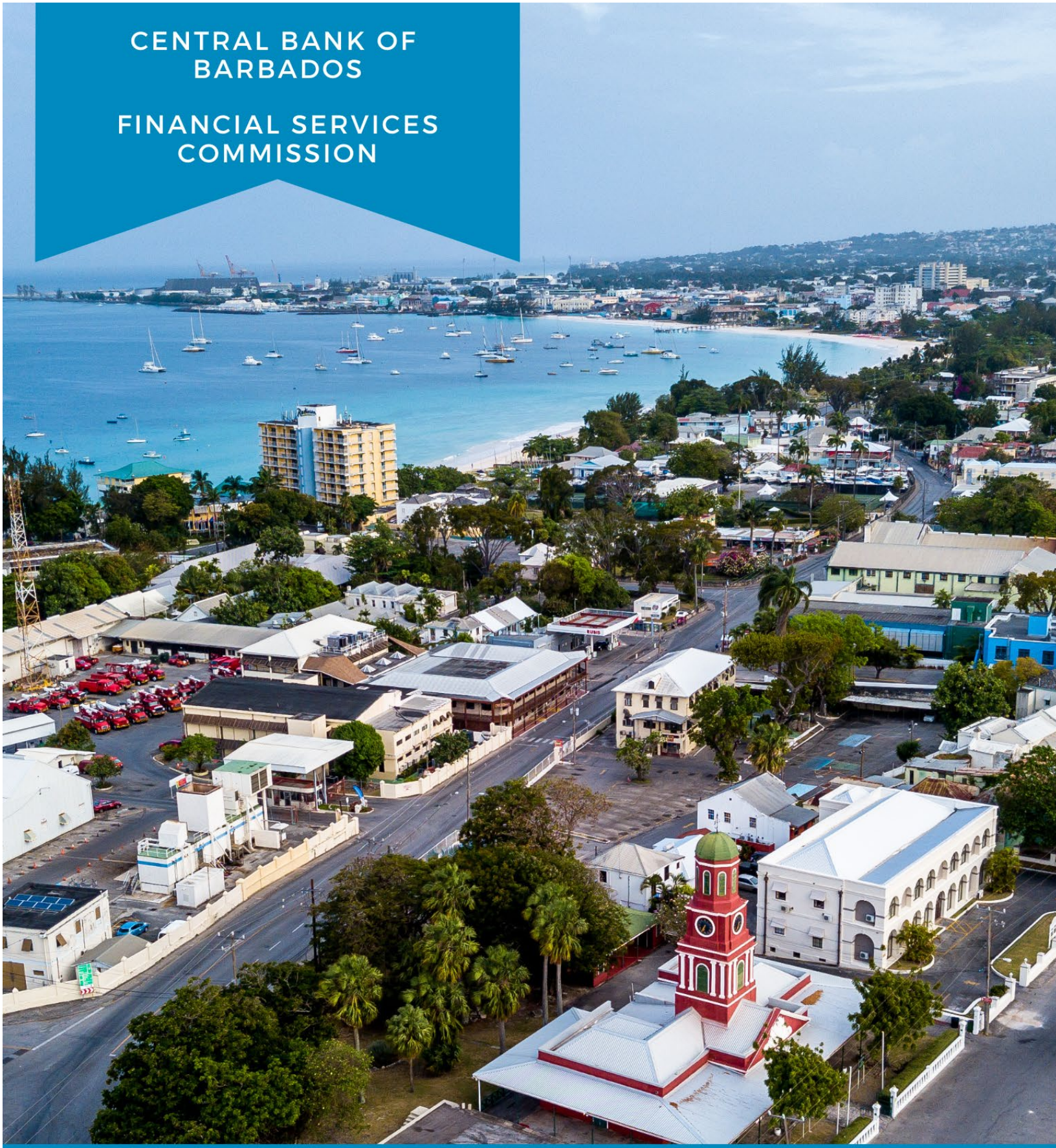
CENTRAL BANK OF BARBADOS

FINANCIAL SERVICES COMMISSION



2021 FINANCIAL STABILITY REPORT

FINANCIAL SERVICES COMMISSION

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Preface

Oversight of the financial system is shared by the Central Bank of Barbados (the Bank), the Financial Services Commission (FSC) and the Barbados Deposit Insurance Corporation (BDIC), in the form of a Financial Oversight Management Committee (FOMC). The FOMC is responsible for maintaining financial stability through the continuous oversight of the financial system, the identification and assessment of vulnerabilities, and the prescription of policies to increase the resilience of the system in the face of possible adverse events.

Financial stability describes the state of a financial system when its three components – financial institutions, financial markets and financial infrastructure – function well, even under somewhat harsh macro-financial conditions. A stable financial system promotes efficient allocation of resources, economic development and the generation of wealth. As such, the new Central Bank Act passed in December 2020 explicitly establishes financial stability as a core mandate of the Bank and recognises the need for macroprudential considerations in policymaking. The Act notes that "where there is a perceived threat to the financial system, the Bank shall manage and control that risk by taking any steps it deems necessary".

This eleventh issue of Barbados' Financial Stability Report is a collaboration between the Bank, the FSC and the BDIC and provides an assessment of the risk exposures of domestic deposit-taking institutions, insurance companies, mutual funds and pension funds. This report analyses a range of financial stability indicators for financial institutions, as well as balance sheet and income and expenditure trends.

Abbreviations

Abbreviation	*Meaning*
ACH	Automated Clearing House
AFSI	Aggregate Financial Stability Index
ATM	Automated Teller Machine
BACHSI	Barbados Automated Clearing House Services Incorporated
BSI	Banking Stability Index
CAR	Capital Adequacy Ratio
CarIFS	Caribbean Integrated Financial Services
CBOE	Chicago Board Options Exchange
DTI	Deposit Taking Institution
FOMC	Financial Oversight Management Committee
FSC	Financial Services Commission
FSI	Financial Soundness Indicators
GDP	Gross Domestic Product
GPW	Gross Premiums Written
IFRS 9	International Financial Reporting Standards 9
IMF	International Monetary Fund
NIR	Net International Reserves
NPL	Non-performing Loan
POS	Point of Sale
ROA	Return on Assets
RTGS	Real Time Gross Settlement
RWA	Risk Weighted Assets

1. Overview

During 2021, Barbados experienced a surge in COVID-19 infections and notable climatic events. In spite of these unfavourable circumstances, increased economic activity and a recovering labour market over the second half of the year kept the financial system stable and resilient. Deposit taking institutions (DTIs) remained well capitalised and registered improved credit quality as the loan moratoria programmes that were introduced in 2020 were winding down. The general and life insurance industry also met regulatory solvency criteria over the course of 2021, while pension plans and mutual funds which have exposure to foreign-issued instruments were boosted by gains in equity markets internationally.

Outstanding loans from DTIs contracted marginally and liquidity continued to grow, sustaining historically low interest rates. Despite the weak credit market, profitability strengthened, partly because of a reduction in provisions, particularly by commercial banks, as the economic recovery began to gather momentum.

The ongoing conflict between Russia and Ukraine, global climatic shocks, supply chain disruptions, the sharp rise in global inflation and the increased probability of recessions in the United States and the United Kingdom pose significant downside risks to financial stability. These factors, together with the rising interest rate environment internationally, are likely to generate some losses for equity and fixed income investors, especially for pension funds and life insurance entities.

The impact on DTIs is uncertain, but a deterioration in the domestic labour market and the general business environment could cause Barbados' financial system to grapple with a deterioration of loan quality, profitability and capital adequacy. However, the stress test results of Section 5 suggest that the financial sector is in a position to absorb large but plausible shocks to NPLs, profits and liquidity without the occurrence of systemic instability

The Central Bank of Barbados (Bank) and the Financial Services Commission (FSC) will continue to strengthen the regulatory framework and improve the assessments of systemic risks. Among planned initiatives are for an improved focus and development of capability on climate risk evaluation, cyber risk security, anti-money laundering, and the monitoring of the non-regulated financial sector.

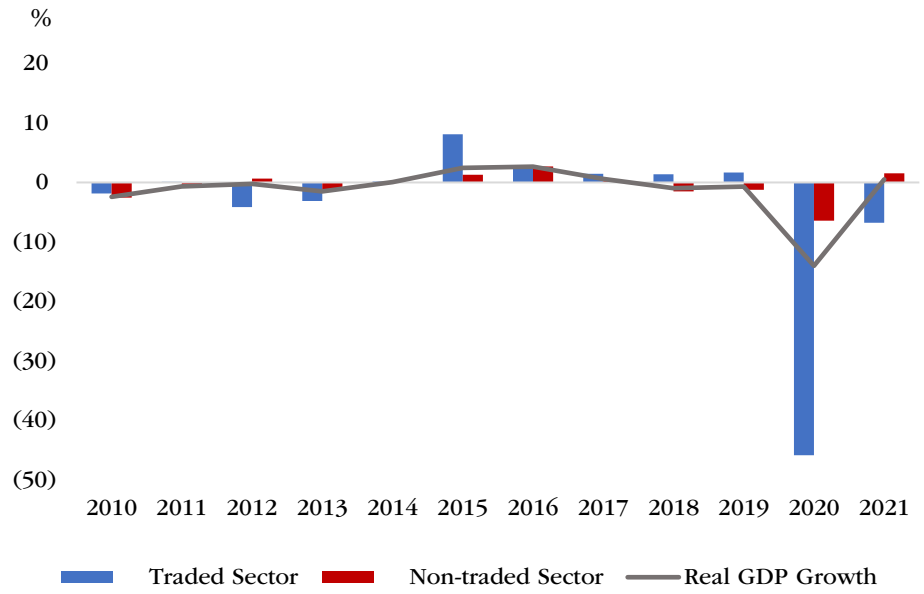
2. Macro-Financial Environment

2.1 Domestic Economic Conditions

The Barbadian economy registered growth of 0.5 percent during 2021, as a nascent recovery in tourism and the reopening of the pandemic-hit economy in the second half of the year supported conditions for financial stability. The modest recovery from the sharp contraction in 2020 reflected the on-going challenges created by the fallout from a second wave of COVID-19 infections, the disruption to economic activity caused by a number of unusual climatic events, and the delayed implementation of several planned investment projects. The increased activity was led by the non-traded sector which grew by 1.5 percent, but fewer tourist arrivals and lower non-sugar agricultural production contributed to a 6.8 percent contraction in the traded sector.

Economies of key source markets strengthened but the impact of on-going COVID-19 lockdown measures, particularly in the first half of the year, and the modest recovery of global tourism during the latter half of the year contributed to the overall decline in tourism output (24.6 percent). Employment in the sector rose and was buttressed by increased public sector employment as Government sought to dampen the effects of the climatic events on households. The national unemployment rate fell to 10.9 percent at the end of 2021 from a peak of 17.2 percent in the first quarter.

Figure 1: Barbados Real Economic Growth



Sources: Barbados Statistical Service and Central Bank of Barbados

During the first quarter of 2022, economic activity continued to improve, as evidenced by an estimated 11.7 percent expansion in real GDP relative to the suppressed economic

performance in the first quarter of 2021. Both traded and non-traded sectors contributed to this recovery but the traded sector was the main driver, as tourism benefitted from the relaxation of COVID-19 protocols, increased airlift capacity and the two series of England-West Indies cricket matches that attracted thousands of British tourists.

The labour market indicators for the first three months of 2022 also point to a recovery of the Barbadian economy as lower unemployment and greater labour force participation were recorded when compared to the same period in 2021. The impact of elevated international commodity prices caused by supply disruptions, rising freight costs and escalating food and energy prices during the latter half of 2021 continued into the first quarter of 2022. This coupled with the additional inflationary pressures emanating from Russia-Ukraine conflict, resulted in Barbados recording a retail price index for March 2022 that was 9.3 percent higher than that of the corresponding period last year.

Table 1: Real GDP Growth (%) of Select Tourism Source Markets and Destinations

	2019	2020	2021[E]	2022[F]
Major Tourism Source Markets				
Canada	1.9	(5.2)	4.6	3.9
UK	1.7	(9.2)	7.4	3.7
USA	2.3	(3.4)	5.7	3.7
World	2.9	(3.1)	6.1	3.6
Select Caribbean Tourism Destinations				
Antigua & Barbuda	4.9	(20.2)	4.8	6.5
Aruba	(2.1)	(22.3)	16.8	2.7
The Bahamas	0.7	(14.5)	5.6	6.0
Jamaica	1.0	(10.0)	4.4	2.5
St. Lucia	(0.1)	(20.4)	6.8	9.7

Source: World Economic Outlook April 2022
Note: [E] represents estimates and [F] represents forecasts

The public finances remained stable during FY 2021/22. Government registered a primary deficit of almost one percent of GDP as improved revenues ($261 million) were offset by increased non-interest spending ($266), largely on capital spending, health-care costs and repairs to the damage caused by the climatic events.

Financing from domestic sources again contracted, leading to yet another reduction in Government's stock of domestic debt. However, policy-based and project loans from multilateral financial institutions filled the financing gap, contributing to a $485 million increase in debt during the fiscal year. The partial recovery in GDP outweighed the impact of the increase and the public debt ratio fell to 131 percent of GDP at the end of March compared to 142 percent a year earlier.

The support from the IMF and multilateral development banks enabled the international reserves (GIR) to register its fourth consecutive year of growth at the end of 2021. GIR rose by $398.2 million during 2021 as the loan proceeds were more than sufficient to offset the widened current account deficit caused by reduced receipts from tourism and other international trade. The merchandise trade balance accounted for the largest source of the current account deterioration owing to increased value of imports stemming from elevated levels of both import quantities and prices of commodities on the international market.

During the first quarter of 2022, the gross international reserves fell by $39.5 million due primarily to lower net inflows of capital, a higher import bill, and a revaluation loss on foreign fixed-income securities held by the Central Bank. However, foreign exchange availability for the private sector remained strong, with all dealers reporting adequate access to supplies of foreign exchange to service their various clients.

Table 2: Selected Economic Indicators

	2017	2018	2019	2020	2021	March 2021	March 2022
				Percent			
Real Sector							
Real GDP Growth	0.6	(1.0)	(0.7)	(14.0)	0.5	(15.1)	11.7
Inflation (12-Month Moving Average)	4.5	3.7	4.2	3.0	3.0	2.0	4.2
Inflation (Point-to-Point Rate)	7.1	0.7	7.3	1.2	5.2	1.1	9.3
Unemployment Rate	8.2	11.6	8.9	13.6	10.9	17.2	9.0
				In percent of GDP			
Public Sector							
Central Government Balance *(Fiscal Year)*	(4.6)	(0.3)	3.6	(4.8)	(4.8)	(4.2)	(2.8)
Primary Fiscal Balance *(Fiscal Year)*	3.2	3.5	6.0	(1.0)	(0.9)	(3.5)	(1.5)
Central Government Debt	138.5	124.5	117.3	136.1	136.9	141.8	130.8
Gross Public Sector Debt	150.0	125.4	118.0	136.6	137.4	142.4	131.3
External Sector							
Current Account	(3.8)	(4.4)	(2.8)	(5.9)	(10.9)	(13.7)	(7.7)
Financial Account	0.4	8.5	7.3	17.3	12.4	8.2	5.4
				BDS $Mil, unless otherwise stated			
Monetary							
Net Domestic Assets	1,997	1,789	1,762	1,296	1,479	1,736	1,885
NIR	335	832	1,139	2,195	2,595	2,096	2,536
GIR	411	1000	1,481	2,661	3,059	2,574	3,019
Import Reserve Cover (Goods & Services) (Weeks)	5.3	12.8	18.6	40.7	40.6	43.1	36.4

Sources: Barbados Statistical Service and Central Bank of Barbados

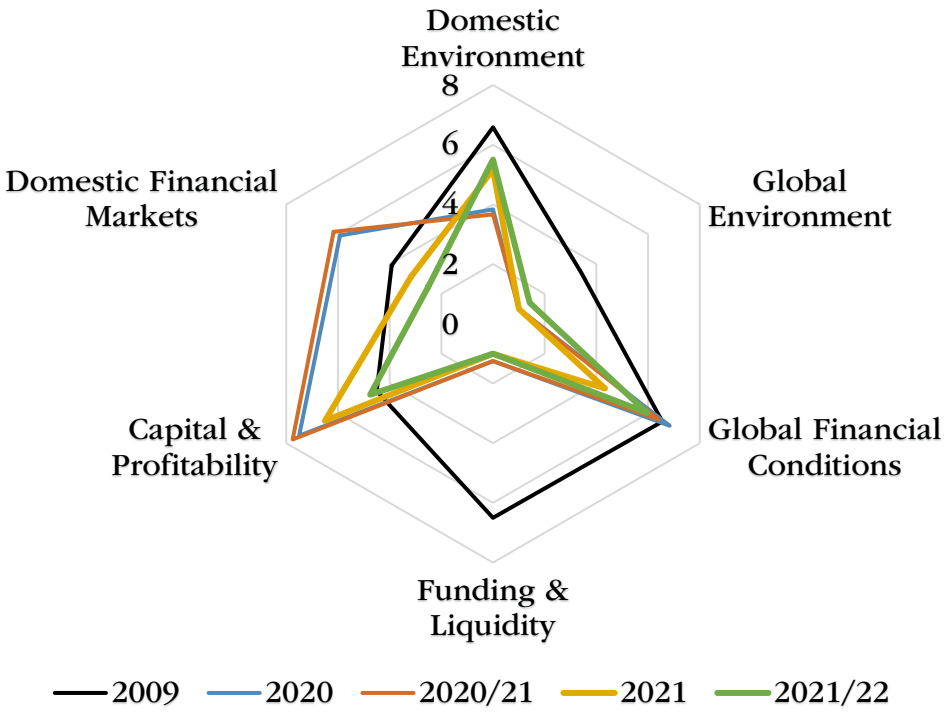
2.2 Macro-Financial Risks

The macro-financial environment improved during 2021 and the first three months of 2022, as indicated by the Financial Stability Cobweb, the Aggregate Financial Stability Index and the Banking Stability Index. These indices quantify the relative balance between risk and stability in the Barbadian financial system. Information on the construction of the indicators is presented in **Appendix A**.

Financial Stability Cobweb

The Financial Stability Cobweb (**Figure 2**) provides a graphical summary of the risk exposure across six dimensions: the domestic environment, domestic financial markets, capital and profitability, funding and liquidity, global financial conditions, and the global environment. Increases in risk are represented by larger values across particular dimensions indexed from zero to ten, but the cobweb does not provide an aggregate indicator of risk. For this report, scores for the six selected dimensions of financial stability risk were computed for the periods 2021 and 2021/22 (April 2021 - March 2022) for comparative analysis.

Figure 2: Financial Stability Cobweb



Source: Central Bank of Barbados

Note: Movement away from the centre reflects an increase in risk, while movement towards the centre reflects a reduction in risk.

Four of the financial stability risk dimensions contracted over the review periods. The risk associated with Global Financial Conditions was lower in 2021 and 2021/22 than in 2020 and 2020/21. Reduced volatility, improved returns in international stock markets and a narrowing of the spread between bonds from emerging market economies and advanced economies accounted for the better performance. However, the 2021 score for the global environment risk indicator was on par with that of 2020 and 2020/21, and the 2021/22 score deteriorated slightly due to rising international oil prices during the first quarter of 2022.

The banking sector experienced improved capital adequacy and after-tax profitability throughout 2021 and the first three months of 2022, translating into a lower risk rating for Capital and Profitability. Funding and Liquidity risk contracted marginally as the declining loan-to-deposit ratio of banks kept liquidity levels on an upward trajectory.

2021 marked the third consecutive year that the Barbados Stock Exchange (BSE) registered a negative average return, but the domestic financial markets dimension improved as the return was less negative. A modest deterioration in the fiscal balance and sovereign debt stock as a percentage of GDP resulted in a higher risk score for Barbados' Domestic Environment in 2021 when compared to that of 2020. This risk increased even more during 2021/22 despite improved debt indicators. However, this was due to greater inflationary pressures as reflected in a 6.5 percent average point-to-point pickup in local retail prices over the first three months of 2022.

A comparison of recent risk exposures to 2009 when the world economy contracted following the collapse of the US sub-prime mortgage market reveals that

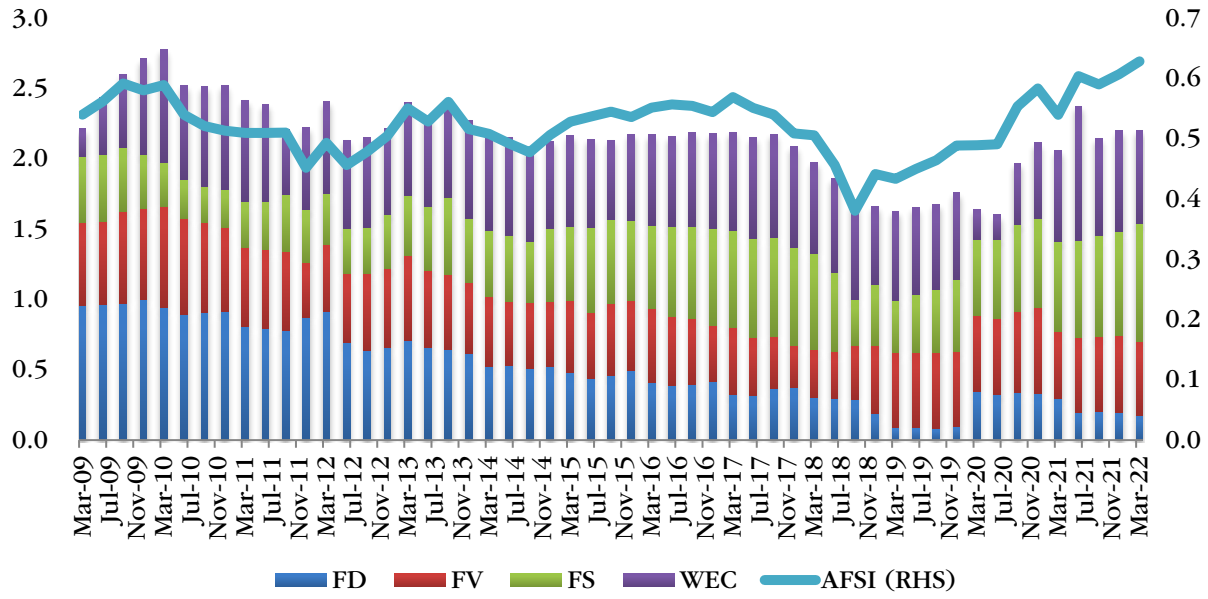
a. The risk scores for Funding & Liquidity, Global Environment and Domestic Environment in 2009 are broadly higher than those recorded during this recent COVID-19 period of 2020 to 2021/22 (Figure 2).
b. The Global Financial Conditions dimension in 2009 was characterised by very high levels of financial market volatility and elevated risk premiums in the bond markets of developed countries. However, 2020 exhibited slightly more risks than 2009 due to comparatively lower returns on the international stock markets during the global onset of COVID-19.
c. Based on the average return of stocks traded on the local stock market, the risk that emanated from Domestic Financial Markets during 2009 was lower than that of 2020 and 2020/21 but higher than the scores for 2021 and 2021/22, an indication of a gradual economic recovery.
d. The capital adequacy ratio and the return on average assets of commercial banks were higher in 2009 than in the recent periods, reflected in relatively higher capital and profitability risk score for 2020, 2020/21, 2021 and 2021/22.

Aggregated Financial Stability Index

The Aggregated Financial Stability Index (ASFI) is a composite measure that assesses the stability of the commercial banking sector. It is generated as a weighted average of normalised macroeconomic and financial statement variables, with four major sub-indices, namely, Financial Development (FD), Financial Vulnerability (FV), Financial Soundness (FS), and the World's Economic Climate (WEC). After being normalised, all individual variables were converted so that an increase indicates an improvement in financial stability. Sub-indices were calculated using equal weights and the ASFI is a weighted sum of these variables.

Figure 3 shows that the AFSI strengthened during 2021 and the first quarter of 2022. Underpinned by faster world economic growth, better perceptions about the world economic climate, dampened volatility in the US stock market, higher domestic bank liquidity and stronger capital positions of local banks, the WEC and FS sub-indices drove the improvement of the AFSI in 2021. Favourable outturns of these two sub-indices, along with a rise in FV due to an improved balance of payments situation, led to the index for March 2022 being higher than that of the comparable period last year.

Figure 3: Aggregate Financial Stability Index



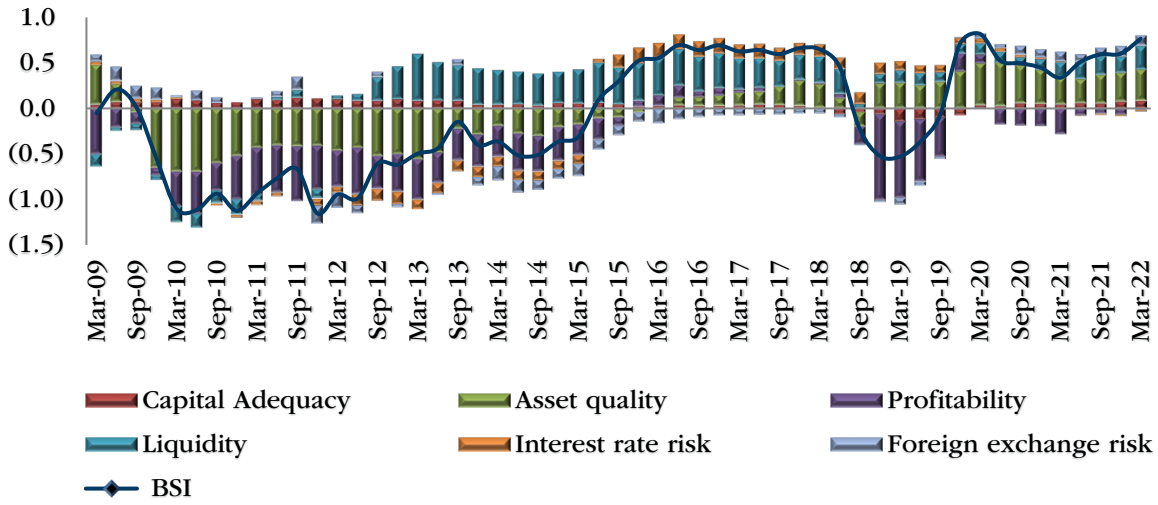
Source: Central Bank of Barbados

Banking Stability Index

The Banking Stability Index (BSI) measures the financial stability of banks in a single index via a weighted average of standardised banking sector indicators, namely, capital adequacy, asset quality, profitability, liquidity, foreign exchange rate risk and interest

rate risk. The higher the index, the more financially stable the banking sector is deemed to be. By the end of March 2022, the BSI rose relative to that of the corresponding period in 2021. With the exception of interest rate risk, all components of the BSI improved, as shown in Figure 4. The profitability sub-index registered the largest improvement given the rise in pre-tax profits relative to equity and total assets. The increased interest rate risk reflects a narrowing of the spread between interest rates on loans and deposits.

