at an agreed price and at a stated time. Repos are used as a vehicle for money market investments as well as a monetary policy instrument of BOJ.
Retail Payment System	An interbank payment system designated for small value payments including cheques, direct debits, credit transfers, ABM and POS transactions.
Stress Test	A quantitative test to determine the loss exposure of an institution using assumptions of abnormal but plausible shocks to market conditions.
Systemic Risk	The risk of insolvency of a participant or a group of participants in a system due to spillover effects from the failure of another participant to honour its payment obligations in a timely fashion.

APPENDIX

Table A.1 Quarterly Financial Soundness Indicators for DTIs

Indicator (%)	Categories	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23
Core Indicators										
Regulatory capital to risk-weighted assets	Capital adequacy	14.2	14.3	14.1	13.8	14.3	14.2	14.9	14.5	14.5
Tier 1 capital to risk-weighted assets	Capital adequacy	13.4	13.3	13.3	13.0	13.6	13.5	14.3	14.0	13.9
Non-performing loans (net) to capital	Capital adequacy	-1.0	-1.7	-2.6	-3.2	-3.2	-3.3	-3.0	-2.9	-2.7
Non-performing loans to total loans	Assets quality	2.9	2.8	2.7	2.5	2.5	2.4	2.5	2.5	2.5
Return on assets	Earnings & Profitability	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.6	0.7
Return on equity	Earnings & Profitability	2.5	3.4	4.5	3.8	3.5	3.5	2.9	4.7	5.7
Interest margin to income	Earnings & Profitability	44.7	44.8	37.0	36.5	38.2	37.9	37.6	33.9	33.4
Non-interest expenses to income	Earnings & Profitability	23.4	22.5	17.6	17.2	17.9	18.0	17.1	16.0	14.7
Liquid assets to total assets	Liquidity	21.9	23.3	24.0	22.4	21.4	20.7	24.1	21.6	21.1
NOP to capital	Sensitivity to Market Risk	-15.5	-19.2	-13.1	-8.0	-10.0	-9.2	-5.3	-8.0	-9.6
Encouraged Indicators										
Capital to assets	Capital adequacy	12.4	12.2	12.2	11.8	12.6	12.5	12.3	12.2	12.4
Trading income to total income	Earnings & Profitability	13.9	12.7	11.9	12.4	9.4	9.2	9.3	14.0	19.4
Personnel expenses to non-interest expenses	Earnings & Profitability	29.1	30.5	29.9	29.2	28.9	30.0	28.2	28.2	27.9
Spread between lending & deposits rates [1/]	Earnings & Profitability	4.2	4.1	3.9	3.6	3.5	2.9	3.0	3.0	2.9
Deposits to total (non-interbank) loans	Liquidity	137.1	136.3	136.9	133.0	131.3	131.8	132.6	131.7	130.6
Foreign-currency-denominated loans to total loans	Foreign Exchange risk	20.6	19.7	18.9	18.3	19.1	18.5	18.2	17.8	17.5
Foreign-currency-denominated liabilities to total liabilities	Foreign Exchange risk	38.3	39.4	38.7	40.1	39.7	39.4	38.4	37.3	36.8
Household debt to GDP	Household sector leverage	26.2	25.8	25.4	25.3	25.0	24.5	24.1	24.3	24.3

Notes:

[1/] Weighted by assets size

Table A.2 Quarterly Financial Soundness Indicators for SDs

Indicator (%)	Categories	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23
A. Securities Dealers [1/]										
Regulatory capital to risk-weighted assets	Capital adequacy	23.3	23.0	23.0	23.0	20.8	22.9	22.0	21.2	20.5
Tier 1 capital to risk-weighted assets	Capital adequacy	17.9	19.1	21.2	21.3	20.5	21.7	21.5	20.4	20.3
Non-performing loans (net) to capital	Capital adequacy	0.7	0.5	0.7	0.9	0.9	0.7	0.7	0.7	0.3
Non-performing loans to total loans	Assets quality	1.4	0.8	0.6	0.9	0.7	0.7	0.9	1.0	0.0
Return on assets	Earnings & Profitability	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.0
Return on equity	Earnings & Profitability	0.0	0.0	0.0	0.0	1.1	1.1	1.6	1.6	0.3
Interest margin to income	Earnings & Profitability	21.2	19.1	21.7	11.3	14.5	11.5	10.1	4.8	6.3
Non-interest expenses to income	Earnings & Profitability	0.7	0.8	0.8	0.7	0.9	1.0	1.6	1.9	0.1
Liquid assets to total assets	Liquidity	15.3	13.4	13.1	13.1	13.5	13.2	13.4	13.2	14.2
NOP to capital	Sensitivity to Market Risk	8.5	-6.4	-4.0	-6.0	-4.0	-3.1	12.4	17.3	20.7

Notes:

[1/] Includes the twelve securities dealers that makes up 70.0 per cent of the market

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