Figure 4: Banking Stability Index



Source: Central Bank of Barbados

2.2.1 Financial Sector Interconnectedness

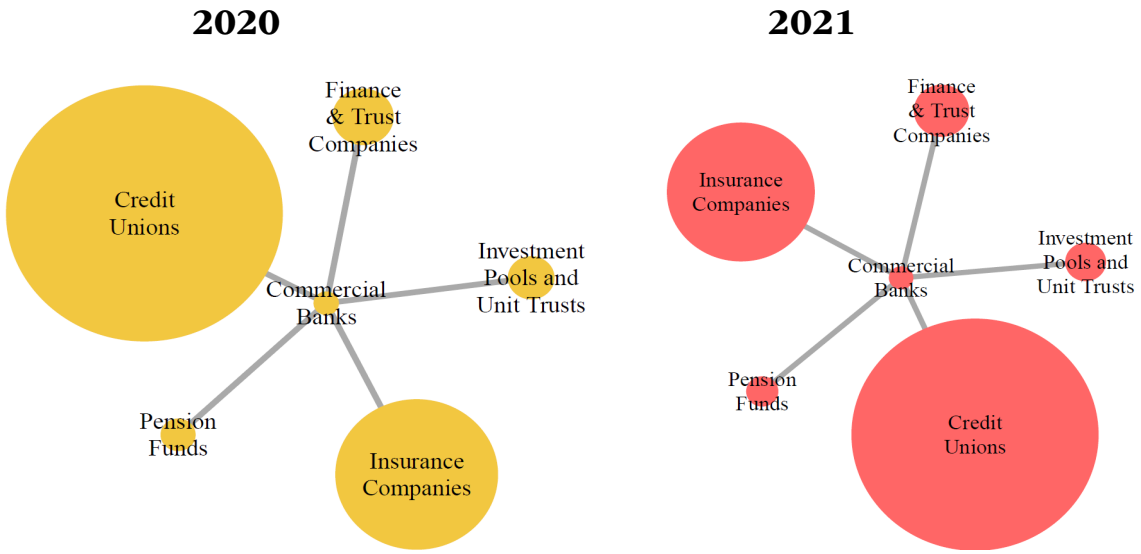
Contagion risk arises through direct and indirect linkages. Thus, it is critical to examine the interconnectedness between financial players. A comprehensive assessment of financial system interconnectedness requires the analysis of not only interbank linkages but also the linkages between bank and non-bank financial institutions (cross-sectoral) and cross-border positions.

2.2.1.1 Cross-sectoral Analysis

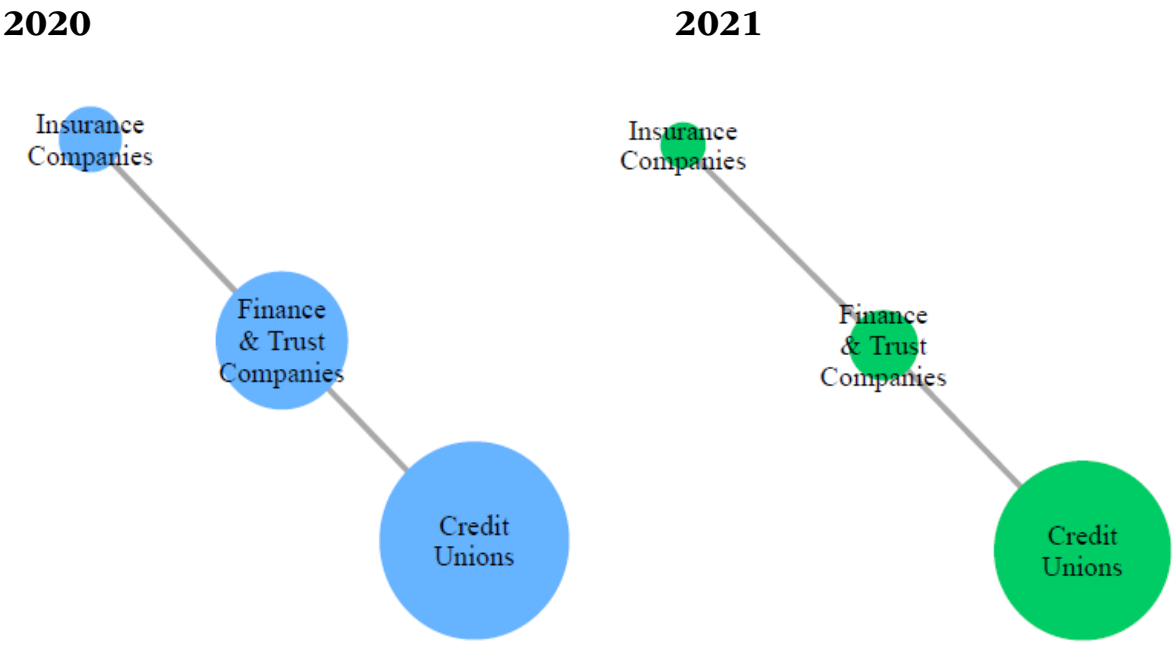
Network analysis was used to assess direct cross-sectoral linkages arising through deposit balances held by other financial sub-sectors. These measures thus consider the share of the assets of sub-sectors held in commercial banks and deposit-taking finance and trust companies. Cross-sectoral exposures to commercial banks slightly increased for all subsectors with increases ranging from 0.1 percent to 0.5 percent relative to last year. Credit unions remained the most exposed to commercial banks with a ratio of 16.3 percent while pension funds were the least exposed to commercial banks with a ratio of 1.3 percent.

Furthermore, the network analysis revealed that credit unions were the most exposed to finance and trust companies. Compared to last year, their exposure increased by 0.1 percent. On the other hand, insurance companies' exposure to finance and trust companies reduced by 0.2 percent.

Figure 5: Cross-sectoral Deposits Network



Source: Central Bank of Barbados



Source: Central Bank of Barbados

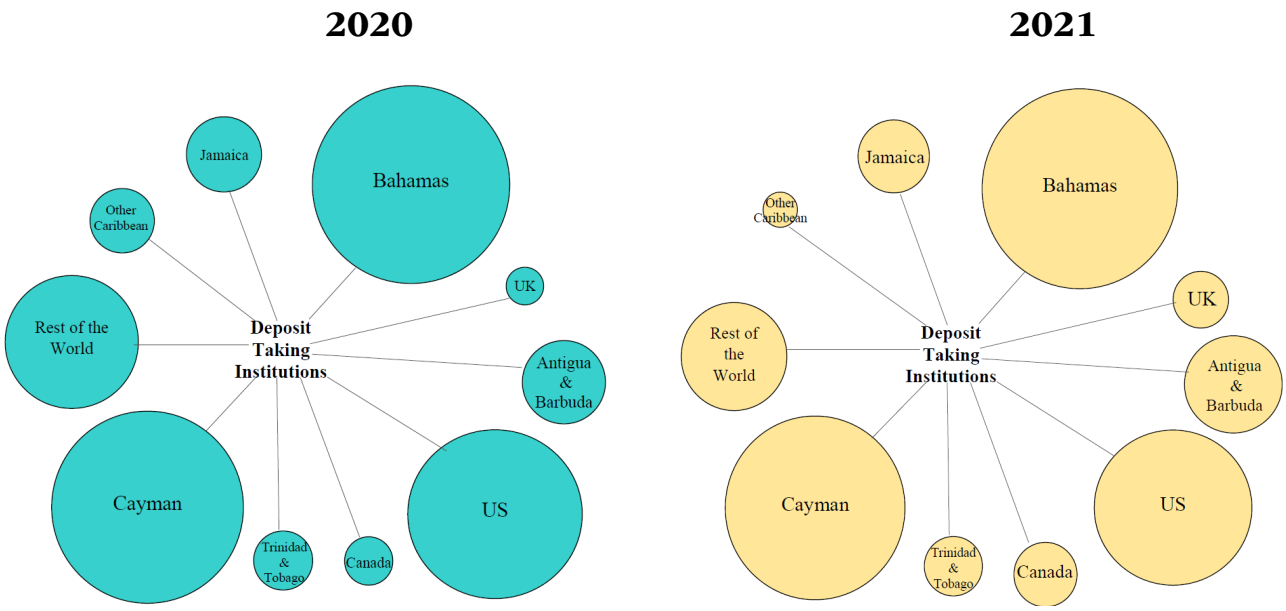
Note: Outer nodes represent the subsectors' deposits in the centre node relative to the assets of that financial subsector.

2.2.1.2 Cross-border Analysis

Foreign assets (also referred to as claims on non-residents and cross-border assets) averaged 17.5 percent of total assets held by commercial banks, bank holding companies, deposit-taking finance and trust companies and credit unions over the past two years. The foreign assets presented in Figure 6 comprise equity, debt securities, loans, deposits and accounts receivable of these institutions. Equity holdings, which are concentrated in a few institutions, make up about 51 percent of foreign assets and represent investments primarily in The Bahamas, Cayman Islands and Jamaica.

Cross-border assets grew moderately in 2021 as equity holdings remained virtually unchanged, while the debt instrument portion expanded on account of greater investment debt securities and a rise in deposits held in banks abroad. These movements resulted in increased exposure to the economies of Guyana, Dominica, Antigua and Barbuda, The Bahamas, USA, Canada, St. Lucia, the UK, The Netherlands and Trinidad and Tobago.

Figure 6: Cross-border Assets Network



Source: Central Bank of Barbados

Note: Outer nodes represent equity and debt claims of deposit-taking institutions on residents of the respective country groupings.

3. Financial Sector Developments

3.1 Structure of the Financial System

Total assets in the financial system expanded by 5.4 percent to represent 275 percent of economic output at the end of 2021 (**Table 3**), with all segments in the system experiencing growth during the period.

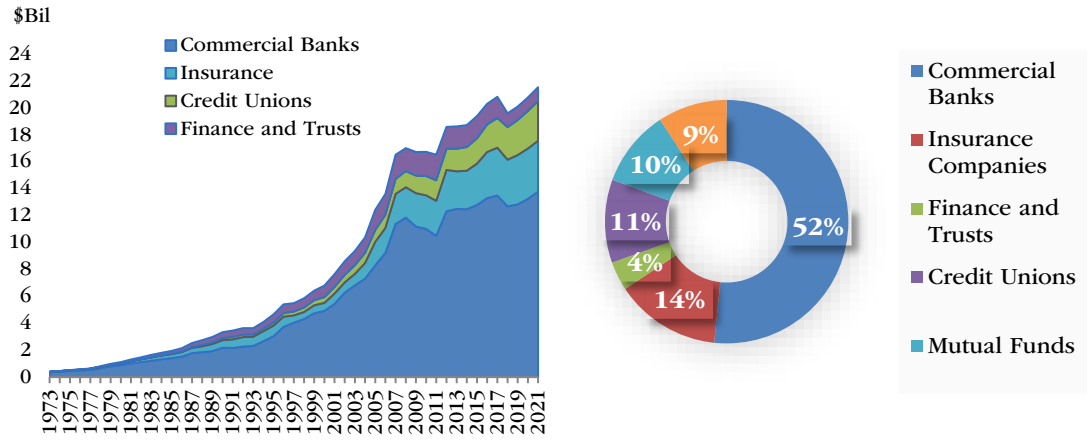
Table 3: Assets of Financial Services Sector*

$Mil	2016	2017	2018	2019	2020	2021
Commercial Banks	13,280	13,469	12,770	12,825	13,223	13,760
Insurance Companies	3,069	3,424	3,553	3,471	3,649	3,798
Finance & Trusts Companies	1,535	1,569	1,016	995	991	1,031
Credit Unions	2,035	2,212	2,422	2,603	2,794	2,942
Mutual Funds	2,004	2,210	2,125	2,411	2,457	2,716
Pension Funds	2,160	2,319	2,345	2,380	2,152	2,453#
Total	**24,083**	**25,203**	**24,231**	**24,685**	**25,266**	**26,700**

Sources: Central Bank of Barbados and Financial Services Commission
*Notes: *Includes data revisions to prior periods*
#Estimated Value

The distribution of assets in the financial system remained relatively stable during 2021 (**Figure 7**). Commercial banks accounted for the lion's share, followed by insurance companies and credit unions with 14 percent and 11 percent, respectively. Mutual fund companies, pension funds and finance and trust companies maintained their respective shares of 10, 9 and 4 percent **(See Appendix B)**.

Figure 7: Assets in the Financial System by Institution[1]



Sources: Central Bank of Barbados and Financial Services Commission

[1] Mutual fund and pension fund data is not available for the entire historical period.

3.1.1 Deposit Insurance

The Barbados Deposit Insurance Corporation (BDIC) guarantees each depositor at commercial banks and finance and trust companies up to $25,000 on domestic-currency accounts. The value of insurable deposits in the Barbadian financial system grew by 1.4 percent to represent $10.6 billion at the end of 2021 (**Table 4**).

Table 4: Total Estimated Insurable Deposits

($ Millions)	2016	2017	2018	2019	2020	2021
Commercial Banks	8,821	8,836	8,915	9,291	9,740	9,940
Non-banks	873	907	722	740	714	668
Total	**9,694**	**9,743**	**9,637**	**10,031**	**10,454**	**10,608**

Source: Barbados Deposit Insurance Corporation

The estimated accounting value of the Deposit Insurance Fund grew by 12.8 percent to approximately $79 million at the end of 2021 (**Figure 8**). This accumulation was largely due to the receipt of annual premiums and interest earned on investments during the year, which greatly exceeded the operational cost of the Fund. The Fund is now above its previous high-water mark recorded prior to the 2018 debt restructuring.

Figure 8: Deposit Insurance Fund

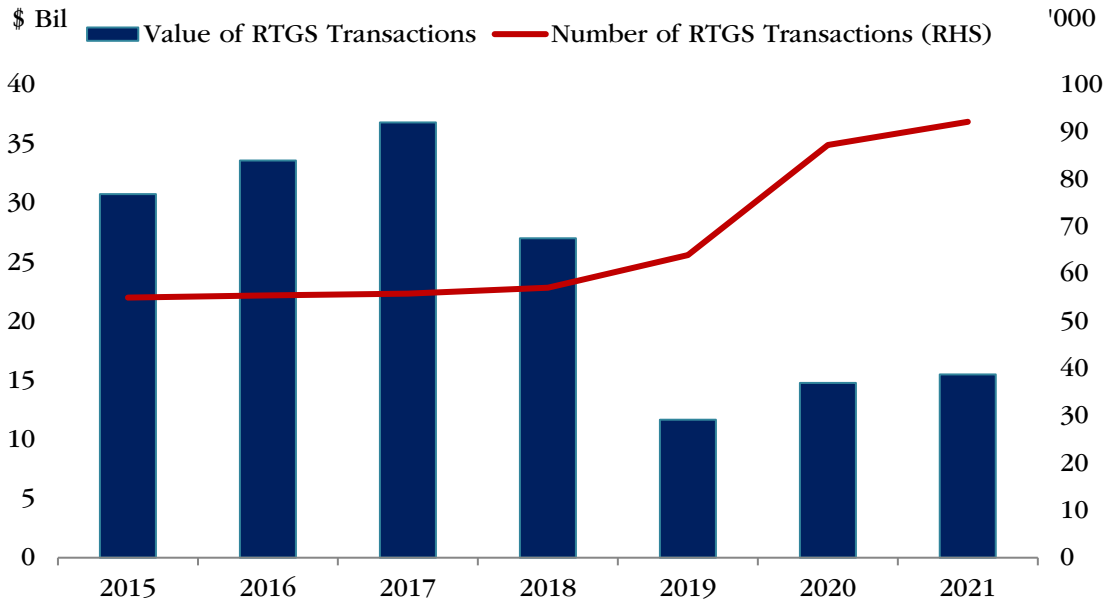
Source: Barbados Deposit Insurance Corporation

3.2 Payments Systems

During 2021, Barbados' domestic payments space continued to support financial stability and facilitate economic activity. Ongoing upgrades to the Barbados Automated Clearing House Services Incorporated (BACHSI)[2], including real time online banking transactions, boosted the use of the automated clearing house (ACH) for direct account payments. Transactions through other electronic payment systems also experienced growth, but cheque payments continued to slide. At the same time, cash payments, as proxied by the level of currency-in-circulation outside of commercial banks and finance and trust companies, remained vibrant.

The value of transactions processed through the Real Time Gross Settlement (RTGS)[3] system increased by 4.9 percent to account for 158 percent of Gross Domestic Product (GDP) for 2021 (**Figure 9**). This increased activity was largely driven by a greater volume of corporation tax and other payments to Government being facilitated via the RTGS platform, as opposed to by cheque. However, with limited new issuance of government bonds, activity has not returned to pre-2018 levels.

Figure 9: RTGS Transactions



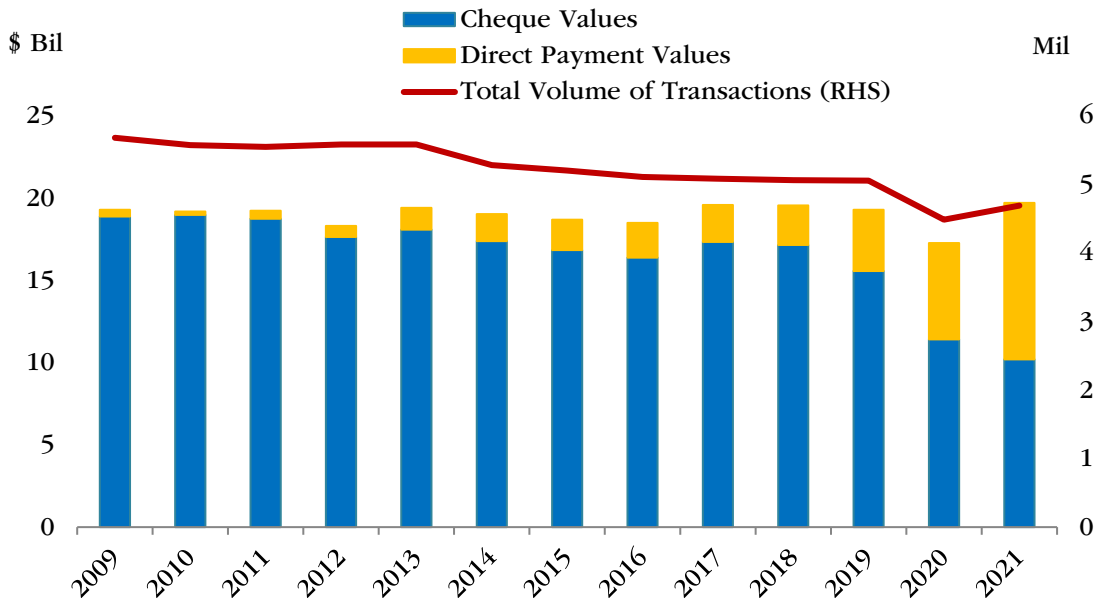
Source: Central Bank of Barbados

The value of transactions processed through the BASCHI system increased by 14.1 percent to $19.7 billion for the year ending 2021 (**Figure 10**). This outturn was 2.2

[2] BACHSI facilitates the clearing of cheques, direct payments and daily inter-bank settlements.
[3] RTGS processes large value and/or time sensitive payments between the domestic banking system and the Central Bank.

percent higher than the value reported for 2019, and was the result of larger direct payments outweighing the declines in cheque payments. Greater use of direct money transfers by Government, businesses and individuals, together with lower cheque writing in favour of electronic systems, led to direct payments accounting for almost half (48 percent) of the transactions processed through the ACH, compared to 34 percent one year earlier.

Figure 10: ACH Transactions



Source: Central Bank of Barbados

Domestic credit card transactions grew by 12.4 percent during 2021 (**Figure 11**), with higher usage by both the personal and corporate sectors as economic activity and global travel picked up. The value of credit card transactions by individuals was $54 million larger during 2021, compared to a decline of $84 million in the previous year. At the same time, the value of credit card payments by businesses were $26 million higher than in 2020, and surpassed the value of transactions completed in 2019 by $18 million.

Deposit-taking institutions transitioned from the local Caribbean Integrated Financial Services Incorporated (CARIFS) system to the chip-and-pin VISA and MasterCard networks for their debit card services. Consequently, transactions processed through the CARIFS network significantly declined for the year as CARIFS cards were gradually phased out (**Figure 12**). Comparing the first six months of 2021 to its corresponding period in 2020, point-of-sale (POS) and automated teller machine (ATM) transactions registered declines due to the early adoption of "chip and pin" cards by some institutions, coupled with the slow rebound in economic activity at the beginning of 2021. Given the strong growth in other customer-focused electronic payments, namely

credit card transactions, the slowdown in deposit growth, and the pick-up in economic activity, it is anticipated that debit card transactions via the newly implemented VISA and MasterCard services increased for the latter half of the year in line with higher consumption demand and increased prices.

Figure 11: Credit Card Transactions

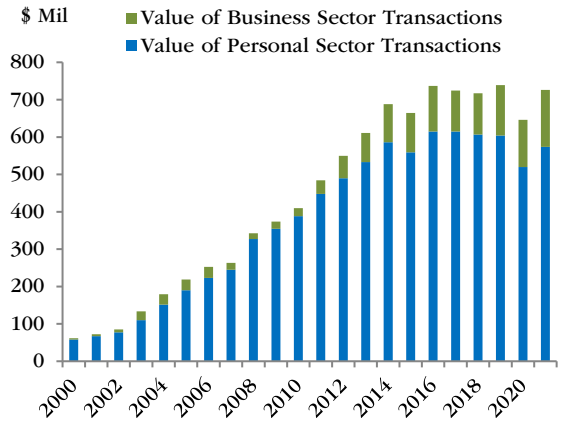
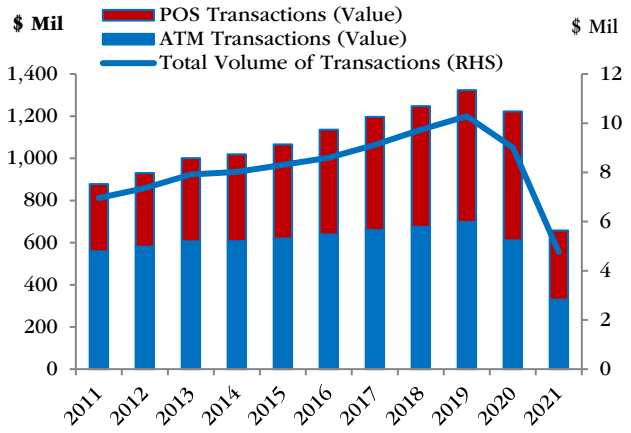


Figure 12: CARIFS Debit Card Transactions[4]



Source: Central Bank of Barbados

Box 1: The Benefits and Costs of Chip-and-Pin Card Technology

The chip-and-pin technology, also known as EMV chip technology, has been around for almost three decades, first being established in Europe in 1994 by Europay[1], MasterCard and Visa. This technology was developed to provide consumers with greater protection against fraud losses by having consumer data stored in a secure chip embedded in the card's plastic, which is authenticated using a four-digit PIN. Despite the technology being available for some time, its widespread adoption mainly took off after 2010 to combat the growing incidences of card fraud and the accompanying losses.

The traditional magnetic strip convenience cards store data in a static way in the card's magnetic strip. This way of storing data has allowed criminals to steal/copy consumer data, from both merchants and consumers, with simple card readers. These fraudsters can then take the stolen data and replicate several copies of the card, which can be used for point-of-sale (POS) transactions or online payments.

[1]Europay International was acquired by MasterCard in 2002.

[4] Data does not capture those transactions facilitated through the VISA and MasterCard networks for debit card services in 2021.

Unlike the magnetic strip cards, EMV chip technology stores authenticated data in a secure chip which can only be processed by a sophisticated chip reader, making it more difficult for criminals to replicate. These cards are therefore considered to be more secure at protecting consumer data for POS transactions than the magnetic strip cards, with the PIN feature providing an extra layer of protection over a signature which can be forged. It is important to note that even with the chip-and-pin cards, in cases where the card is not presented and the consumer must enter his/her information, such as in online payments, the data is still at risk of being compromised.

Payment with the EMV cards can be done via a contact or contactless method. Contact payment requires the chip to be in direct contact with the chip reader, such as when the card is inserted into the POS terminal. On the other hand, contactless payments allow the chip to come within close proximity to the chip reader, such as "tapping" the chip on the terminal.

Given the greater security features and sophistication of the EMV chip technology, there is also a greater cost related to EMV when compared to the traditional magnetic strip system. The chip-and-pin cards are more expensive to manufacture due to the security chip which is built into the card. There is also an infrastructural cost as financial institutions must upgrade automated teller machines (ATMs) to devices with chip readers, and magnet strip POS terminals of merchants must also be switched to chip reader POS terminals. Moreover, the EMV technology is administered by global players such as MasterCard and Visa who tend to have higher fee structures than local convenience card facilitators. There are also higher processing and interchange fees to financial institutions associated with these EVM transactions. Consequently, financial institutions are likely to increase the account fees they charge to customers, as well as the POS terminal rental fee and the merchant discount rates to merchants in order to offset these increased costs.

In the context of Barbados, the chip-and-pin or EMV technology provides consumers with a more secure way to pay, it can be used internationally, and it also facilitates some contactless payments which have been an added benefit in the COVID-19 environment. However, this improvement comes at an additional cost to merchants and consumers who are also operating in a high price setting borne from external inflationary pressures. Therefore, regulators will continue to monitor bank fees to ensure that the interests of consumers are balanced along with the financial viability of financial intuitions.

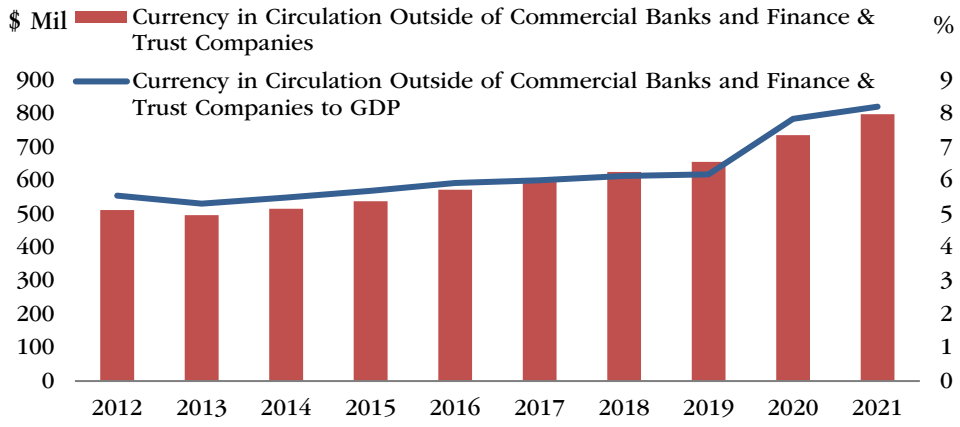
References:

EMVCo, LLC, 2014. A Guide to EMV Chip Technology. [Online] Available at: https://www.emvco.com/wp-content/uploads/2017/05/A_Guide_to_EMV_Chip_Technology_v2.0_20141120122132753.pdf [Accessed 9 September 2022].

King, D., 2012. Chip-and-PIN: Success and Challenges in Reducing fraud. Retail Payments Risk Forum, Volume 26.

The demand for cash persisted during 2021. Currency-in-circulation, outside of those cash balances held by the commercial banks and finance and trust companies, grew by 8.5 percent to just under $800 million or 8.2 percent of GDP for the year (**Figure 13**). This growth suggested that despite the innovation in the traditional electronic payment space, businesses and consumers still preferred to hold some precautionary funds in cash, amidst the prolonged pandemic environment.

Figure 13: Currency-in-Circulation



Source: Central Bank of Barbados

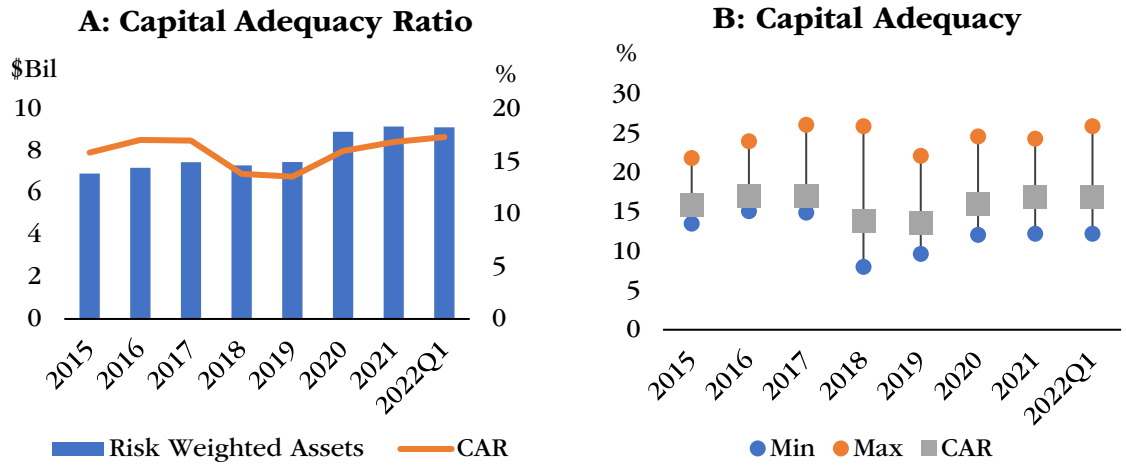
4. Analysis of the Financial System

4.1 Commercial Banks

Commercial banks successfully navigated the pandemic through a combination of strong capital buffers and effective forbearance programmes. The easing of pandemic restrictions in the latter half of 2021 facilitated the recovery of employment levels and business operations, which spurred commercial banks' performance in the same period. The FSIs suggest improved capital adequacy, credit risk, liquidity and profitability **(Appendix C: Table 1)**.

In 2021, the regulatory capital of banks recorded growth of 8.3 percent. The growth in capital raised the capital adequacy ratio (CAR) to 16.8 percent from 16 percent a year earlier, well above the prescribed 8 percent benchmark **(Figure 14A)**. All individual banks maintained a CAR above the benchmark, ranging from 12.2 percent to 24.3 percent **(Figure 14B)**. The CAR levels strengthened further during the first quarter of 2022, reaching 17.3 percent for the sector.

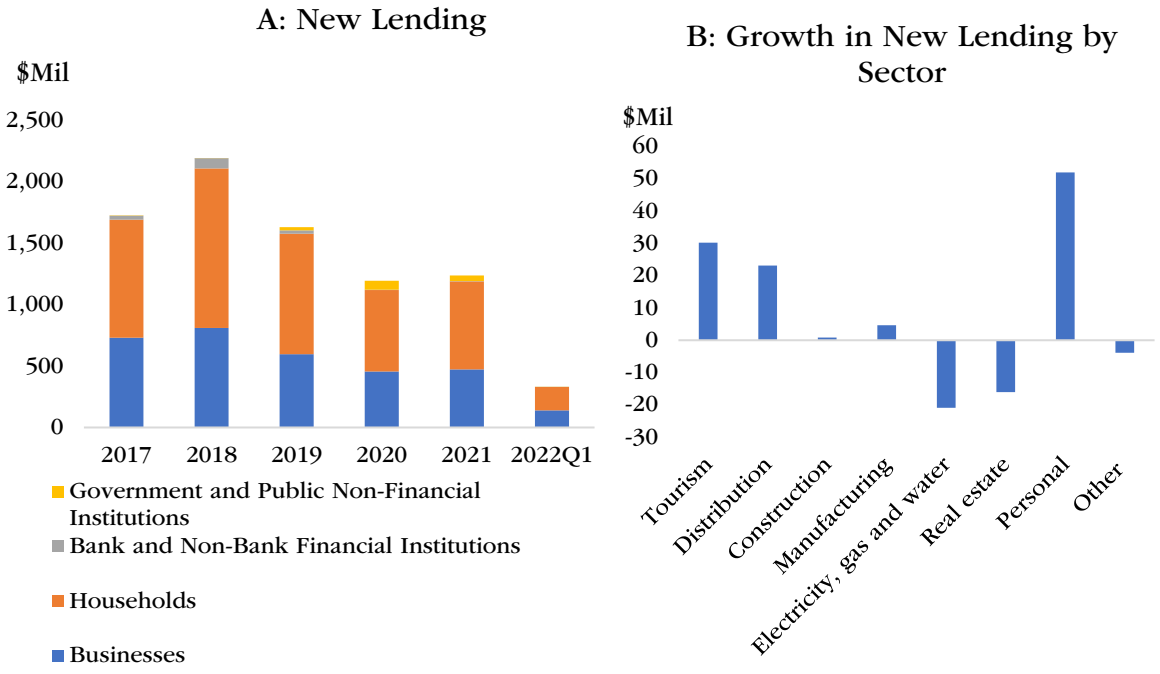
Figure 14: Capital Adequacy



Source: Central Bank of Barbados

With regained confidence in the economy, households and businesses, particularly the tourism and distribution sectors, increased their demand for bank credit **(Figures 15A and 15B)**. Total new lending for 2021 rose by 3.7 percent, a recovery from the decline registered in 2020. Within the business sector, new credit demanded in 2021 was primarily put towards working capital and refinancing.

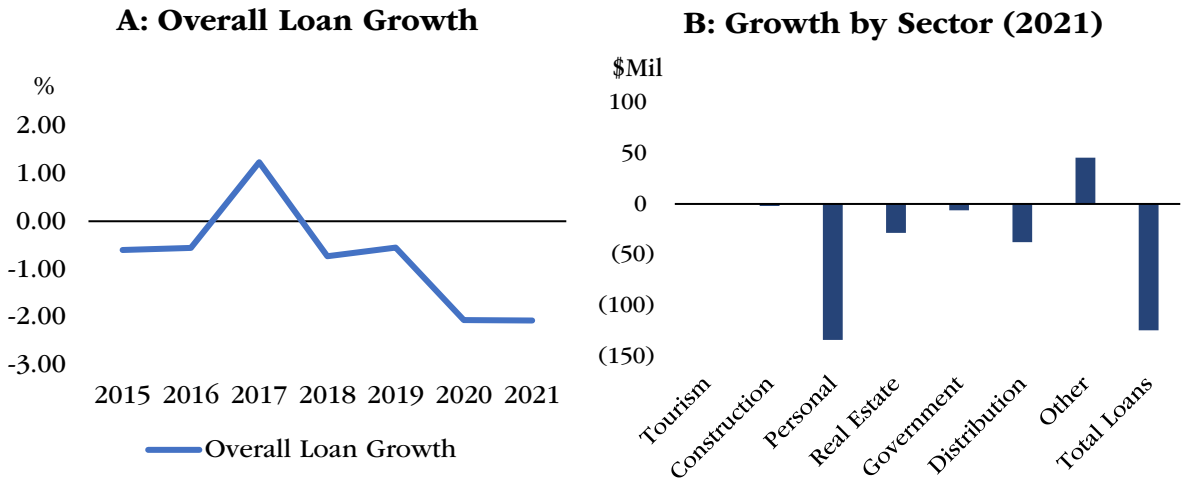
Figure 15: New Lending



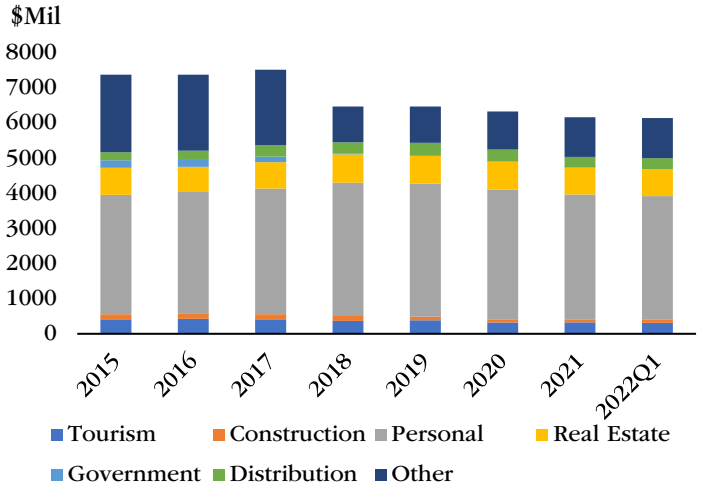
Source: Central Bank of Barbados

While the demand for credit revived, the stock of loans in 2021 fell by 2 percent **(Figure 16A)** as repayments exceeded new credit. All key sectors registered declines, with the exception of utilities, manufacturing, agriculture, hospitality and other deposit-taking institutions **(Figure 16B)**. The exposure to the personal sector, the largest single loan segment **(Figure 16C),** fell by $134 million, as the sector's repayments exceeded new credit. During the first quarter of 2022, commercial banks' loan balances declined further, largely in the personal and tourism sectors. However, there were modest increases in the loan balances of the distribution sector.

Figure 16: Loan Profile



C: Composition of Loans



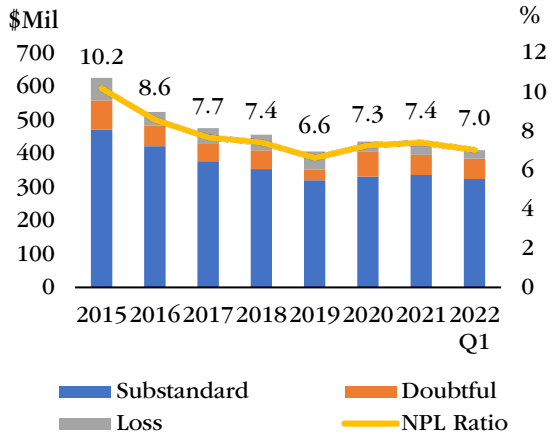
Source: Central Bank of Barbados

As some level of normalcy was restored in the economy, the loan moratorium previously offered by commercial banks was largely phased out during 2021. Nonetheless, non-performing loans remained stable **(Figure 17A)**. A notable increase in NPLs was recorded in the real estate sector due to a few specific firms **(Figure 17B & Figure 17C)**. The NPL ratio was marginally higher at 7.4 percent than for the comparable period in 2020, due to a larger contraction of loan balances. However, the ratio subsequently improved to 7.0 percent as at March, 2022, given a further decline in NPLs during the quarter.

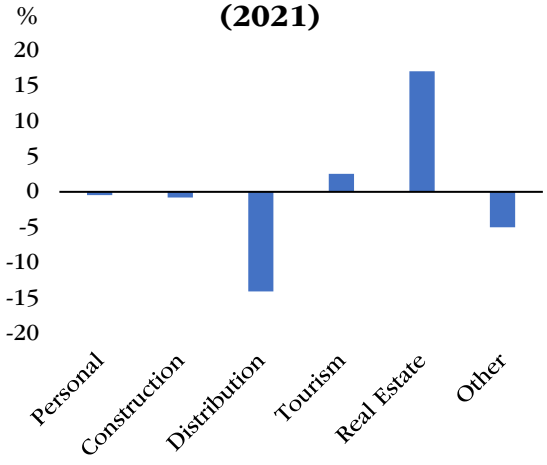
As credit quality improved, commercial banks lowered their provisions which fell from approximately $270 million at end 2020 to $250 million as at March, 2022. Given a much smaller decrease in NPLs in 2021, the provisions-to-NPLs ratio fell at end 2021, from 62 percent in 2020 to 59.6 percent in 2021 **(Figure 17D)**.

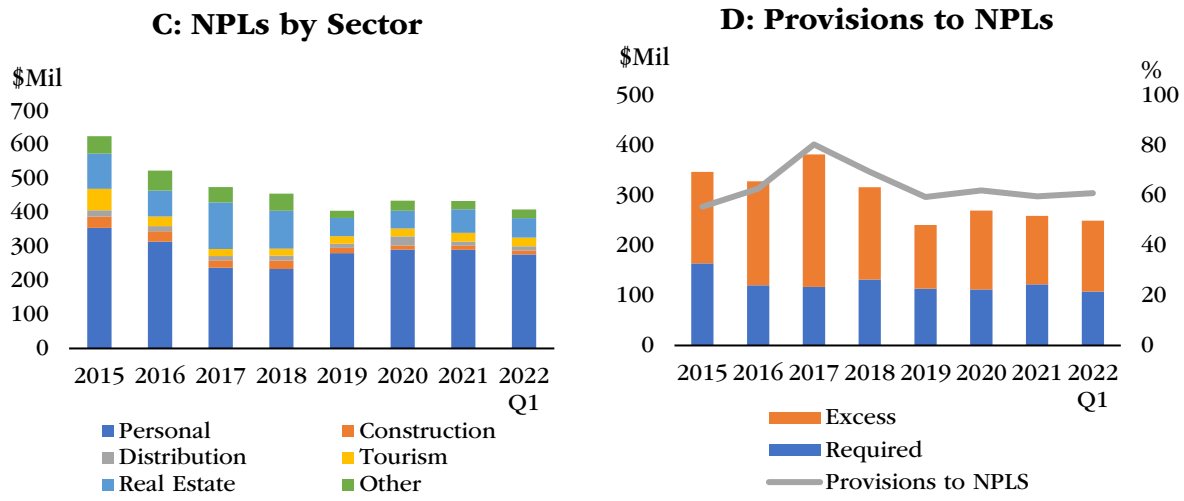
Figure 17: Non-Performing Loans (NPLs) Profile

A: NPLs by Category



B: Growth in NPLs by Sector (2021)

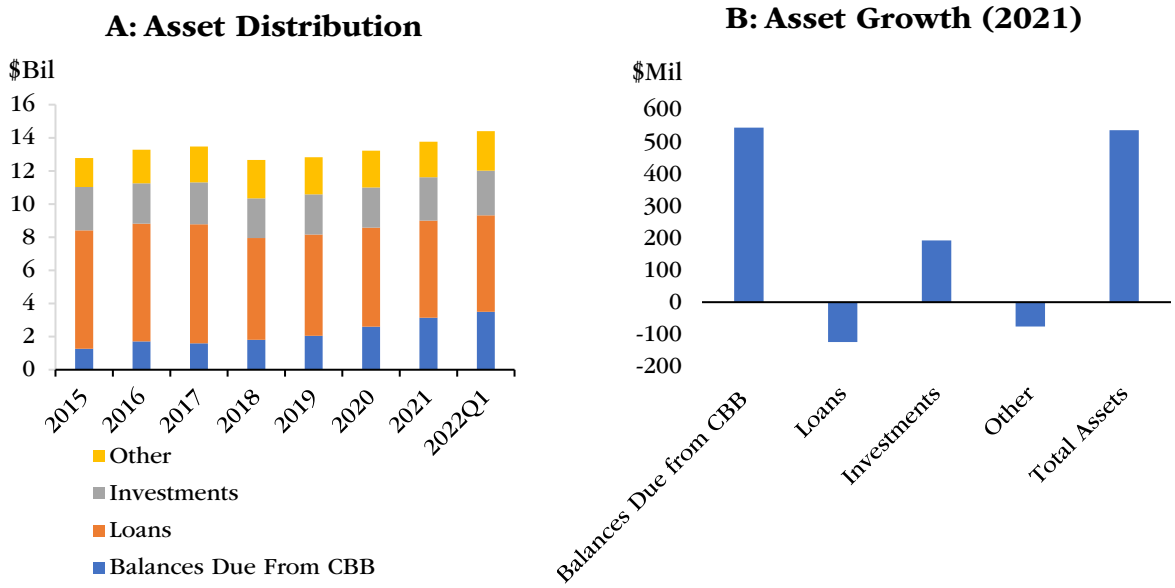


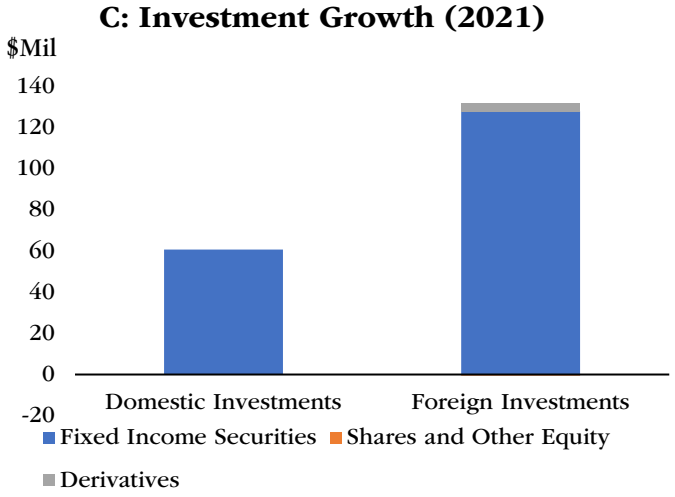


Source: Central Bank of Barbados

Even as loan balances were reduced, loans remained the largest component of commercial banks' assets **(Figure 18A)**. Total assets rose by 4.1 percent to reach $13.8 billion or 141.5 percent of nominal GDP at end 2021. The growth in assets was largely reflected in a 21 percent rise in cash balances held at the Central Bank **(Figure 18B).** Furthermore, commercial banks increased their sovereign exposures as spikes in foreign-currency deposits enabled them to raise their foreign investments, particularly in US treasury bills **(Figure 18C)**. Investments in local fixed income securities also rose modestly, but interest remains tepid in local-currency denominated government securities. During the first three months of 2022, commercial banks' assets continued on their upward trajectory, with deposits at the Central Bank rising steadily.

Figure 18: Total Assets



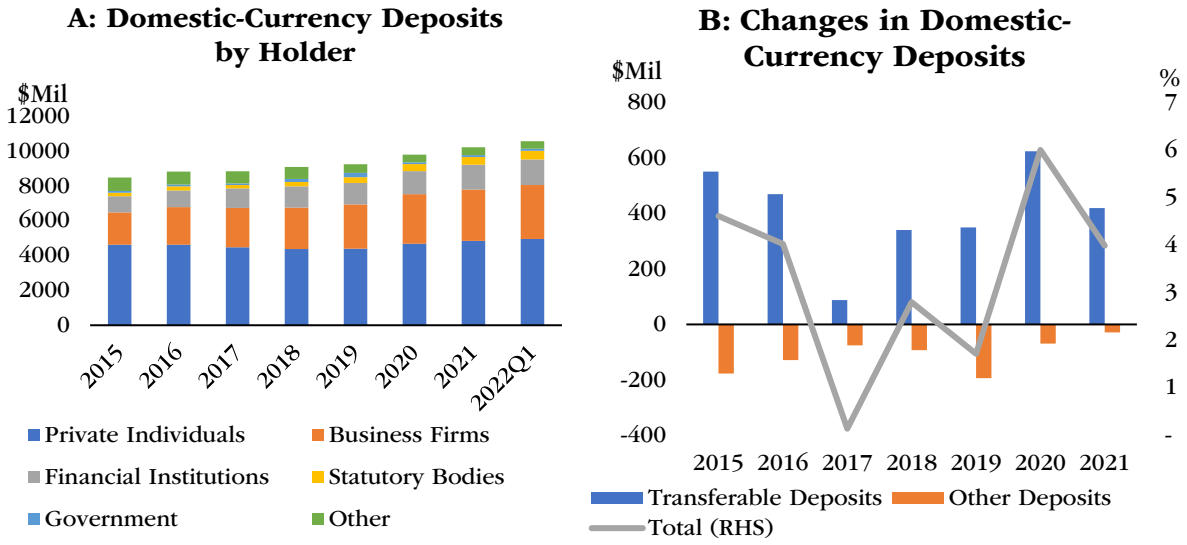


Source: Central Bank of Barbados

Domestic-currency deposits grew by 4 percent, a slower pace than the 6 percent growth recorded in 2020. The continued deposit growth partly reflected the monetary effects of the fiscal relaxation and was mirrored in the $170 million expansion of holdings of individuals. This growth persisted into the first quarter of 2022, with deposits reaching $10.7 billion **(Figure 19A).**

Abundant liquidity continued to erode interest in the provision of and the demand for time deposits. Consequently, transferable deposits remained as the predominant category of domestic-currency deposits, amounting to 96.3 percent of total domestic-currency deposits. **(Figure 19B).**

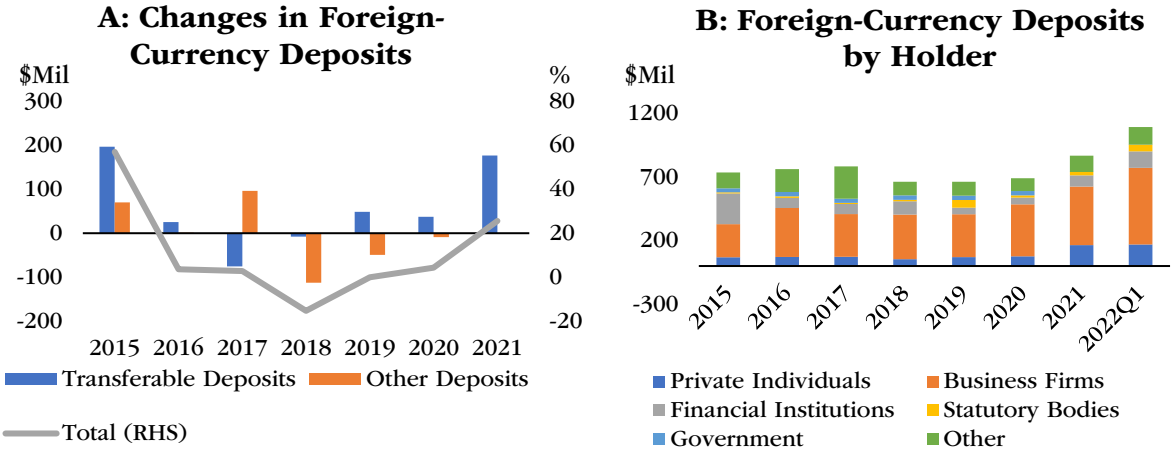
Figure 19: Domestic-Currency Deposits



Source: Central Bank of Barbados

Foreign-currency deposits represented approximately 8 percent of total deposits at year-end, as the stock of foreign currency deposits grew by 26 percent **(Figure 20A).** Foreign-currency deposits, expanded across most sectors, with individuals and business firms registering the largest increases. This growth reflects increased demand for foreign-currency accounts following the liberalisation of these deposit accounts in August 2019. The growth of foreign currency deposits was sustained into the first quarter of 2022, in part the result of the strong upturn in tourism-related activities **(Figure 20B).**

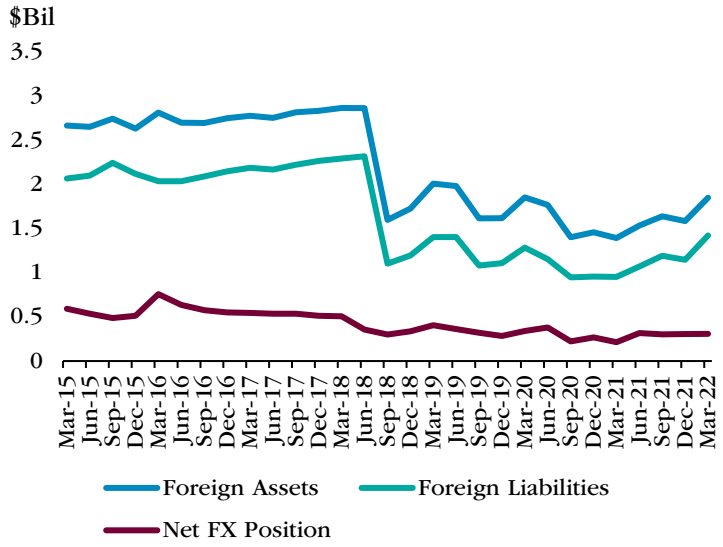
Figure 20: Foreign-Currency Deposits



Source: Central Bank of Barbados

Despite the build-up of both foreign assets and liabilities, the net foreign position remains stable **(Figure 21)**.

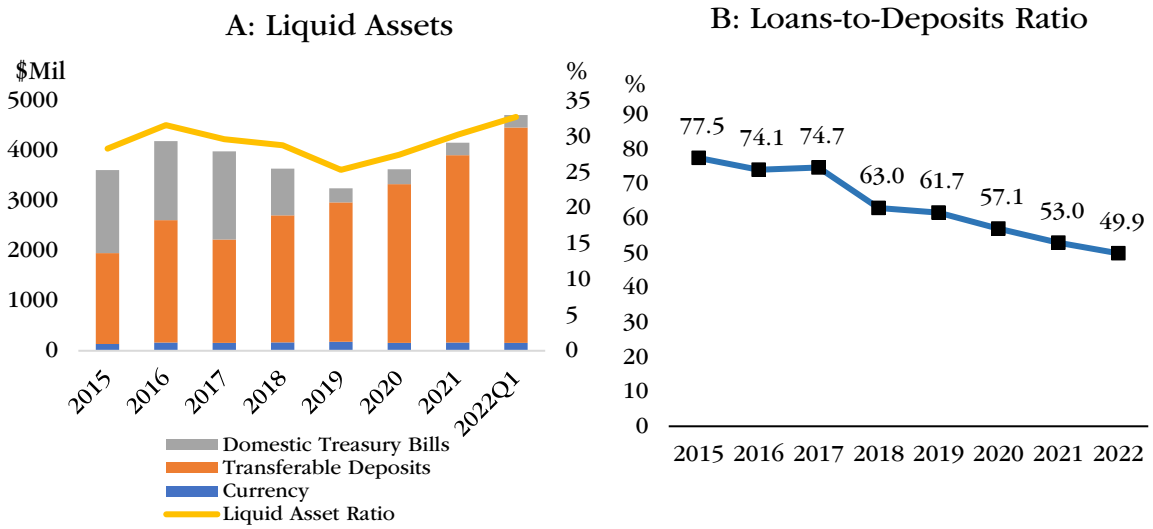
Figure 21: Net Foreign-Currency Position



Source: Central Bank of Barbados

Liquidity in the commercial banking system has been mounting for the past decade with consistent increases in liquid assets being recorded for the past five years **(Figure 22A)**. In 2021, liquid assets grew by 17.4 percent. The loans-to-deposits ratio continued its decline to 53 percent at yearend **(Figure 22B).** The liquid asset ratio rose to 28.4 percent at the end of 2021 and 31 percent by the first quarter of 2022.

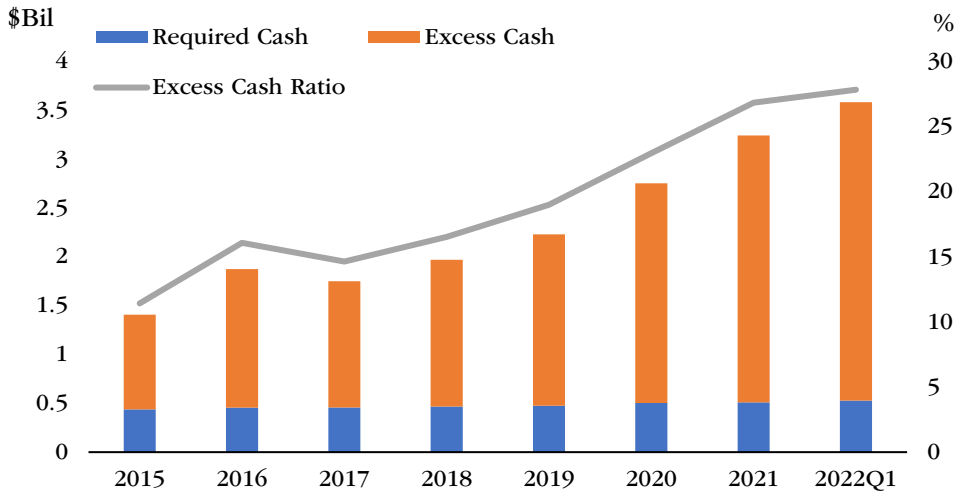
Figure 22: Liquidity



Source: Central Bank of Barbados

Moreover, excess cash holdings of commercial banks continued to increase during 2021 **(Figure 23).** At the end of 2021, commercial banks held $2.7 billion in excess cash, which represents an increase of $0.5 billion from that of end 2020. A further increase of $0.3 billion was recorded during the first quarter of 2022.

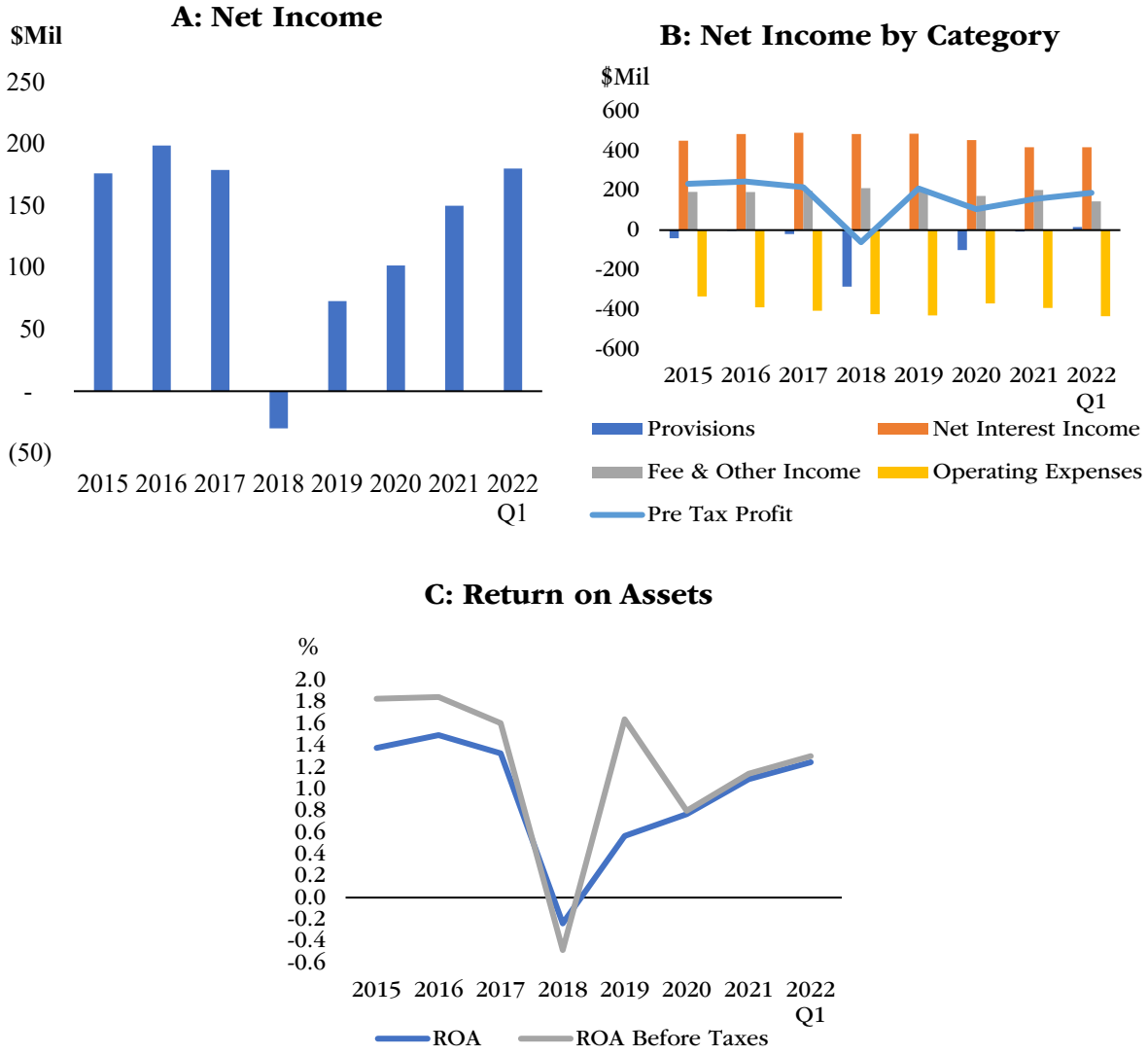
Figure 23: Excess Cash



Source: Central Bank of Barbados

The profitability of banks increased by $48.3 million **(Figures 24A)**. However, the low interest rate environment coupled with the lower stock of loans, led to a deterioration of banks' net interest income. Those losses were outweighed by gains from reduced provisions and the favourable effect of increased fees and commissions income on non-interest income **(Figures 24B).** Consequently, this was reflected by the improved return on assets (ROA) ratio of 1.1 percent **(Figure 24C).** The average ROA for the preceding 12 years (2009-2021) measures 0.94 percent, a notable decline from the average ROA of 2.1 percent for the period 1996 to 2008 when there was stronger economic growth.

Figure 24: Profitability



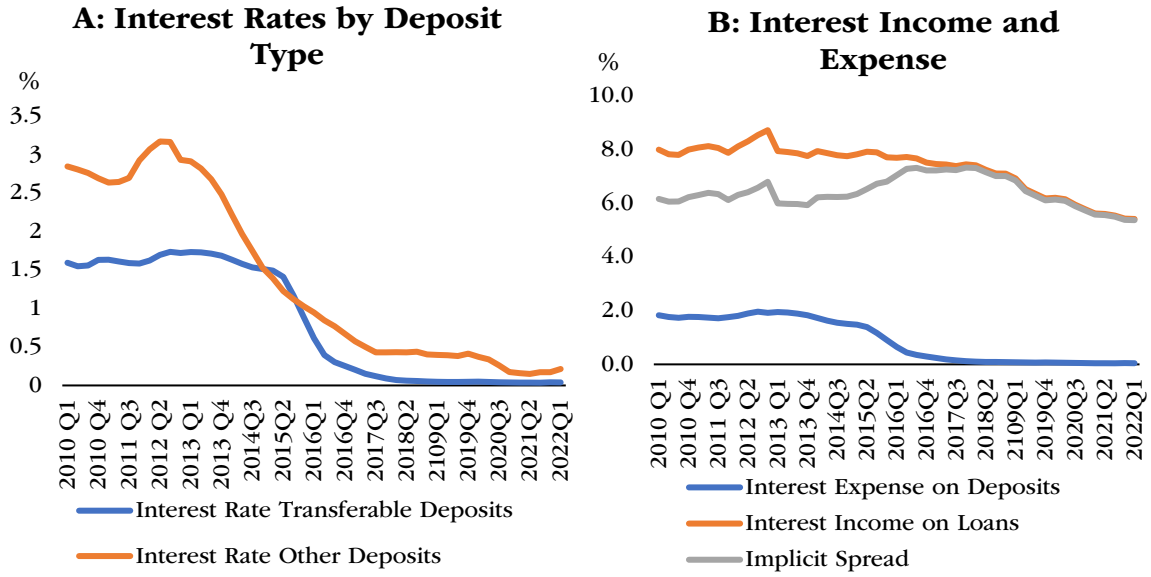
Source: Central Bank of Barbados

Since the elimination of the minimum deposit rate in 2015, interest rates on deposits have gradually declined and remained low during the review period. In 2021, the average interest paid on transferable deposits was approximately 0.04 percent while the average interest paid on other types of deposits stood at roughly 0.2 percent **(Figure**

25A). Loan rates continued to decline and by the first quarter of 2022, the effective interest rate on loans had fallen from 5.8 percent at end 2020 to 5.4 percent at March, 2022.

As a result, the implicit spread narrowed to 5.4 percent at end 2021 compared to 6.3 percent in 2015 **(Figure 25B).** While the lower deposit rates caused the implicit spread to rise in 2015, lower loan rates are now pushing the spread downward. Prime lending rates and mortgage rates have also been moving downward, measuring 4 percent and 4.7 percent, compared to 7.7 percent and 6.1 percent, respectively.

Figure 25: Commercial Banks' Effective Interest Rates

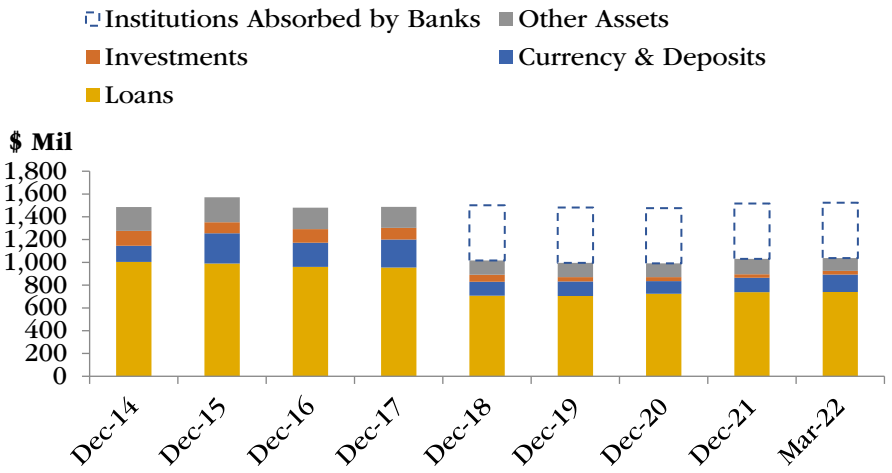


Source: Central Bank of Barbados

4.2 Deposit-Taking Finance and Trust Companies

The performance of deposit-taking finance and trust companies largely mirrors that of banks, with total assets experiencing a 4 percent increase during 2021**(Figure 26).** This asset growth was driven by higher deposit holdings at other financial institutions, and an increase in the loan book. As at March 2022, assets further expanded by 0.7 percent, when compared to year-end 2022.

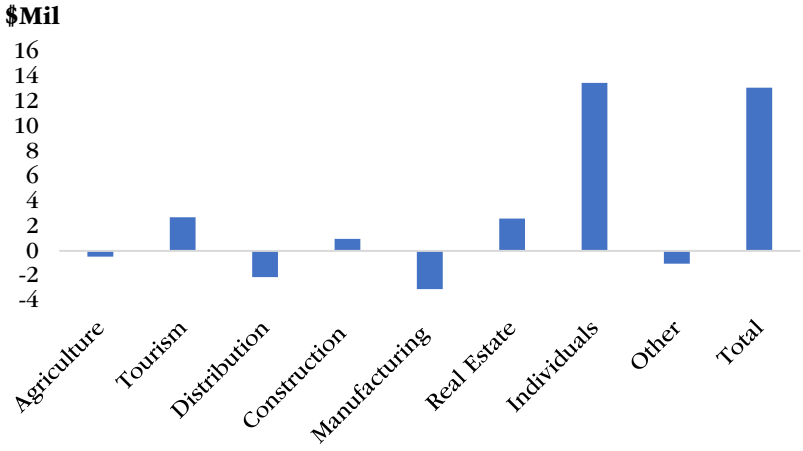
Figure 26: Asset Distribution



Source: Central Bank of Barbados

Loans remained the major asset class, growing by 1.8 percent and accounting for over 71 percent of assets. The outturn for loans was mainly driven by increases in credit to individuals, largely for mortgages **(Figure 27).**

Figure 27: Loan Growth by Sector

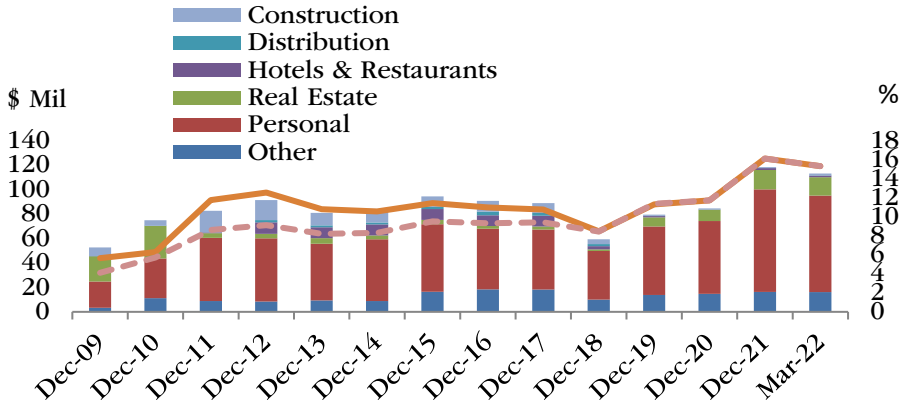


Source: Central Bank of Barbados

NPLs increased to 16.1 percent of total outstanding loans, up from 11.7 percent one year prior. The level of loan delinquency rose for all major sectors with the exception

of health, manufacturing, agriculture and construction. However, the first three months of 2022 saw a modest improvement in credit quality as the NPL ratio edged down to 15.3 percent **(Figure 28).**

Figure 28: Non-Performing Loans by Sector

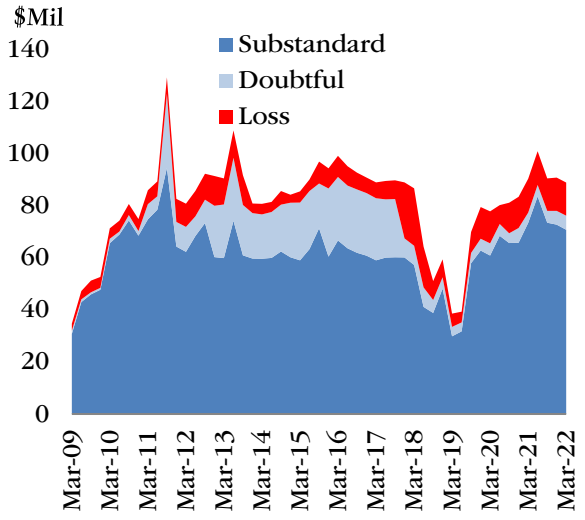


Source: Central Bank of Barbados

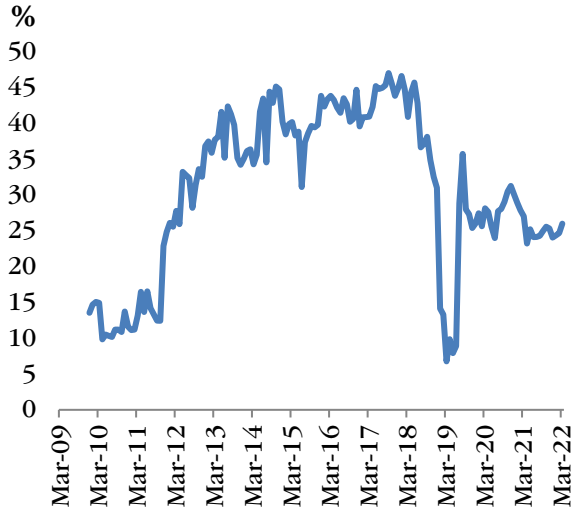
The broad distribution of NPLs across risk categorisations remained virtually unchanged up to March 2022, compared to former years. Approximately 83.6 percent of impaired loans fell into the "substandard" classification, while, 4.1 percent and 12.3 percent were in the "doubtful" and "loss" classifications, respectively **(Figure 29A).** Provisions for non-performing loans slipped to 26 percent, down slightly from March 2021 **(Figure 29B).** This level of provisioning is consistent with regulatory requirements associated with the "substandard" classification carried by most impaired loans.

Figure 29: Non-Performing Loans & Provisioning

A: NPLs by Category



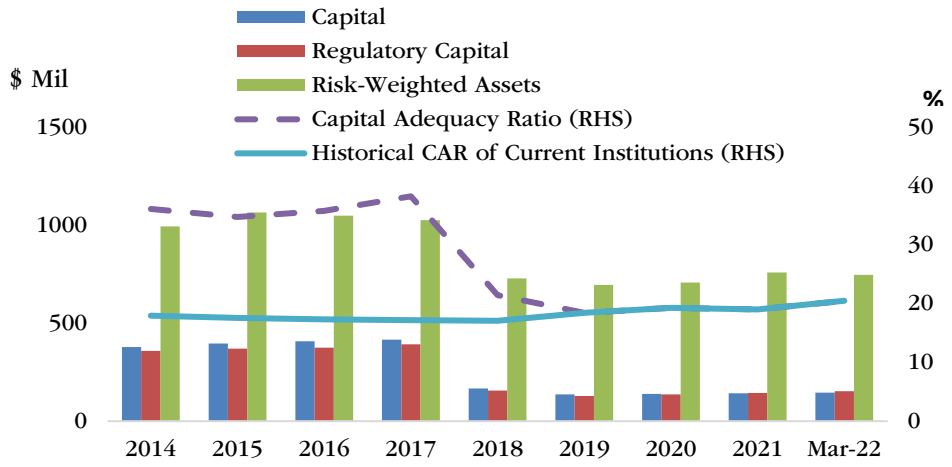
B: Provisions-to-NPLs



Source: Central Bank of Barbados

The sub-sector's CAR improved marginally to 20.5 percent at March 2022, up from 19.5 percent one year earlier (**Figure 30**).

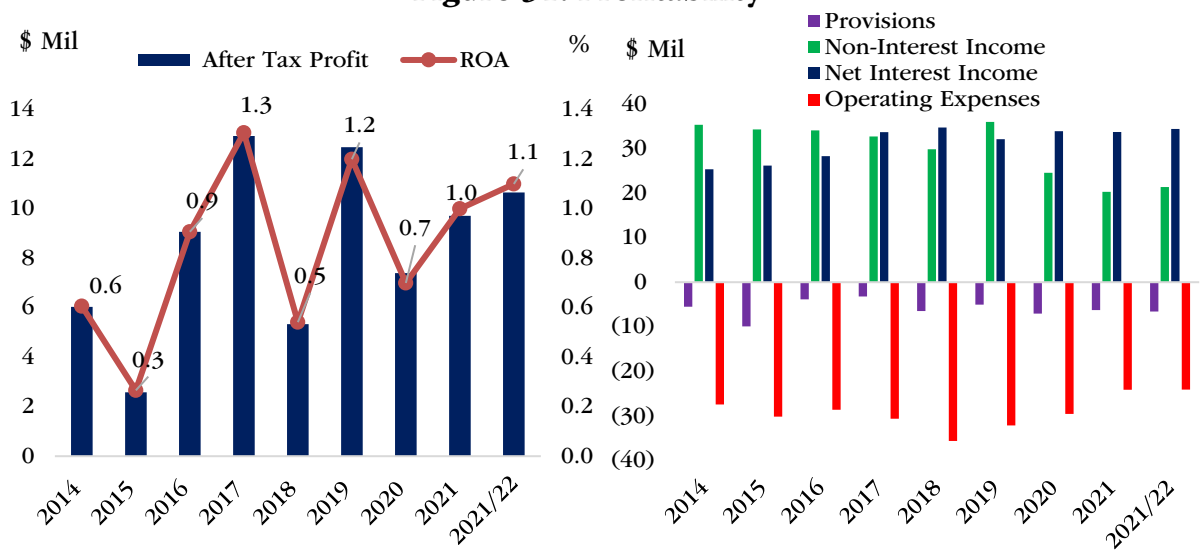
Figure 30: Capital Adequacy



Source: Central Bank of Barbados

The profitability of the sector improved as measured by the return on assets which grew from 0.7 percent to 1.0 percent at December 2021, and 1.1 percent at March 2022 (**Figure 31**). The slightly improved performance was the result of slightly reduced operating expenses and marginal growth in net interest income which combined to outweigh a decline in non-interest income.

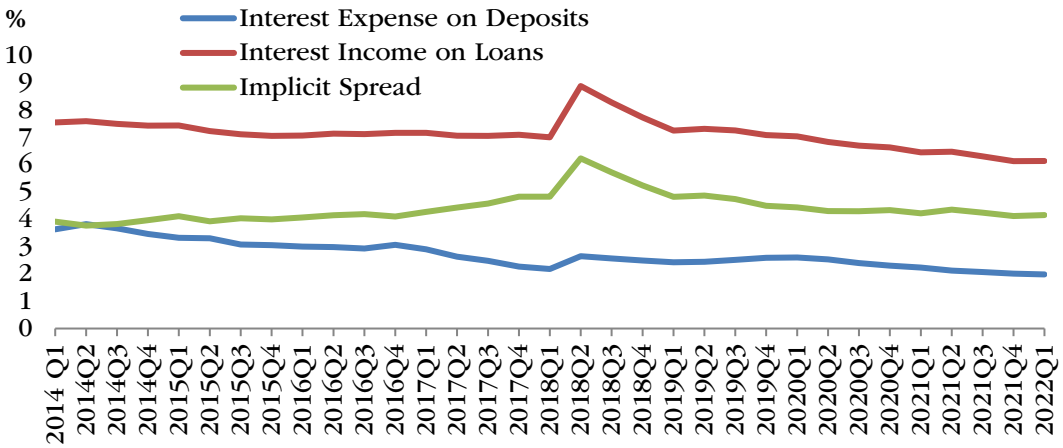
Figure 31: Profitability



Source: Central Bank of Barbados

The effective loan rate continued its gradual decline to 6.2 percent at March 2022, down from 6.5 percent at March 2020 and from 7.1 percent at December 2019. Meanwhile, the effective deposit rate also declined slightly to 2.0 percent at March 2022, down from 2.2 percent one year earlier, in the face of continued high levels of system-wide liquidity **(Figure 32)**.

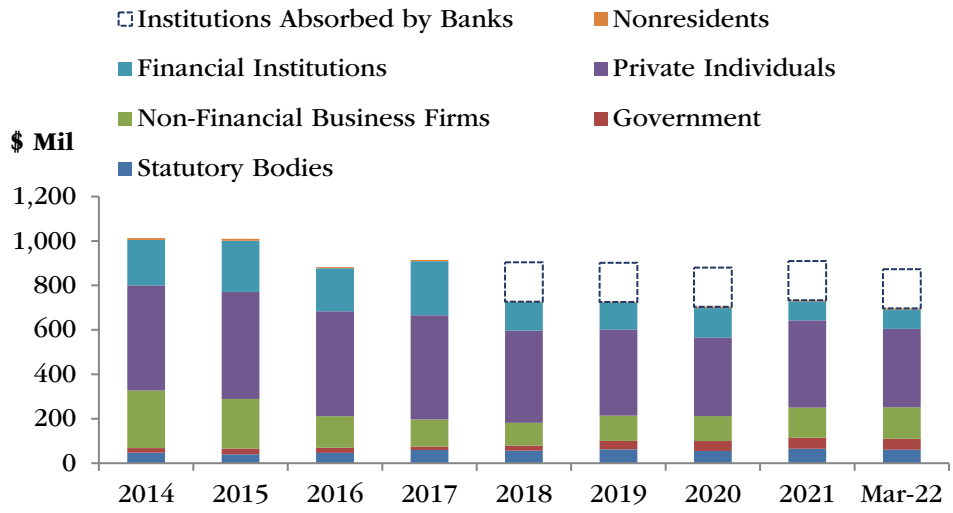
Figure 32: Underlying Implicit Interest Rates



Source: Central Bank of Barbados

Total deposits at finance and trust companies increased by 4.3 percent in 2021 to $733.4 million, then declined 5.1 percent in the first quarter of 2022 to $696.3 million **(Figure 33)**. The growth in 2021 was led by increased deposits of private individuals and non-financial business firms, while the decline for the first quarter of 2022 was driven by a reduction in domestic-currency term deposits of private individuals, as deposit rates continue to slide.

Figure 33: Deposits by Holder



Source: Central Bank of Barbados

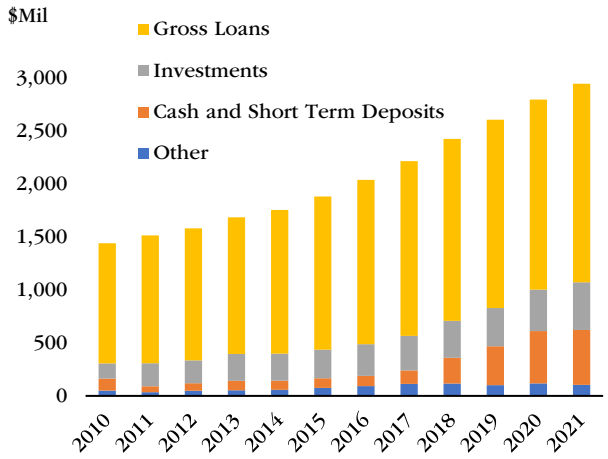
Liquidity indicators for the sector are typically much lower than that of the commercial banks, but finance and trust companies experienced a drawdown in liquidity between August 2021 and February 2022, with one liquidity metric[5] falling from 8.2 percent to 5.1 percent over the period. However, enhanced regulatory monitoring resulted in a rebound in liquidity levels from that point, and liquidity within the sector subsequently increased from March 2022 and over the first half of 2022.

4.3 Credit Unions

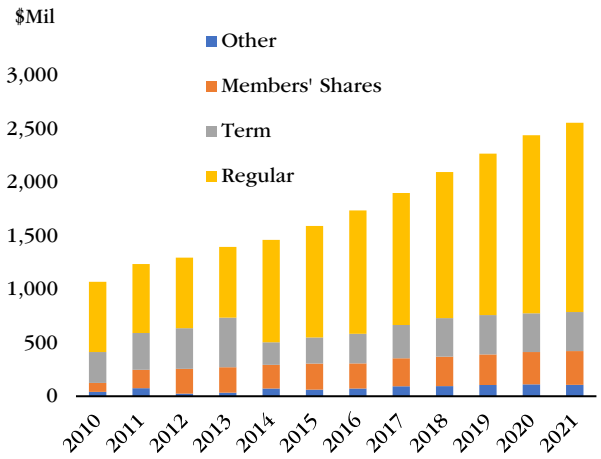
Total assets of the credit union sector grew to $2,942 million, an increase of 5.3 percent, as at December 2021. This was primarily reflected in increases in gross loans which grew by $80 million over the period, to reach $1,872 million. Gross loans remained the largest asset component of the balance sheet, accounting for an estimated 64 percent of total assets at the end of the period **(Figure 34A)**. The sector also continued to experience steady growth in member savings which rose by 4.8 percent **(Figure 34B)**.

Figure 34: Assets & Liabilities

A: Assets of the Credit Union Sector



B: Members' Savings

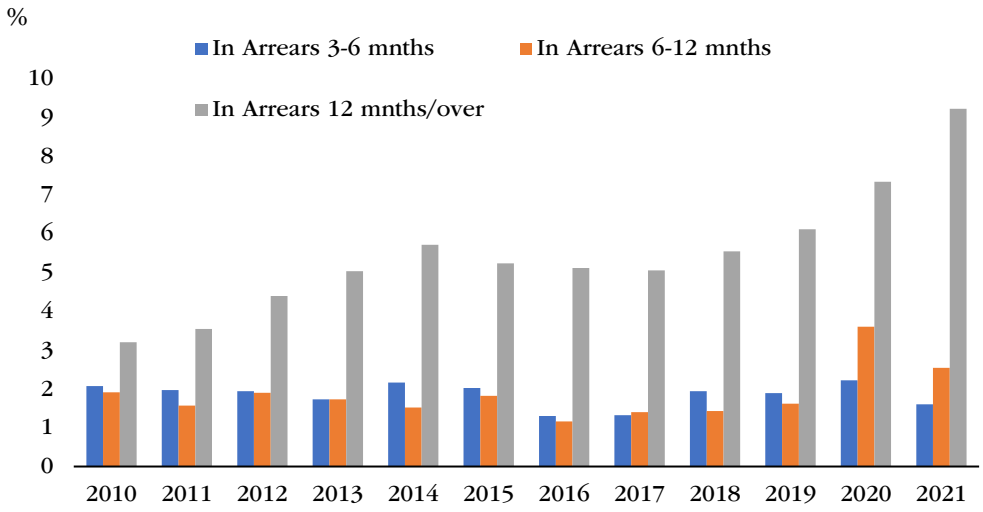


Source: Financial Services Commission

At the end of 2021, non-performing loans made up 12.8 percent of all loans, a drop of 0.4 percentage points from the end of 2020. This downward movement was mostly driven by an improvement in both the 3-6 months and the 6-12 months categories of NPLs as well as an overall increase in the total loan portfolio. The twelve months and over category showed an increase of $34 million, with real estate and collateral-backed mortgages making up most of the category **(Figure 35)**.

[5] The excess liquidity measure used is the the local excess cash and transferable deposit as a percentage of total deposits

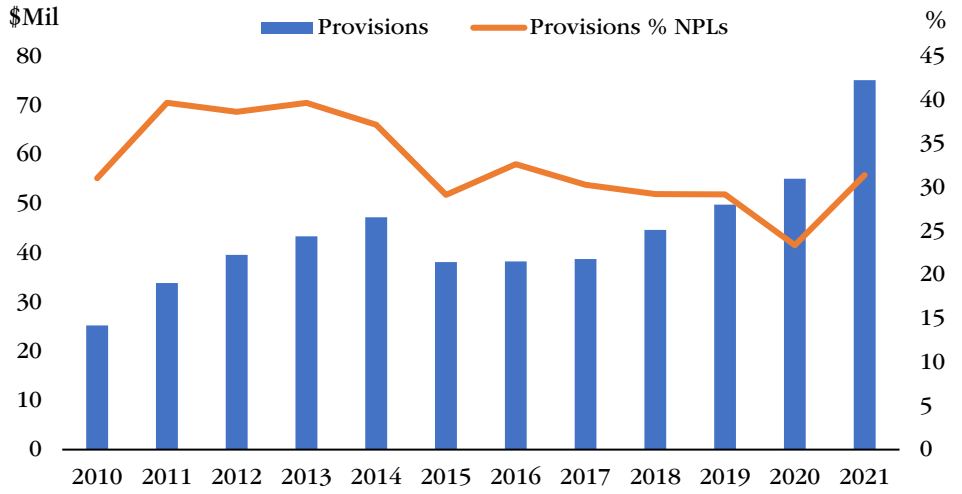
Figure 35: NPLs % of Total Loans



Source: Financial Services Commission

Credit unions continued to adapt to the IFRS 9 standard of provisioning for losses. For the year ended December 2021, the level of provisioning within the sector grew by approximately $20 million, moving the provision to NPLs ratio up to 31.4 percent, as compared to the 23.4 percent recorded last year **(Figure 36)**.

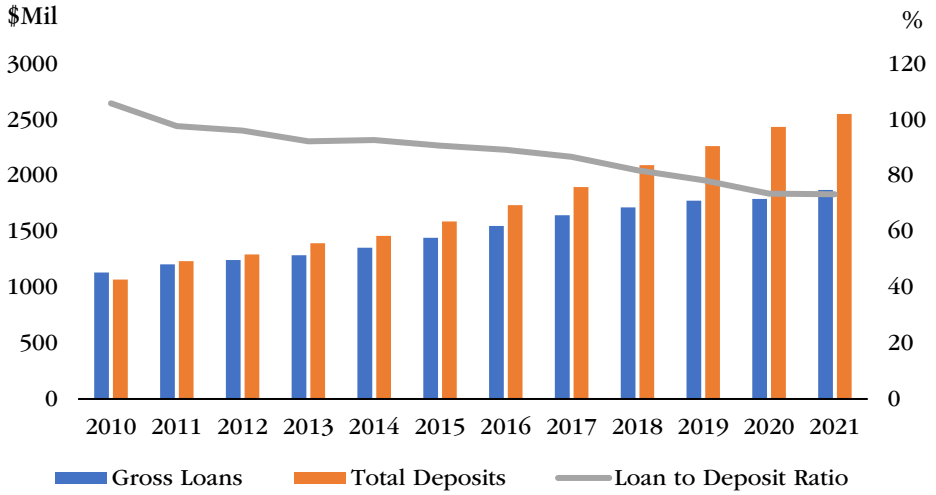
Figure 36: Provisions (% of NPLs)



Source: Financial Services Commission

Since 2010, there has been a steady decline in the loans-to-deposit ratio, as the growth rate of deposits accelerated but in 2021, the ratio remained stable at 73.3 percent **(Figure 37)**.

Figure 37: Loan-to-Deposit Ratio

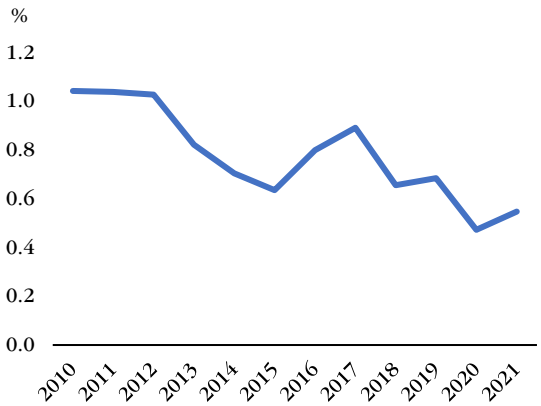


Source: Financial Services Commission

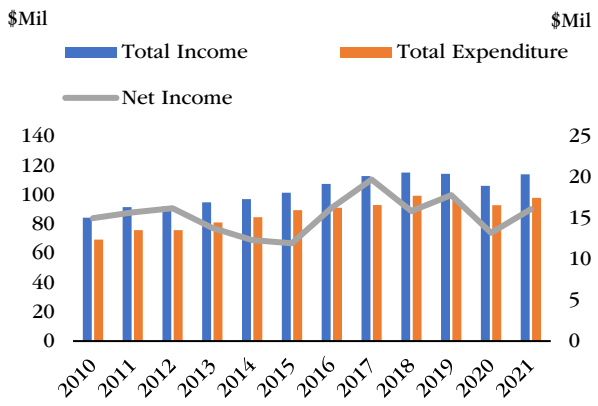
Profitability in the sector increased marginally, with credit unions recording a return on assets of 0.5 percent **(Figure 38A)**. Total income increased by $8 million, reflecting a slight recovery on previously declining loan and investment income. With modest gains in interest and investment earnings and reduced interest expenditures due to lower interest rates, the net income margin reached $114 million at year end **(Figure 38B & Figure 38C))**.

Figure 38: Profitability

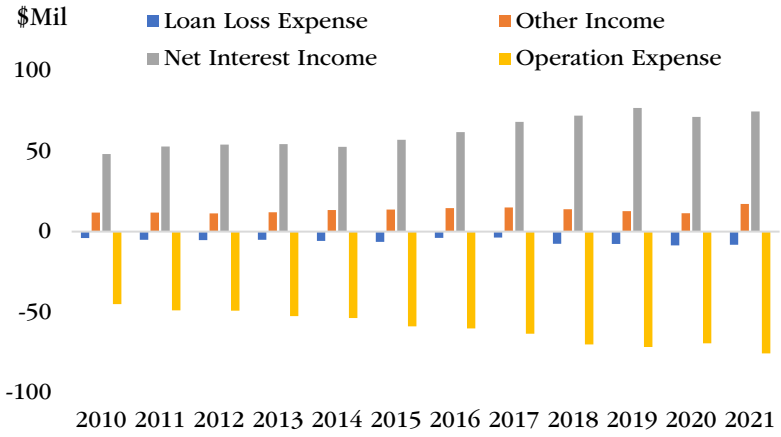
A: Return on Average Assets



B: Net Income



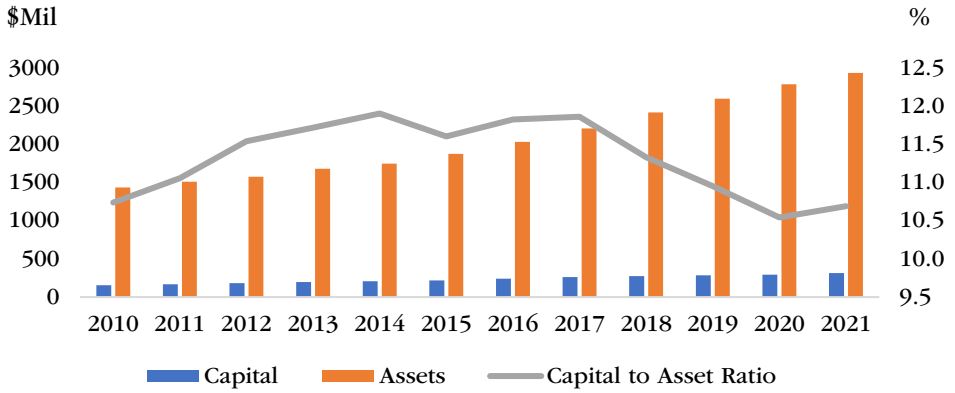
C: Components of Net Income



Source: Financial Services Commission

With the increase in profitability, as at December 2021, the capital-to-assets ratio increased slightly to reach 10.7 percent **(Figure 39)**.

Figure 39: Capital-to-Assets



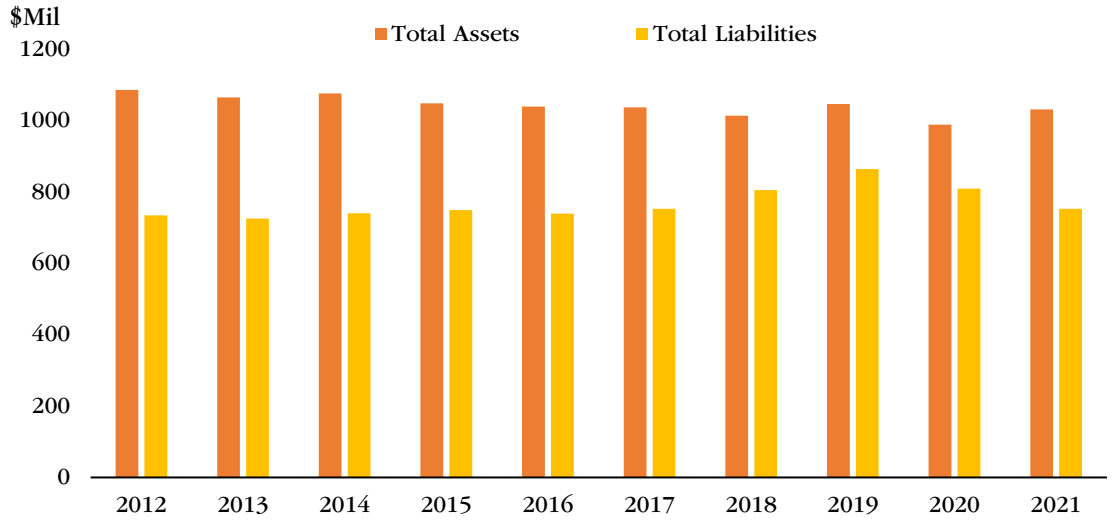
Source: Financial Services Commission

4.4 Insurance Companies

4.4.1 General Insurance Sector

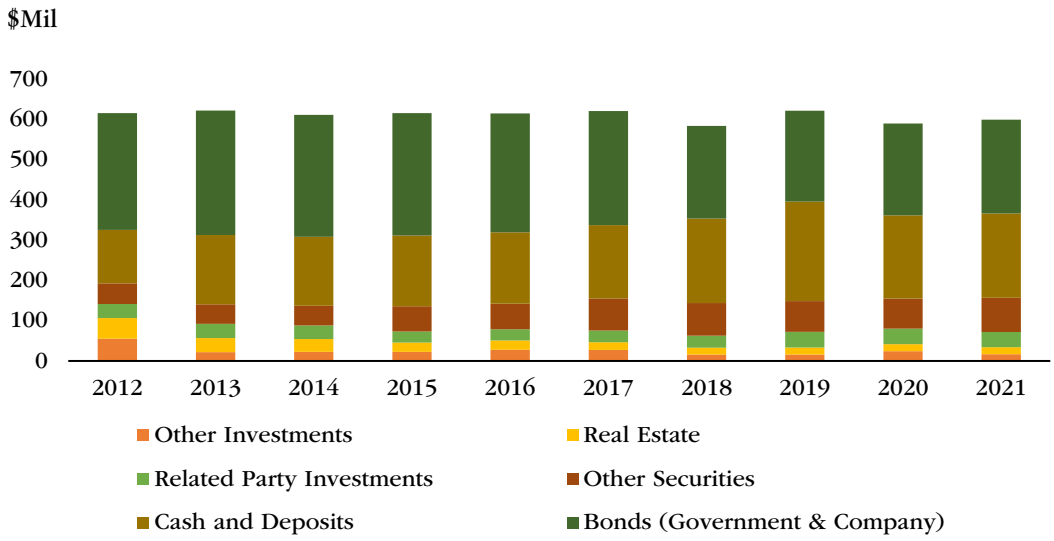
For the year ended December 2021, total assets for the general insurance industry expanded by 4.3 percent to an estimated $1,031 million at year-end. The growth in the asset base is mainly reflected in reinsurance assets and accounts receivable which increased by $25 million and $23 million, respectively. Liabilities incurred by the industry fell by approximately 7 percent, to reach $753 million. This resulted from a $63 million decrease in accounts payable **(Figure 40)**.

Figure 40: Total Assets vs Total Liabilities



Source: Financial Services Commission

Figure 41: Classes of Investments



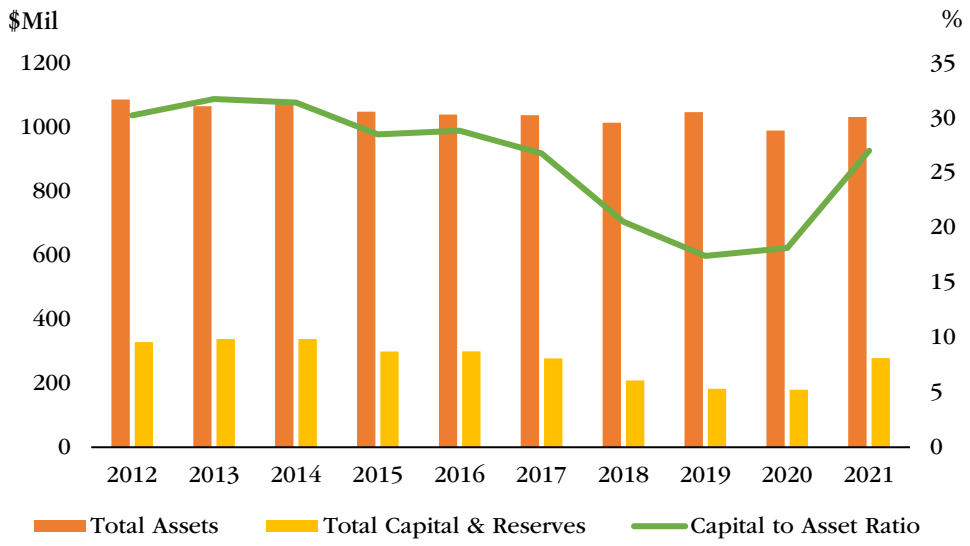
Source: Financial Services Commission

Overall, the investment portfolio for the general insurance industry was estimated to be $600 million, a mere 1.6 percent rise over the preceding year. Bond holdings continue to be the largest component with approximately $233 million worth of investments held, followed by the $210 million in cash and other deposits **(Figure 41)**.

The industry's capital-to-asset ratio was 27 percent at the end of 2021. This ratio reflects an increase of approximately 9 percentage points. This rise is the result of significant increases in returned earnings by two insurers and, as a result, the industry registered an overall of $63 million (28 percent) in retained earnings, relative to the previous year **((Figure 42).**

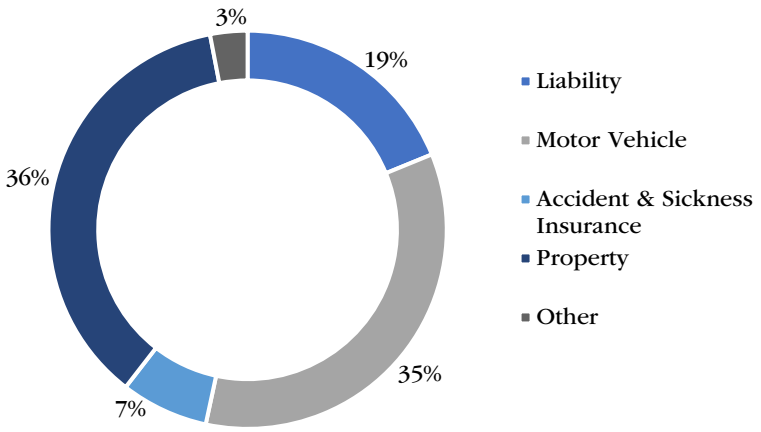
Gross premiums written for non-life insurers increased by 3.9 percent when compared to the comparable period. Similar to past trends, this increase was driven by the property line of business which continues to be the largest and the most heavily reinsured line of business **(Figure 43)**. Motor insurance remained the second largest line of business, but reinsurance ceded for that line of business is not as high as property, given that it is supported by a statutory fund **(Figure 44)**.

Figure 42: Capital-to-Asset Ratio



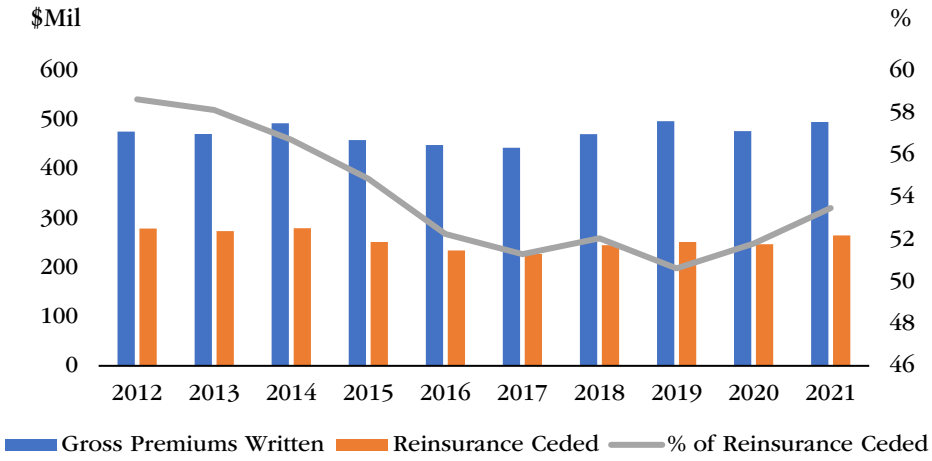
Source: Financial Services Commission

Figure 43: Gross Premiums Written 2021



Source: Financial Services Commission

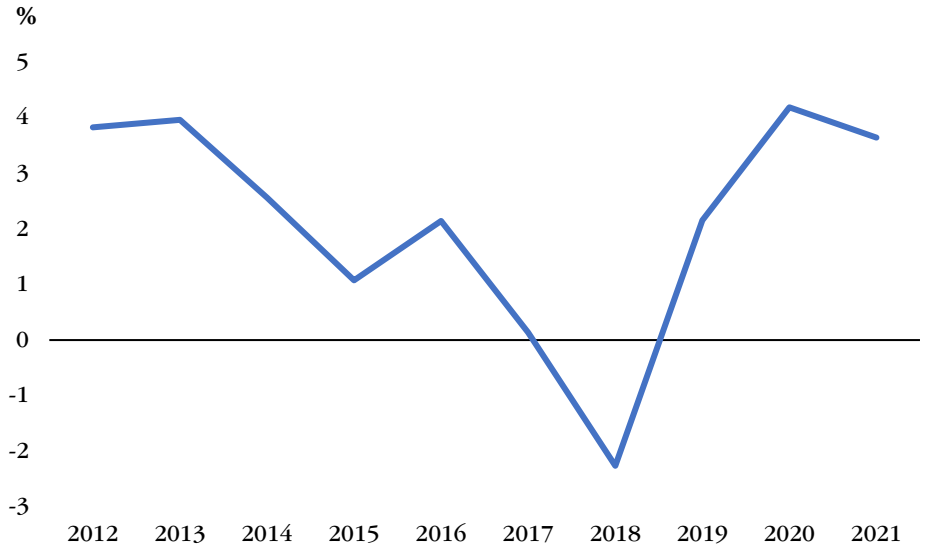
Figure 44: Gross Premiums Written vs Reinsurance Ceded



Source: Financial Services Commission

Net income recorded for the period reached $38 million, with a return on assets of 3.6 percent, 0.5 percentage points below the prior year. This decline in profitability resulted from increased underwriting expenses of approximately 4.8 percent as lines of business such as liability, property and others experienced increases in claims during the period **(Figure 45)**.

Figure 45: Profitability of the General Insurance Sector (ROA)

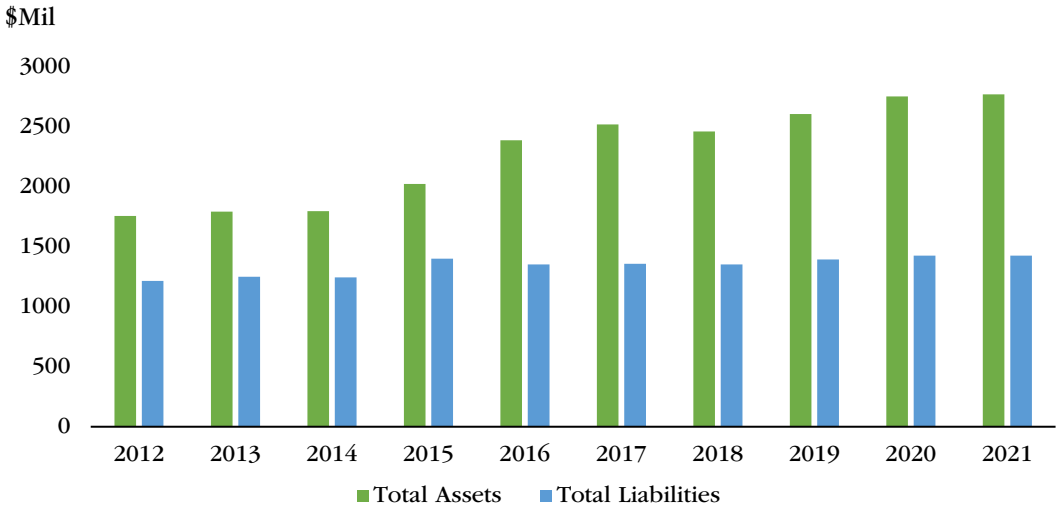


Source: Financial Services Commission

4.4.2 Life Insurance Sector

The asset base of the life insurance industry rose by a marginal 0.6 percent during 2021, compared to the 5.7 percent growth achieved in 2020. At year-end, assets within the industry totalled $2,767 million. Similarly, there was no significant change in liabilities from the previous year, as total liabilities were approximated to be $1,424.0 million **(Figure 46)**.

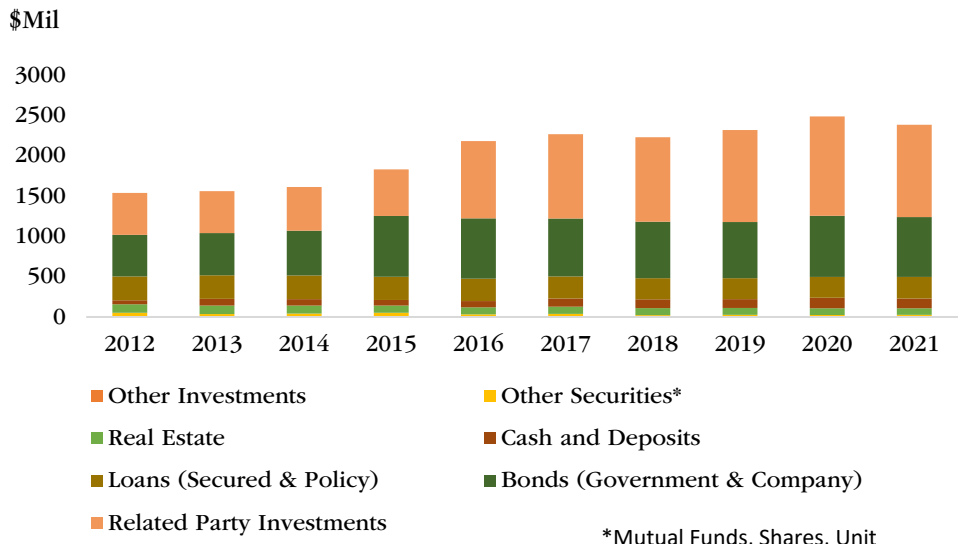
Figure 46: Total Assets vs. Total Liabilities



Source: Financial Services Commission

The investment portfolio continues to account for over 85 percent of the assets held by life insurance companies. This portfolio contracted by approximately $100 million (4.2 percent) as the largest investment category-related party investments - declined by $89 million. However, other assets (accounts receivable, pension fund surplus) rose by $144 million **(Figure 47)**.

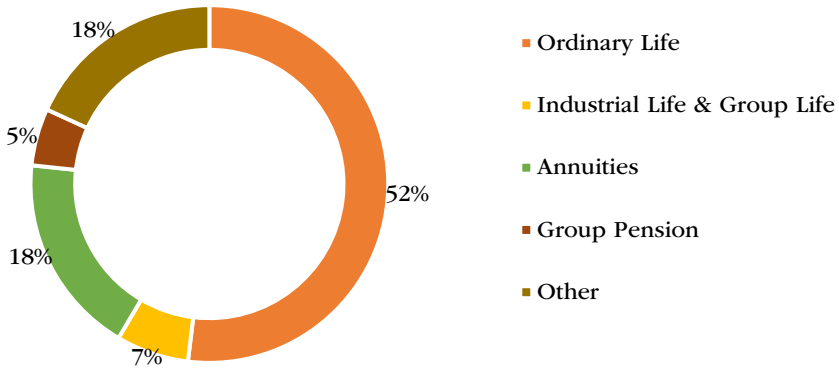
Figure 47: Classes of Investments



Source: Financial Services Commission

Gross premiums written for the industry rose by a modest 1.1 percent. The ordinary life class continued to account for more than 50 percent of the premiums written within the industry and was responsible for almost half of the increased premiums for the year **(Figure 48)**.

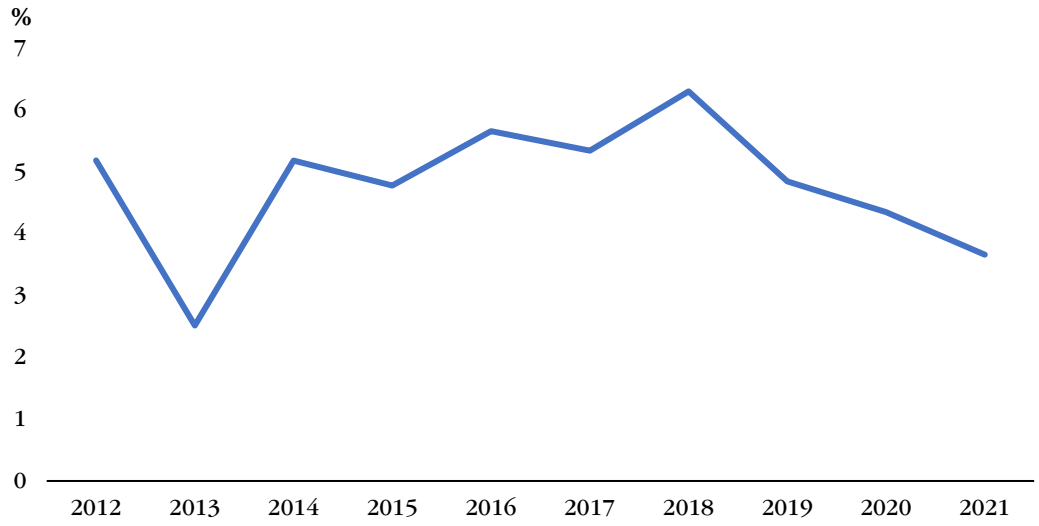
Figure 48: Distribution of Life Insurance Premiums



Source: Financial Services Commission

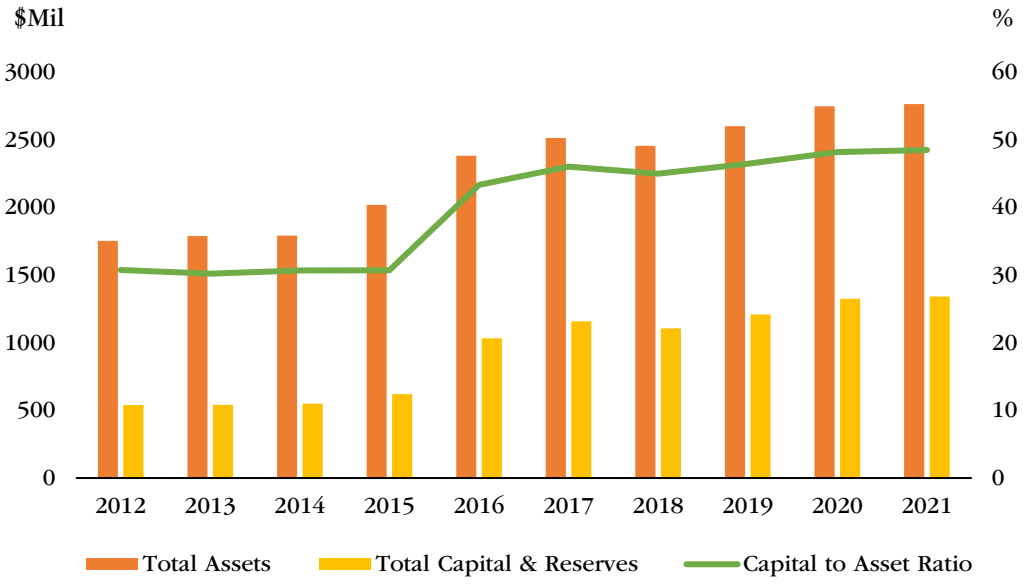
Profitability within the industry declined for the third year in a row reaching $101 million at the end of 2021, a 15.3 percent decline from 2020. The industry faced an increase in policyholder benefits over the review period driven mainly by an increase in policy surrenders valued of almost $24 million. As a result, the return-on-assets measure dipped to 3.7 percent, reflecting a fall of 0.7 percentage points **(Figure 49)**.

Figure 49: Return on Assets for Life Insurers



Source: Financial Services Commission

Figure 50: Capital-to-Asset Ratio



Source: Financial Services Commission

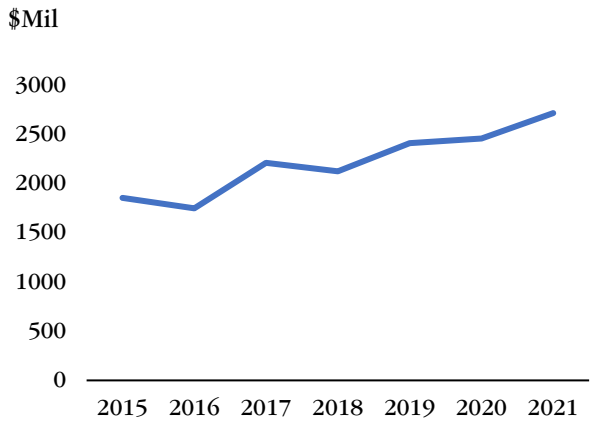
Despite the lower profitability, life insurance companies continued to be highly-capitalised, recording a capital-to-asset ratio of 49 percent, a slight improvement from the 48 percent recorded in 2020 **(Figure 50)**. All entities remained solvent over the period and the industry exceeded the solvency margin by more than 90 percent.

4.5 Mutual Funds

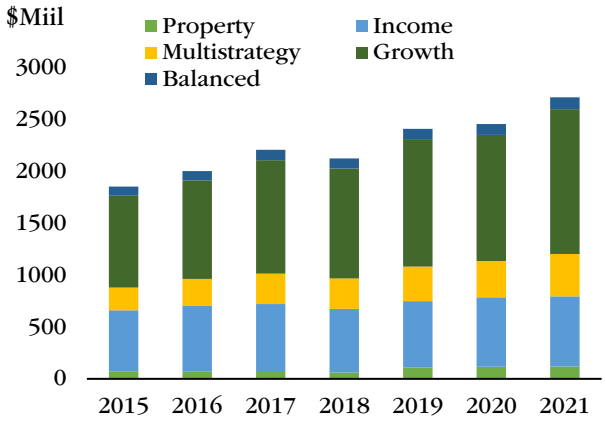
At the end of December 2021, there were 16 mutual funds operating within the domestic sector, comprising 3 property funds, 5 income funds, 1 multi-strategy fund, 5 growth funds and 2 balanced funds. Together, the net assets under management were $2,716 million, reflecting growth of 10.5 percent over the previous year **(Figure 51A)**. The mutual fund market continued to be dominated by growth funds, accounting for more than 50 percent of the net assets within the sector (**Figure 51B**).

Figure 51: Assets

A: Net Assets Under Management



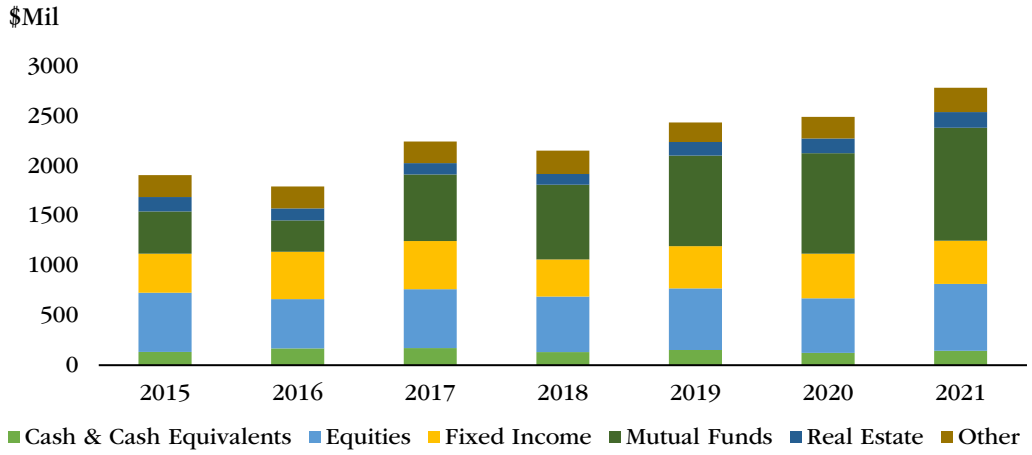
B: Net Assets by Fund Type



Source: Financial Services Commission

Overall, asset growth was reflected in investments in mutual funds and equity securities which expanded by $124 million (12.3 percent) and $123 million (22.4 percent), respectively. In contrast, the sector experienced a contraction in its investments in fixed-income instruments, which fell by $13 million relative to that recorded at the end of 2020 **(Figure 52)**.

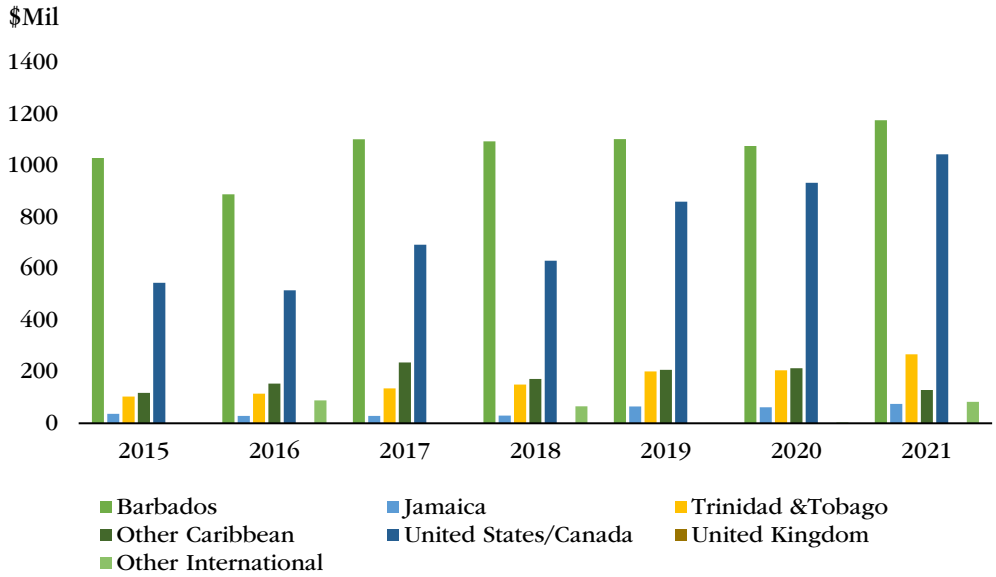
Figure 52: Asset Allocation of Mutual Funds



Source: Financial Services Commission

Most of the assets held by domestic mutual funds remained heavily concentrated within Barbados, accounting for 42.4 percent of total exposure. The second jurisdiction for which the domestic mutual funds have the greatest exposure is that of the United States and Canada, representing 37.6 percent of total exposure **(Figure 53)**.

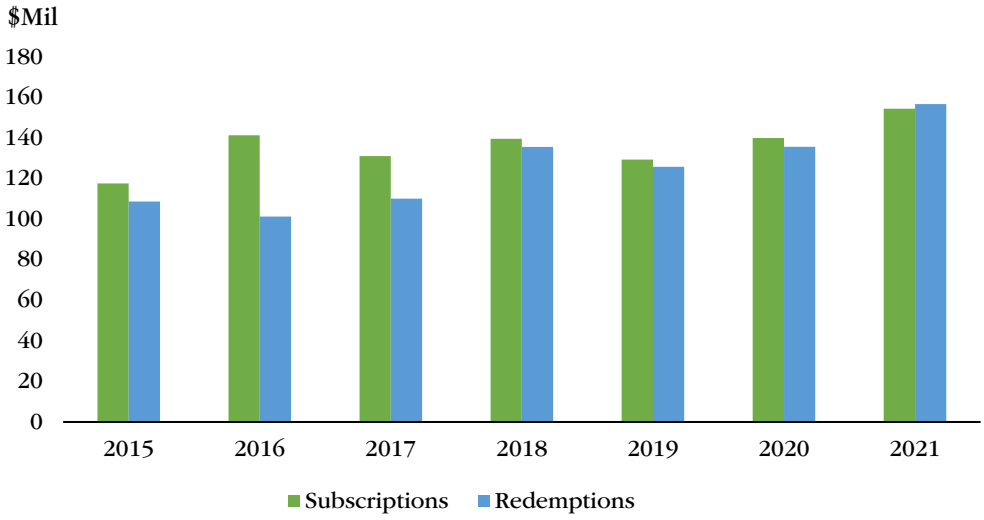
Figure 53: Jurisdictional Exposure



Source: Financial Services Commission

In 2021 total subscriptions to domestic mutual funds amounted to $155 million while the redemptions were $157 million **(Figure 54)**.

Figure 54: Subscriptions/Redemptions for Domestic Mutual Funds



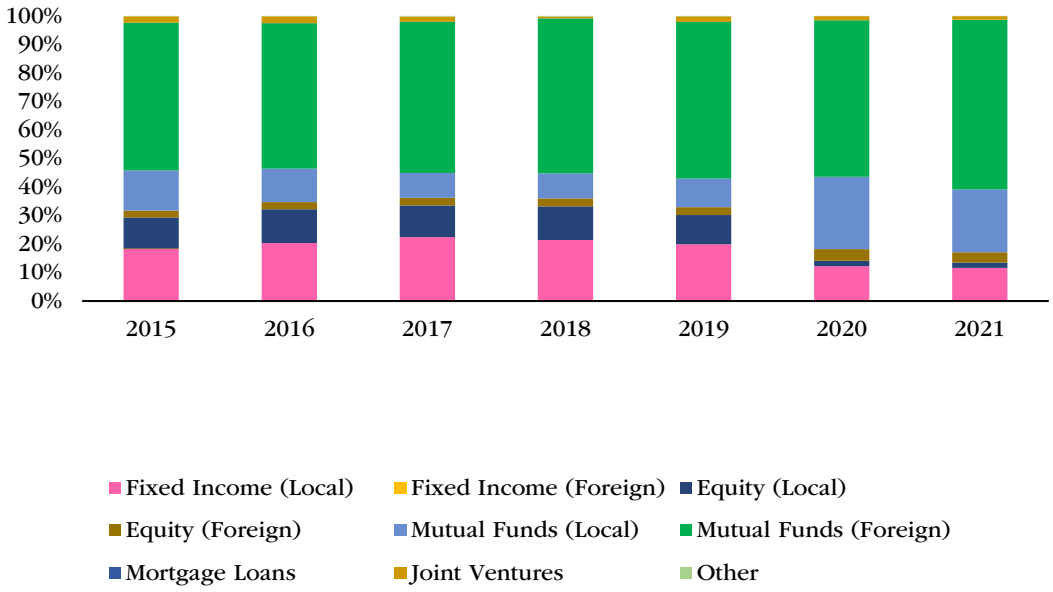
Source: Financial Services Commission

4.6 Occupational Pension Plans

The performance of the occupational pensions sector has improved since being affected by the depressed macroeconomic climate caused by the COVID-19 pandemic, which led to financial losses and the temporary closures for several entities. The industry also continued to function with limited investment opportunities. According to preliminary estimates, assets under management in 2021 were $2,453.0 million, up 14 percent from the previous year, in contrast to the 11 percent decline recorded in 2020.

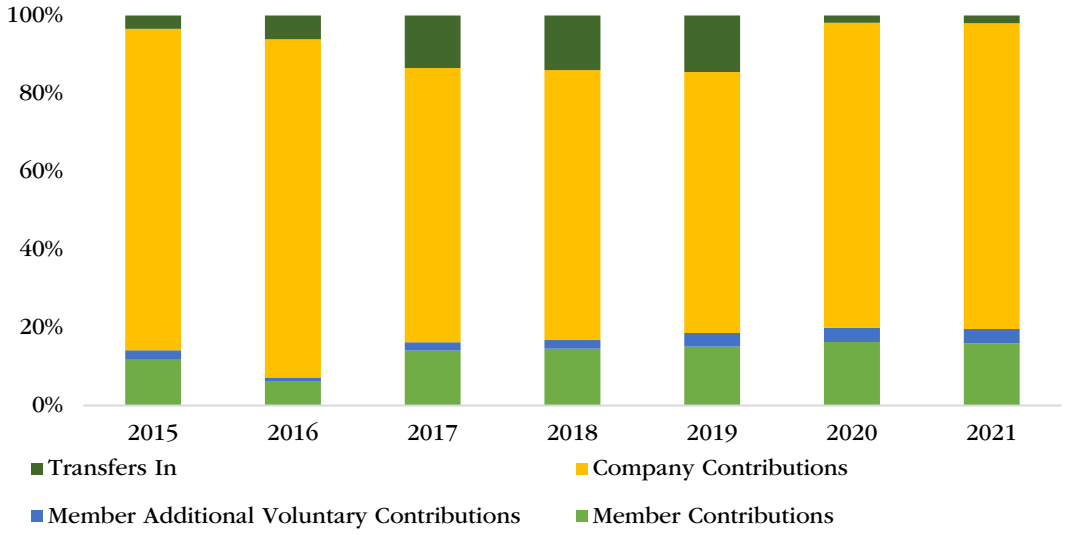
The investment portfolio of the sector showed signs of improvement, with total investments estimated at $2,317 million, a 14.3 percent increase from the previous year and exceeding pre-pandemic levels. Overall growth in the sector benefitted from the performance of mutual fund investments which grew by 16.2 percent. Foreign mutual fund investments continued to dominate the portfolio accounting for 59.5 percent of total investments. Similarly, local mutual fund investments accounted for the second-largest component at 22.1 percent, followed by local fixed-income investments at 11.6 percent **(Figure 55).**

Figure 55: Distribution of Pension Plans Investment Portfolio



Source: Financial Services Commission

Figure 56: Relative Share of Pension Plan Contributions

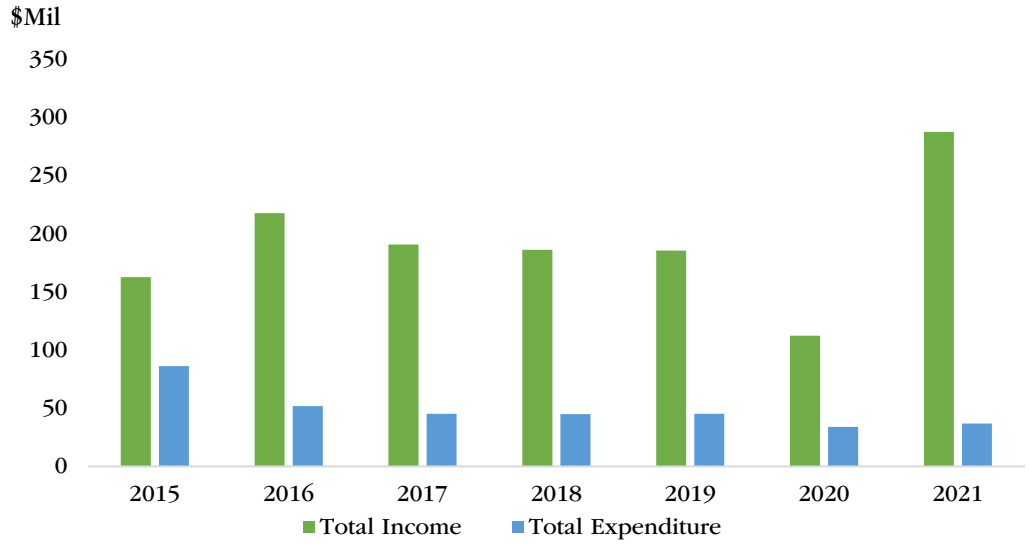


Source: Financial Services Commission

Total contributions in the pension sector continued to fall, contracting by 1.8 percent in 2021. This was primarily driven by declines in both member contributions (3.9 percent) and company contributions (1.6 percent) which can be attributed to the effects of the COVID-19 pandemic, having experienced reduced business activity and elevated levels of unemployment. Company contributions accounted for the largest share of total contributions at $59 million or 78.4 percent

of total contributions. Member contributions accounted for the second-largest share of total contributions at $12 million or 16 percent of total contributions **(Figure 56)**.

Figure 57: Pension Sector Income and Expenditure



Source: Financial Services Commission

The sector's earnings increased by 117 percent to an estimated $244 million at the end of the review period. This increase was primarily driven by local gains on investment which increased by $134 million over the period. Expenditure was approximately $37 million, an increase of 9% over the previous period. Pensions paid were the primary contributor to gains in expenditure increasing by 25 percent over the period of analysis reaching $39 million **(Figure 57).**

5. Stress Testing

5.1 Deposit-taking Institutions

In this section, we explore the potential response of the financial system to macroeconomic and other adverse shocks. Where appropriate, realistic and plausible simulations seek to determine the degree to which existing capital buffers can adequately absorb potential losses and are focused particularly on credit, large exposure, liquidity and interest rate risks. The impact of the shocks is directly transmitted either via the provisions buffer or directly to the institutions' capital. The results are assessed both on an institution-specific and system-wide basis.

5.1.1 Credit Risk

The credit exposure of banks and finance and trust companies is heavily concentrated in the personal sector which accounts for 62 percent of their loan portfolios and 68.2 percent of total NPLs.

With the COVID-19 pandemic seeming to wind down in its detrimental effect on the global and local economies, projections are for a rebound in the country's main economic sectors. However, the threat of the impact of the conflict in the Ukraine on international and local commodity supplies and inflation have already started to impact Barbados. Looking forward, this large proportion of personal borrowers will be affected by inflation arising from fuel and food prices. This could impact the level of NPLs over the coming months or years, depending on the war's duration and intensity. Therefore, the stress testing of credit risk remains a critical tool in assessing potential risk in Barbados' financial system.

Provisioning Shocks

As at March 2021, the pre-shock provisions-to-NPL ratio stood at 53.4 percent, for the combined banks and finance and trust companies, down from 54.3 percent one year earlier. This means that slightly more than half of the industry's impaired loans continue to be covered by provisions. However, at a sub-sector level, the distribution of provisions continued to be uneven, with commercial banks' provisions representing 61 percent of their classified loans (slightly better than 59.3 percent last year), whereas the finance and trust sub-sector covered 26 percent of non-performing loans, down from 28.8 percent in 2021.

Our provision shock assumes no increase in existing NPLs, but increases provisioning on the existing stock of NPLs to 100 percent. The stress tests indicated that the aggregate post-shock capital adequacy ratio (CAR) declined from 17.7 to 16.1 percent for the banks and from 20.6 to 10.3 percent for the deposit-taking finance and trust companies. The more rapid erosion in the trust and finance houses' CARs was due to

their lower provisioning buffers on average, relative to the commercial banking industry. At the institutional level, the CAR of all but one of the five commercial banks remained above the 8 percent regulatory requirement, while two of the three finance and trust companies were severely impacted, with the regulatory capital of one being totally wiped out.

For the credit union sector, the pre-shock rate for provisioning was 31.4 percent and the capital adequacy ratio for the industry was 10.7 percent. The eight (8) largest entities in the sector accounted for approximately 95 percent of total industry assets and three (3) of these entities were found to be below the regulatory benchmark of 10 percent before any shocks were applied. The remaining smaller entities were combined and considered as a single entity.

Assuming no change in current NPLs and a 25 percent increase in the level of provisioning, the capital to assets ratio fell by 6 basis points to reach 10.6 percent, where only the same three (3) credit unions remained below the regulatory minimum of 10 percent. Given the same assumption of no change in NPLs, but a 50% increase in the level of provisioning, the capital adequacy ratio fell by 1.5 percent with four (4) institutions now below the regulatory minimum, as well as the industry. Further increasing the level of provisions on existing NPLS by 75 and 100 percent, the sector was severely impacted as the industry capital to asset ratio fell to 7.3 and 5.4 percent respectively with five (5) credit unions falling below the 10 percent threshold in both instances.

Table 5: CAR Outcomes upon a Proportional Increase in Provisions

Scenario	No. of Credit Unions with CAR < 10%
25% Increase in Provisions	*3*
50% Increase in Provisions	*4*
75% Increase in Provisions	*5*
100% Increase in Provisions	*5*

Source: Financial Services Commission

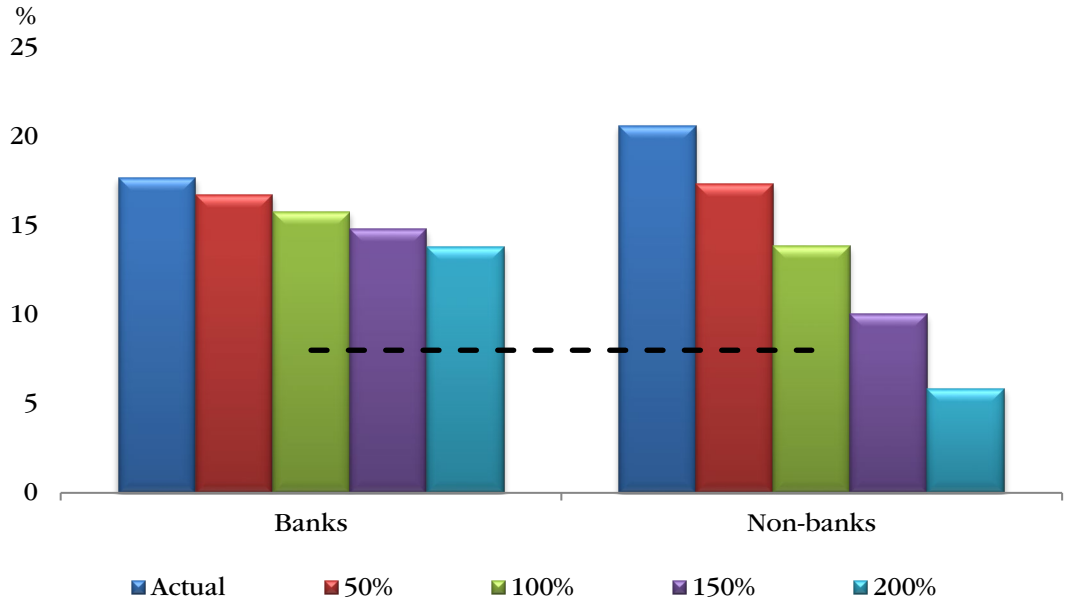
NPL Shocks

The second category of shock in the stress test assessed the impact of 50 percent incremental increases in NPLs on the capital buffers of commercial banks and finance and trusts companies, and 25 percent incremental increases in NPLs on credit unions' capital.

At the subsector level, assuming 50 percent provisions for the new NPLs, commercial banks can withstand up to a 200 percent increase in NPLs, while maintaining an adequate aggregate CAR. With a lower existing provisioning coverage of 26 percent, the finance and trust companies' subsector could withstand the 150 percent increase in NPLs scenario, but fell to 5.9 percent when a 200 percent increase is applied **(Figure 58**). This result is comparable with the last two years' results and reveals no

deterioration after two years of enduring the pandemic and other natural catastrophic events. This suggest that the sector is resilient.

Figure 58: CAR Outcomes from Increasing NPLs



Source: Central Bank of Barbados

At the institutional level, with a 100 percent increase in NPLs one finance and trust company falls below the 8 percent prudential standard, while three institutions (one bank and two finance and trust companies) fail to maintain adequate capital buffers when a 150 percent increase to NPLs is introduced. This is a weaker result relative to last year's where only one bank and one finance and trust company had CAR below 8 percent after a 150 percent increase in NPLs. However, only the same three institutions were affected by the 200 percent increase in NPLs, an improvement over last year's result where two banks and two finance and trust companies fell below 8 percent CAR. **(Table 6)**.

Table 6: CAR Outcomes from Increasing NPLs

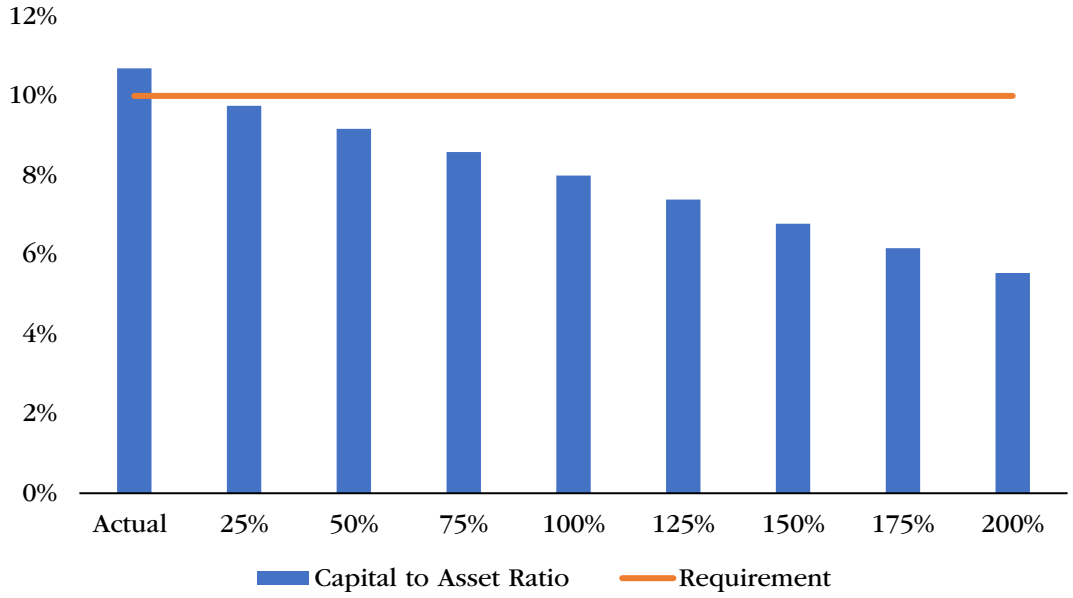
	CAR < 8%	
Scenario	**No. of Banks**	**No. of Finance & Trust**
50% NPL Increase	0	0
100% NPL Increase	0	1
150% NPL Increase	1	2
200% NPL Increase	1	2

Source: Central Bank of Barbados

Given a provisioning level of 31.4 percent for the credit unions, a 25 percent increase in NPLs decreased the capital to assets ratio to 9.8 percent, with four entities now below

the required level, as well as the aggregated industry. As the level of NPLs increased by 50 percent, the capital adequacy ratio fell to 9.2 percent with the same four (4) entities below the required minimum, in addition to the industry. The shocks were further increased in increments of 25 percent, up to and including 200 percent, with the impact on the capital to assets recorded in the following graph.

Figure 59: Impact of 25% Step Increases in NPLs on Capital of Credit Unions



Source: Financial Services Commission

Table 7: CAR outcomes upon a proportional increase in NPLs

Scenario	No. of Credit Unions with CAR < 10%
Baseline	3
25% NPL Increase	4
50% NPL Increase	4
75% NPL Increase	4
100% NPL Increase	5
125% NPL Increase	5
150% NPL Increase	6
175% NPL Increase	6
200% NPL Increase	6

Source: Financial Services Commission

Large Exposures

Assuming that the five largest loans sequentially became non-performing, large exposure tests indicated that the combined commercial banks' and finance and trusts' capital could withstand defaults from their five largest debtors with provisioning requirements up to 50 percent and remain above prudential standards (**Table 8**). However, with 100 percent provisioning, two bank's CAR fell below the 8 percent after round three of the simulation and there was a similar result for rounds four and five. No finance and trust companies failed this test and that represents an improvement over the previous year when one failed in round five. Last year three banks failed in round five. Notably, none of the institutions tested became insolvent even after the total loss of their five largest debtors. This improved large-exposure NPL stress tests result compared to the previous year is again due to a reduction in some of the balances of the largest exposures and stronger capital positions.

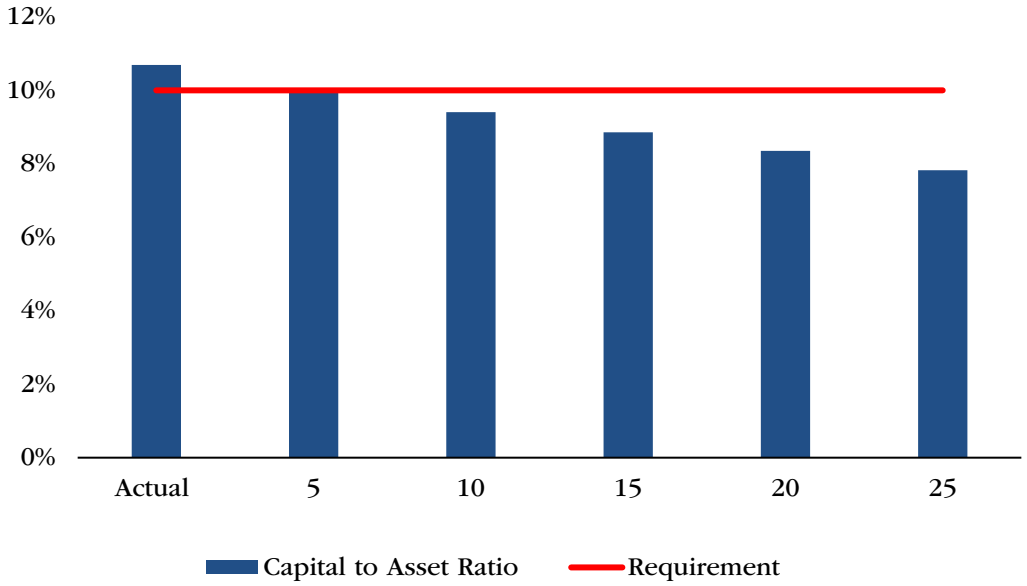
Table 8: CAR Outcomes of Large Exposure Shocks

Scenario	CAR < 8%					
	10% Provisioning		50% Provisioning		100% Provisioning	
	No. of Banks	No. of Finance & Trust	No. of Banks	No. of Finance & Trust	No. of Banks	No. of Finance & Trust
Round 1	0	0	0	0	0	0
Round 2	0	0	0	0	0	0
Round 3	0	0	0	0	2	0
Round 4	0	0	0	0	2	0
Round 5	0	0	0	0	2	0

Source: Central Bank of Barbados

The large exposure test for the credit unions sector was conducted using the top 25 borrowers for each of the eight (8) largest credit unions. With assumed provisioning set at 100 percent, the test was applied in increments of five (5), until all 25 borrowers had defaulted. Following defaults from the top 5 largest borrowers from each credit union, the sector's capital-to-asset ratio fell to 10.0 percent, where 5 entities were found to be below the regulatory requirement. Considering all 25 borrowers, the post-shock capital adequacy ratio was approximately 7.8 percent with seven (7) out of the top eight credit unions falling below the 10 percent threshold.

Figure 60: Impact of Large Exposure default on Capital in Credit Unions Sector



Source: Financial Services Commission

Table 9: CAR outcomes upon Default of Large Exposures

Scenario	No. of Credit Unions with CAR < 10%
Baseline	3
Top 5 Borrowers	5
Top 10 Borrowers	6
Top 15 Borrowers	6
Top 20 Borrowers	6
Top 25 Borrowers	7

Source: Financial Services Commission

5.1.2 Liquidity Risk

The prevailing low deposit rates have substantially removed the distinction between time and demand deposits as the effective penalty for early withdrawal has been reduced. Given the current interest rate dynamics, this liquidity test stresses all categories of deposits equally.

Assuming that 95 percent of all liquid assets were fully convertible to cash on a given day, 5, 10 and 15 percent runs on all domestic-currency deposits (demand and time deposits) accounts were examined (**Table 10**).

Table 10: Results of Deposit Runs: No. of Institutions Requiring Liquidity Support

	At 5%		At 10%		At 15%	
	Banks	*Finance and Trusts*	*Banks*	*Finance and Trusts*	*Banks*	*Finance and Trusts*
Day 1	0	0	0	1	0	1
Day 2	0	1	0	1	0	2
Day 3	0	1	0	2	2	2
Day 4	0	1	0	2	3	2
Day 5	0	2	2	2	4	2

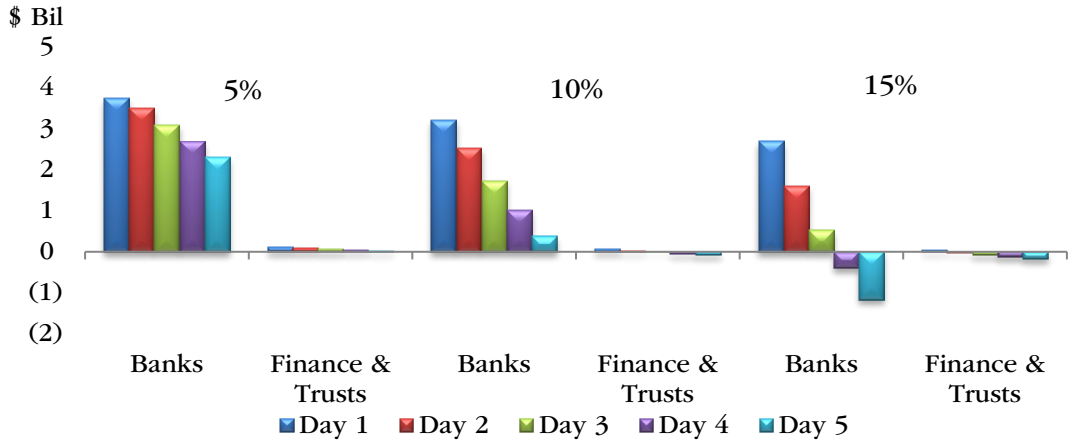
Source: Central Bank of Barbados

With daily five percent deposit runs, no banks required liquidity support for the five days reviewed, while one finance and trust company required liquidity support from the second day, and two on day five.

Using daily ten percent deposit runs, two banks required liquidity support from day five; while one finance and trust company required support from the first day, and two from the third day.

With daily 15 percent runs, two banks required liquidity support from day three, three banks from day four and four banks from day five. Additionally, at 15 percent daily runs, one finance and trust company required support from day one and two from day two (**Figure 61**).

Figure 61: Results of Deposit Runs (Net Cash Flow) March 2022



Source: Central Bank of Barbados

For credit unions, this test was designed to assess the impact of a "run" on members' savings. Assuming that 95 percent of all liquid assets are available each day, 5, 10 and 15 percent runs on both regular and term deposits were examined. Withdrawals on member shares were also fixed at 5 percent per day. Considering a 5 percent run on

member savings, all credit unions were found to be in good standing up until day four when one entity required liquidity support. This held true into day five. With 10 percent runs, one entity had liquidity challenges on day two and this increased to five entities on days four and five. At the 15 percent daily run rate, two credit unions needed liquidity support after day two and by the third day, five entities were found to be experiencing liquidity challenges. By the end of day five, this number increased to six.

Table 11: Credit Unions requiring Liquidity Support upon runs on Members' Savings

	At 5%	At 10%	At 15%
Day 1	0	0	0
Day 2	0	1	2
Day 3	0	1	5
Day 4	1	5	5
Day 5	1	5	6

Source: Financial Services Commission

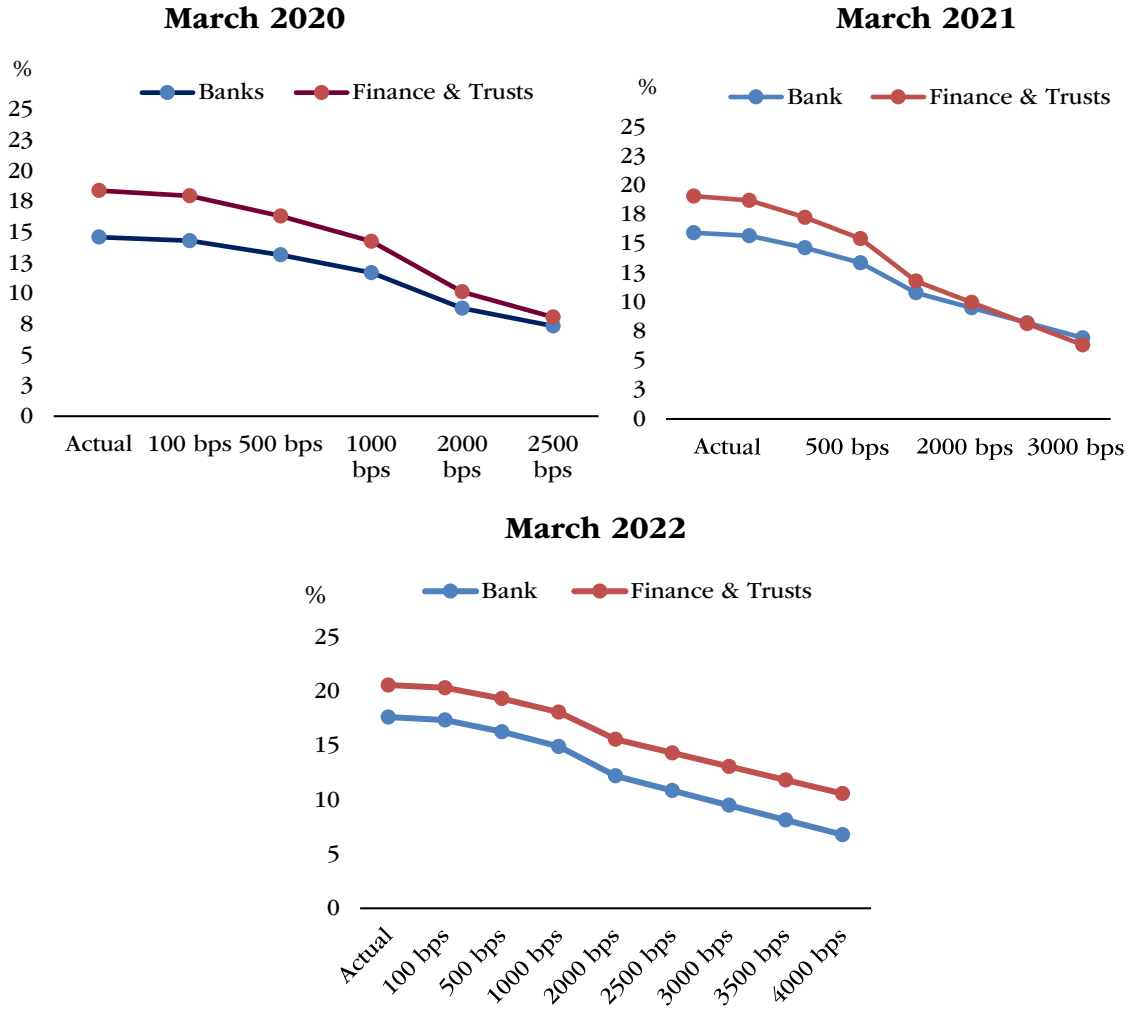
5.1.2 Interest Rate Risk

The short-term maturity gap[6] was used to examine the net impact of rising interest rates on institutions' funding costs and ultimately their profitability, given that the funding structure of depository institutions is typically mismatched in terms of the relative maturities of deposits and loans.

The results revealed the continuation of a positive trend from 2020 to 2021. At the aggregate level, the higher CAR at March 2022 compared to March 2021, made both the banks and finance and trust companies more resilient to interest rate shocks, placing the institutions at a slightly better starting point than one year ago. Whereas, in 2021 they could withstand a deposit rate increase of up to 30 percentage points before the regulatory capital levels were breached **(Figure 62)**, at March 2022, they could withstand an increase of approximately 35 percent. At an institutional level, only under a severe assumption of an increase of 1,000 basis points (10 percentage points), would one bank fail to maintain adequate capital levels, while after 2,000 basis points (20 percentage points), the capital of three banks and one finance company would become impaired.

[6] The maturity gap is the difference between the total market values of interest rate sensitive assets versus interest rate sensitive liabilities that will mature or be repriced over a given range of future dates.

Figure 62: Interest Rate Impact on CAR



Source: Central Bank of Barbados

5.2 Insurance

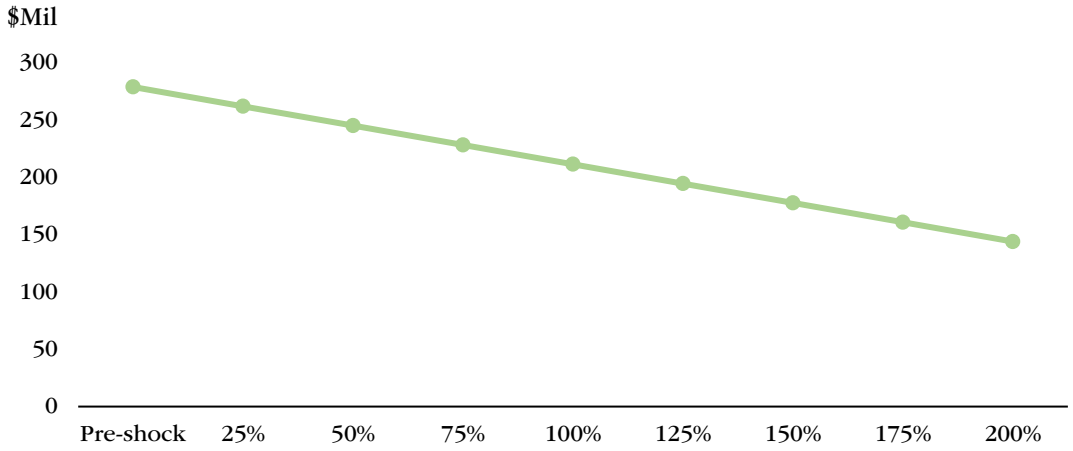
5.2.1 Underwriting Risks

This test was designed to examine the insurance sector's resilience to an increase in claims on all lines of business offered to the Barbadian public. For the general insurance industry, it represents exposure to natural disasters, whereas, for the life insurance industry, the test reflects the possibility of another pandemic. This underwriting risk scenario is, however, a simple test and does not account for reinsurance recoveries. Claims in all lines of business are increased simultaneously by various percentages to examine the effects of this scenario.

General Insurance

All general insurers were deemed solvent at the baseline and remained so even at a 75 percent increase in claims across all categories. With claims increasing by 100 percent, two insurers were found to be insolvent, and the industry's capital-to-asset ratio fell to 22 percent. Four insurance companies were below the solvency requirement at the 125 percent level for increased claims, and this grew to five insurers once all claims increased by 200 percent. At such point, results show that many of the industry players were unable to record profits and the industry's capital adequacy ratio declined further to reach 16 percent.

Figure 63: General Insurers Outcome on Capital after Underwriting Shock



Source: Financial Services Commission

Table 12: No. of Insolvent General Insurers after Underwriting Shock

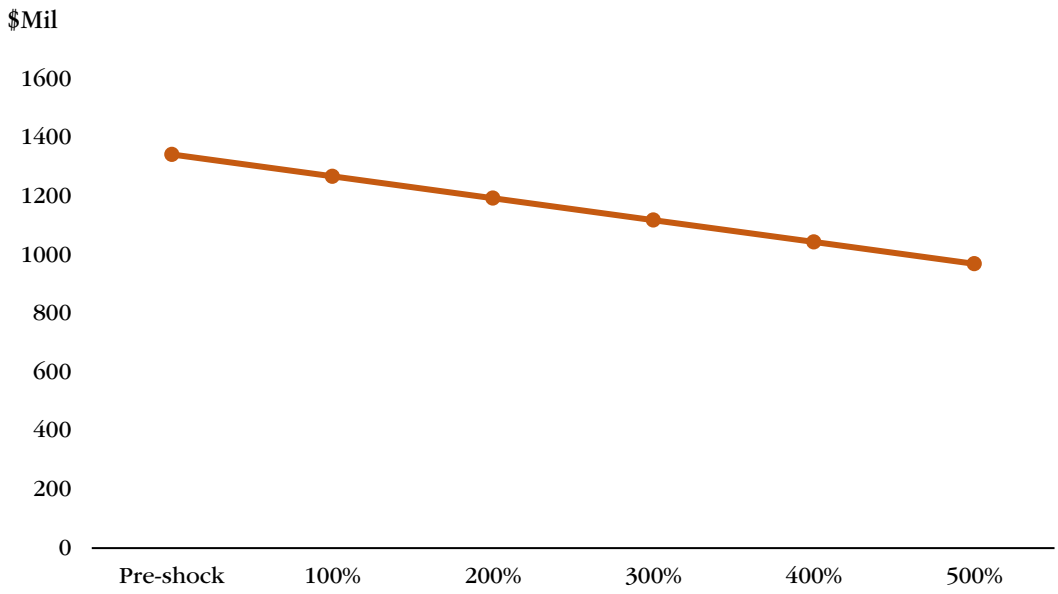
Percentage Increase in Claims	No. of Companies Insolvent
Pre-Shock	0
25%	0
50%	0
75%	0
100%	2
125%	4
150%	4
175%	4
200%	5

Source: Financial Services Commission

Life Insurance

Post-shock results show that all insurers writing life business were in line with the solvency requirement after a 300 percent increase in claims, and the industry's capital-to-asset ratio reduced marginally to reach 44 percent. With further increases in claims to 400 and 500 percent, four companies within the industry recorded net losses and one life insurer was found to be insolvent.

Figure 64: Life Insurers Outcome on Capital after Underwriting Shock



Source: Financial Services Commission

Table 13: No. of Insolvent Life Insurers after Underwriting Shock

Percentage Increase in Claims	No. of Companies Insolvent
Pre-Shock	0
100%	0
200%	0
300%	0
400%	1
500%	1

Source: Financial Services Commission

Applying the underwriting shock to the insurance sector revealed that as claims continued to rise in both industries, the capital positions trended downwards. It is evident that there was no notable erosion of capital levels in either the general or life industries, indicating that the sector remains adequately capitalised.

5.2.2 Economic Downturn

This shock assesses the possible impacts of an economic downturn and how it impedes insurance business domestically. The assumptions employed under this scenario include a downward shift in the yield curve of 300 basis points, a 25 percent drop in real estate values and mortgages, and a 30 percent fall in the value of equity securities.

General Insurance

Following this shock, the industry's capital-to-asset ratio fell to 23 percent, having experienced reductions in both the capital stock and asset base. The industry's profitability deteriorated. Consequently, the industry's capital-to-asset ratio fell to 35 percent. This economic downturn scenario also had an impact on life insurers' profitability, as the value of policyholder pay-outs increased by more than 100 percent, resulting in net losses but no entities were determined to be insolvent.

5.2.3 Multiple Shocks: Pandemic, Economic Downturn and Hurricane

This multi-shock scenario is an extreme case which considers multiple vulnerabilities to the insurance sector all at once. The stressors utilised under this scenario combine the assumptions from the economic downturn scenario with a strengthening of technical provisions, increases in expenses and related party defaults and increased claims of 100 to 150 percent.

General Insurance

Profitability for the general insurance industry was again impaired under this scenario, having recorded net losses. Results show that only one insurer was able to secure a profit as much of the losses overall can be attributed to underwriting expenses which increased by almost 70 percent after the shock was applied. However, only three companies were below the required 25 percent measure of solvency. The industry's capital-to-assets ratio fell to 13 percent in this case.

Life Insurance

Similarly, the life insurance industry recorded a post-shock net loss, where five of the six companies all shared in these losses. Two life insurers were deemed insolvent under this scenario. In addition, related party investments fell, causing a decline in the asset base. Capital within the industry decreased faster, leading to an overall drop in the capital-to-asset ratio to 22 percent.

Table 14: Summary Results for Economic Downturn and Multi-Shock Scenarios

	Baseline Scenario	Economic Downturn Scenario	Multi-Shock Scenario
General Insurance			
Total Assets	1,031.44	1,007.12	906.72
Total Capital	278.69	230.40	118.63
Capital Adequacy Ratio	27%	23%	13%
Net Income	44.83	(4.72)	(123.04)
No. Insolvent Entities	0	0	3
Life Insurance			
Total Assets	2,766.77	2,749.88	2,315.47
Total Capital	1,342.80	970.84	505.24
Capital Adequacy Ratio	49%	35%	22%
Net Income	94.07	(278.54)	(753.64)
No. Insolvent Entities	0	0	2

Source: Financial Services Commission

6. Research Notes

Climate Change and the Financial Sector

Author: Anton Belgrave[1]

According to the sixth Intergovernmental Panel on Climate Change (IPCC (2018)), the average global surface temperature has risen by approximately 1°C since the late 19th century, with the pace of increase since 1970 being faster than in any other 50-year period over the previous 2,000 years. Even in the best-case scenario of immediate, rapid and significant cuts in greenhouse gas (GHG) emissions, the average surface temperature is expected to increase in the next 20 years by 1.5°C relative to pre-industrial levels.

Reaching net zero – the neutralisation of all man-made GHG emissions through offsetting measures - by 2050, has been described as the grand challenge of our time. Limiting the rise in global temperatures to 1.5°C requires nothing short of a total transformation of the energy systems that underpin our economies, requiring an estimated annual investment of US $4 trillion by 2030 (IEA (2021)). Achieving this objective will have significant implications for the financial system, and the regulators who aspire to influence its growth and stability.

Climate Change Risks

An emerging taxonomy has broadly divided the risk associated with climate change into:

(1) "physical risk" (i.e., damages to facilities, operations, and assets caused by climate change-induced hazards and conditions); and

(2) "transition risk" (i.e., losses resulting from a transition of production and consumption towards methods and products that are compatible with a net-zero economy).

Transition risk can also be divided into three subcategories:

a. Policy risk which refers to the risk that policies associated with the transition to a lower- emissions economy may raise costs, induce shifts in the location and nature of economic activity, and impose restrictions that affect the viability or profitability of certain industries.

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b. Technological risk through which certain assets may suffer a fall in value due to technological obsolescence, and become "stranded[2]".

c. Preference risk which refers to risks arising from shifts in investor and consumer preferences away from carbon-intensive products toward greener ones.

From a regional perspective, the physical risks are clear for small Caribbean economies, with the expected intensification in hurricanes and increasing possibility of long-term droughts. However, transition risks are equally important, even though large-scale extractive industries such as oil and gas, which are expected to suffer most, are not currently a feature of most Caribbean countries[2]. For example, de-carbonisation efforts may affect tourism-based Caribbean nations as airlines attempt to reduce their carbon footprint.

Financial Sector Risks

Physical and transition risks are likely to manifest themselves as traditional bank risks such as credit risk, market risk, liquidity risk and operational risks rise.

Since banks and other financial firms significantly influence resource allocation across the economy through their intermediation function, their strategic decisions could determine whether the transition to a sustainable economy succeeds or fails. For example, high leverage may inadvertently provide too much funding to "non-green" institutions. In turn, continued emissions by those companies may further increase uncertainty about future climate pathways, since each additional ton of carbon emitted into the atmosphere further warms the planet and alters the climate.

If losses related to physical risk factors are insured, they can directly affect insurance firms through higher claims. Since the 1980s, the number of registered weather-related loss events has tripled. Inflation-adjusted insurance losses have increased from an annual average of around $10 billion in the 1980s, to around $55 billion over the past decade (BOE, (2018)). However, even if losses are insured, the burden can fall on households and companies, impairing asset values and reducing the value of loan collateral/security of banks and other lending institutions. General insurance contracts are usually written on a one-year basis and are frequently re-priced. Already, there are examples of private insurance cover being withdrawn, negatively impacting property values. Furthermore, the Bank of England has reported that representatives from the insurance sector have warned that a +4°C world would not be insurable (BOE (2018)).

[2] Stranded assets are those that lose value or turn into liabilities before the end of their expected economic life.

Risk Management

To address climate-related financial risks within the banking sector, the Basel Committee on Banking Supervision (BCBS) established a Task Force on Climate-related Financial Risks in 2020 which has drawn up a principles-based approach to improving risk management and supervisory practices related to climate-related financial risks (BCSB (2020)). These eighteen principles encompass climate-related risk mitigation by ensuring:

i. significantly improved board oversight and the explicit assignment of responsibility;
ii. the incorporation of climate risk into capital and liquidity assessment;
iii. the inclusion of the impact of climate risk drivers on credit risk profiles; and
iv. the incorporation of scenario analysis by firms to test their business models.

The principles also recommend an enhanced role for regulators in terms of requiring banks to incorporate material climate-related financial risks into their business strategies, undertaking supervisory assessments of climate-related financial risks, and using climate-related stress tests.

In addition to the Basel recommendations, in May 2020 the Network for Greening the Financial System (NGFS) published a *Guide for Supervisors* to help integrate climate-related and environmental risks into regular, prudential and supervisory activities (NGFS (2020)). The NGFS Guide made five recommendations to supervisors and provided detailed guidance and examples on how to embed climate-related and environmental risks within a supervisory organisation through dedicated structures, describing several operational models that remain relevant.

However, Coelho and Restoy (2022) noted that despite the guidance provided by Basel, the challenges remain significant, leading to questions about the role and effective impact of regulatory guidance on the climate transition. In particular, Basel pillar 1 capital requirements are calibrated for a one-year time horizon on the basis of the historical loss experience. For climate-related financial risks, however, the historical loss experience is not available, and a more forward-looking approach is required.

Coelho and Restoy further note that Pillar 2 offers more scope for dealing with climate-related financial risks. Within the supervisory review processes, authorities have a wider variety of capital and non-capital-based tools that might be deployed to ensure the effective management of climate-related financial risks. For example, supervisors could use their assessments of firms' exposures to climate-related financial risks to seek, within a reasonable period of time, enhancements that ensure that firms properly identify, monitor, measure and control such risks.

In addition, these authors have argued that the actual effectiveness of prudential tools to steer banks' credit policies is uncertain, at best. Some empirical evidence shows that changes in capital requirements have little impact on banks' investment policies unless they are calibrated at a very high level. More importantly, macroprudential measures aimed at reducing exposures to carbon-intensive firms and sectors may not always be conducive to reducing aggregate climate-related financial risks. In particular, a significant increase in capital requirements for exposures to companies that are deemed high carbon emitters (brown exposures), will likely limit the availability and affordability of credit to carbon-intensive industries, thus hindering affected firms from adjusting their business models due to constrained financial resources.

Similarly, a green-supporting factor, one that alleviates prudential requirements for green exposures, is unlikely to contribute to financial stability policy objectives. A reduction in capital requirements for green assets would cause a break in the fundamental relationship between risks and capital requirements as there is no conclusive evidence that green investments are less risky than other exposures.

Analysis by Chamberlin and Evian (2021) of French banks also support the limited effectiveness of differential capital requirements to drive desired climate outcomes. They firstly note that the while a "green supporting factor (GSF)" is supported by the banking industry, the risk differential between "green" and "normal" assets has not been demonstrated. More worryingly, these authors found that the even when applied, the GSF would have only a marginal impact on the cost of the loan, with the value of other public support measures 15 to 25 times greater than the GSF.

In contrast, transition risk provides regulators with a theoretical basis for penalising high-carbon-generating activities in the banks' capital structures. However, to have an impact on the cost of the project, Chamberlain et al (2021) note that the calibration must be extremely high. For example, a 250 percent increase in capital requirements would increase the cost of some harmful projects by 10 percent. In view of their results, they advocate the development and exploration of other prudential options.

Analysis by Dafermos and Nikolaidi (2021) on differentiated capital requirements is more positive. In their model, a green supporting factor means that a bank needs to hold less capital for loans provided to support activities that can lead to the reduction of carbon emissions. Conversely, a dirty-penalising factor is applied whereby banks hold more capital against loans that finance high carbon activities. These authors found that differential capital can reduce the pace of global warming, thereby decreasing physical financial risks. However, they also note that this reduction is quantitatively small, but enhanced when used in combination with a green fiscal policy. Interestingly they also found that fiscal policies that boost green investments, amplify the transmission risks of green supporting factors and reduce the transmission risks of the

dirty-penalising factor, thereby producing an effective climate policy mix from a financial stability point of view.

Challenges

The assessment of climate related financial risks requires new, unique, and granular data. This data is, at best, only partially available, even in developed economies. For example, it is challenging to aggregate data on firms and emissions in a straightforward way since data collection is often sparse and incomplete. Standardising global climate disclosures may help address some of these data challenges.

Climate change-related features are likely to become more salient and possibly amplify financial system vulnerabilities. For example, climate-related risks may increase the correlation of shocks and therefore the aggregate exposures of financial institutions in ways that are extremely challenging to model.

Given that historical data may have limited relevance for predicting future climate states, financial institutions have little historical guidance on which to base projections, suggesting that existing risk management models and frameworks may leave them inadequately prepared for climate-related risks. Nonlinear effects may further complicate efforts to mitigate and model climate related risks, as tipping points are difficult to predict.

Nonetheless, this has not stopped attempts at modelling. As noted by the NGFS (2021), most NGFS members are conducting climate scenario analysis for the first time, and many view the development of awareness and capabilities on climate-related risk as being as important as the quantification of the risks themselves. The exercise itself is resource intensive, requires significant upskilling among central bank staff, and practitioners report broad collaborative efforts are necessary with external parties such as metrological and academic institutions, external modelling teams and data providers, other central banks and international organisations. The way forward probably entails combining agent-based models, general equilibrium models, and statistical methods which would then be used in conjunction with stress tests. However, despite the sophistication of these approaches, the limitations noted previously suggest that considerable margins of error should be attached to any analysis around climate impacts.

Nevertheless, the scale of the problem suggests even imperfect efforts will need to be undertaken. In September 2021, the European Central Bank released the results of its economy-wide climate stress test (ECB (2021)) which found that:

a. early adaptation costs are significantly lower than the medium- and long-term costs of inaction;

b. physical risks increase non-linearly over time and are expected to become very significant and;

c. costs stemming from climate-related risks are moderate for the average firm and bank.
d. However, if climate change is not mitigated, large and significant institutions, select geographic locations (such as southern Europe), and certain industries would bear significant costs, possibly leading to systemic events.

Similarly, Fernando et al (2021) find that even under a representative pathway with modest concentration increases in carbon dioxide, the GDP losses are around 3.2% of GDP by 2050. They note that costs could be amplified if financial markets re-price climate-related risks with additional losses between 0.5 percent to 1.5 percent per year for all countries except Russia, which experiences larger GDP losses across all scenarios by 2030.

Conclusion

At this stage, the evidence that a macroprudential framework can be constructed which is capable of containing systemic climate-related financial risks is tentative. First, the micro and macroprudential prudential regime, including the stress tests and scenario analyses embedded in the Pillar 2 framework, seems to be a more suitable approach to ensuring that banks have sufficient loss-absorbing capacity against systemic climate-related financial risks. Second, the literature indicates that the application of tools such as increasing capital requirements for brown exposures or alleviating these requirements for green exposures seem to be modestly effective, would need to be applied globally, and may need to be applied at politically unpalatable levels to contribute to financial stability. Fiscal policy in the form of carbon taxation appears likely to play a complementary role to differential capital requirements and other macroprudential tools, and should at least be defensible in democratic regimes.

However, given the accelerating nature of developments in this area, financial institutions and regulators need to look carefully at their individual climate frameworks and begin to incorporate these frameworks into day-to-day business practices in as timely a fashion as possible, given the significant uncertainty in this area.

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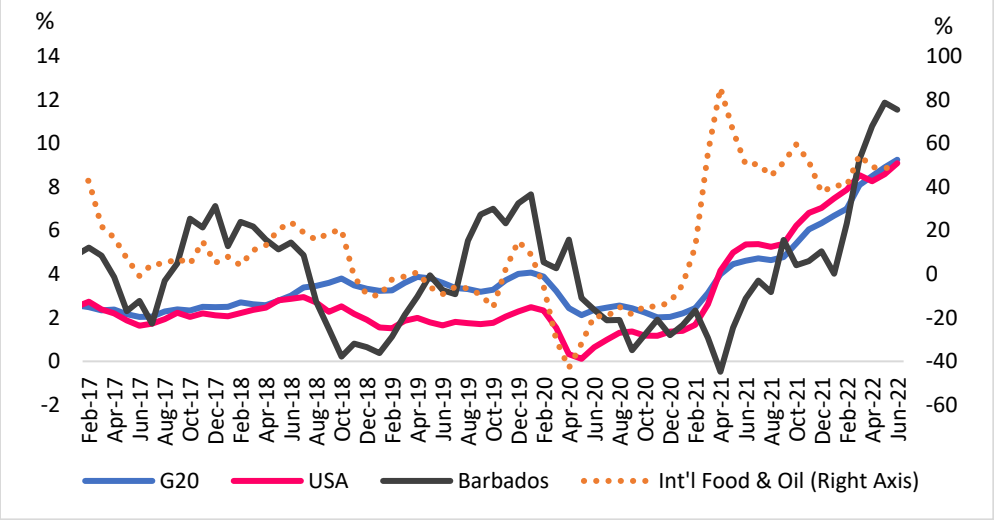
The Relationship Between Inflation and Financial Stability

Author: Carlon Walkes[1]

Inflation is a general increase in prices of goods and services within an economy, and the inflation rate measures the percentage change in the average price of goods and services over a specified period of time. Ultimately, inflation reduces the purchasing power of money such that one unit of money buys fewer goods and services than it did previously. Inflation, therefore, increases the operating costs of businesses and the cost of living for individuals.

The Russia-Ukraine conflict further exacerbated the global inflationary pressures that had been mounting since 2021 as a result of supply chain disruptions and a rebound in demand following the easing of COVID-19 protocols worldwide. Figure 1 shows that the rate of point-to-point inflation for the G20 rose from 4.6 percent in June 2021 to 9.2 percent in June 2022, as the average of international food and crude oil prices surged by 48.4 percent over the same 12-month period. The USA, the largest G20 country and Barbados' top merchandise trading partner, experienced an increase in consumer prices of 9.1 percent for the month of June 2022 relative to 5.4 percent one year earlier. In line with the fact that Barbados is a highly import-dependent small economy, its inflation jumped 8.6 percentage points to 11.5 percent in June 2022 from what it was a year ago.

Figure 1: Point-to-Point Inflation Rates, January 2017 – June 2022



Sources: IMF, OECD, Central Bank of Barbados, Author's Calculations

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Table 1 shows a notable rise in average consumer prices of Canada, Japan, the United Kingdom, the United States of America and the majority of the larger CARICOM countries during the year ended June 2022. The table also indicates that Barbados' major trading partners for goods include three CARICOM nations: Trinidad and Tobago, second largest market for both imports and exports, as well as Jamaica and Guyana, the third and fourth largest export markets. Of the countries sampled, the three highest inflation rates as at June 2022 were registered by Suriname[2], Barbados and Jamaica. The countries with the fastest acceleration of inflation relative to the corresponding period of 2021 were Antigua and Barbuda, Barbados and the United Kingdom, Barbados' third largest source market for imports. Interestingly, Guyana was the only country in the sample that experienced a deceleration of inflation. It is likely that the slower inflation rate is a result of tax measures[3] taken by Guyana's Government to ease the impact of inflation on the residents of Guyana. Japan, the fourth largest source of Barbados' merchandise imports (mainly automobiles), recorded the lowest inflation rate of the sample. This is not at all surprising as Japan has been dealing with negative rates of inflation (deflation) since the mid-1990s and the Bank of Japan struggles to generate consistently positive inflation rates.

Table 1: The Point-to-Point Inflation Rates for Barbados, its Major Trading Partners for Goods and Select Regional Counterparts, June 2021 – June 2022

	2021			2022	
	June	**Sept**	**Dec**	**March**	**June**
Major Trading Partner for Goods					
Canada	3.1	4.4	4.8	6.7	8.1
Guyana	7.0	6.8	5.7	6.8	4.9
Jamaica	4.3	8.2	7.3	11.3	10.9
Japan	-0.4	0.2	0.8	1.2	2.3
Trinidad & Tobago	1.8	2.4	3.5	4.1	4.9
United Kingdom	2.5	3.1	5.4	7.0	9.4
United States of America	5.4	5.4	7.0	8.5	9.1

[2] The exceptionally high rate of inflation in Suriname stems from a combination of circumstances and events comprising fiscal imbalances, excessive money creation, the devaluation of the exchange rate in September 2020 and commodity-price inflation.

[3]The measures comprise: a reduction of freight costs to pre-pandemic levels for the calculation of import taxes from August 2021, and a reduction of the excise tax on gas and diesel from 50% to zero between February 16, 2021 and March 24, 2022.

Table 1 (Cont'd): The Point-to-Point Inflation Rates for Barbados, its Major Trading Partners for Goods and Select Regional Counterparts, June 2021 – June 2022

	2021			2022	
	June	**Sept**	**Dec**	**March**	**June**
Select CARICOM Countries					
Antigua & Barbuda	0.6	2.1	1.2	6.1	10.1
The Bahamas	2.7	4.1	4.1	4.7	6.2
Barbados	2.9	5.6	5.0	9.3	11.5
Belize	3.0	3.8	4.9	5.7	6.7
St. Kitts & Nevis	1.4	1.7	1.9	1.2	3.1
St. Vincent & the Grenadines	1.9	2.7	3.4	3.6	5.2
Suriname	54.0	69.5	60.7	62.2	55.1

Sources: OECD, www.rateinflation.com, respective Central Banks, The Statistical Office of St. Vincent & the Grenadines, St. Kitts & Nevis Department of Statistics

In terms of the macro-financial environment, the sharp rise in global inflation has weakened growth prospects and increased macroeconomic and financial stability risks. Persistently high inflation can cause a host of macroeconomic problems including the erosion of real economic activity, the current account, international reserves and living standards. However, a general decline in average prices over a prolonged period is also undesirable. The experiences of the UK in the 1920s and 1930s, the US in the 1930s as well as Japan in the 1990s and 2000s, show that deflation is associated with suppressed economic output. In short, the expectation of higher prices in the future gives consumers and businesses an incentive to make purchases sooner rather than later, which bolsters economic activity.

This note discusses the potential impact of inflation on the macroeconomy, financial institutions, households, firms and ultimately on financial stability.

Macroeconomic Risks

Economists widely accept the view that low and stable inflation is a prerequisite for macroeconomic stability, since such environments are conducive to efficient resource allocation and economic growth. For this reason, the central banks in many economies that have floating exchange rates and unrestricted cross-border capital mobility use monetary policy in their efforts to achieve low and stable inflation rates.

The findings of early studies by Kormendi and Meguire (1985) and Barro (1991) give credence to the idea that inflation has a negative impact on real economic growth. More recently, threshold panel data modelling was employed by López-Villavicencio and Mignon (2011) to illustrate that there exists an inflation level beyond which growth is hampered. The authors also show that the threshold inflation rate is higher in emerging

economies than in developed countries. In an assessment of the binding constraints to economic growth in Barbados, Mamingi et al. (2018) reveal that energy-price inflation has a negative impact on real economic growth in the short run but a positive effect in the long run. To the extent that inflation triggers a contraction in real economic activity, the risk associated with job losses rises.

As for government finances, higher-than-expected inflation may reduce the debt service capacity of governments if economic activity is suppressed and interest payments increase due to a significant exposure to variable interest rates, which tend to be affected by inflation. On the other hand, a faster-than-anticipated rise in prices might be beneficial to governments by inflating revenues by a greater amount than expenditure and reducing the real value of governments' outstanding debt, especially in cases where the bulk of the debt is under fixed interest rate contracts. An improved fiscal balance is possible if a government collects additional revenue from value added tax and income taxes due to higher prices and wages, which exceeds the inflationary pickup in wages, goods and services and current transfers paid by the government.

Wages may or may not rise in response to higher prices. Craigwell (1991) provides evidence of inflation-led wage increases in Trinidad and Tobago and Barbados with results that show unidirectional causality from prices to wages, while Fosu and Huq (1998) unearth a similar result for production workers in the US. On the contrary, Hondroyiannis (2010) reports that price-wage relationship runs unidirectionally from wages to prices in Greece, based on quarterly data over the period 1980-1998. For the EU-12, Hoxha (2010) finds short- and long-run bi-directional causality between prices and wages. Certainly, in countries such as Belgium, Cyprus, Malta and Luxembourg where a large share of private sector workers benefits from wage-setting schemes based on inflation indexation, the wage rate will rise in response to inflation. Koester and Grapow (2021) explain that around three percent of private sector employees in the euro area have their wages automatically indexed to inflation, while inflation (mainly on a non-energy, forward-looking basis) plays a formal but non-automatic role in the wage negotiations for about 18 percent of private sector employees in the euro area.

On the trade side, inflation can adversely affect the export competitiveness of a country if it increases the price of exports to a point where likely foreign customers would rather source the products from other countries that supply them at lower prices. This assertion is supported in the works of Purusa and Istoqomah (2018) and Chand et al. (2021). Using a panel data model, Purusa and Istoqomah find that inflation has a negative impact on export volumes in Indonesia, Malaysia, Philippines, Thailand and Vietnam. Chand et al. demonstrate that an increase in the ratio of foreign competitor's prices to Fiji's prices raises the demand for Fiji's exports.

Commodity-price inflation is particularly hazardous for highly import-dependent small economies, such as Barbados, since it causes an almost immediate deterioration in the

trade balance of the current account and international reserves. Thus, the small net commodity-importing economy will sustain both a loss of international reserves and higher inflation. The shock to the current account and foreign reserves is amplified if exports decline on account of reduced competitiveness stemming from a rise in inflation that increases export prices relative to the prices of similar products offered by suppliers in other countries.

Inflation can also affect the level and severity of poverty in a country. When the cost of living increases and income remains unchanged, people are made worse off financially. Therefore, if an individual is already finding it difficult to maintain a minimum standard of living, an increase in inflation can push them into a state of poverty where they are unable to afford basic necessities without assistance from others. Sugema et al. (2010) and Talukdar (2012) find that inflation increases poverty in developing countries. In light of current global economic affairs, World Bank (2022) estimates a rise in extreme poverty during 2022.

Financial Stability Risks

High and volatile rates of inflation create financial instability by distorting the path of future cash flows and complicating the investment and saving decisions of market participants. Besides increasing the unpredictability of operating costs, unexpected changes in price movements can have a direct effect on interest rates. For instance, if the inflation rate in a country is projected to rise beyond the expected or targeted level, the central bank may raise interest rates in an attempt to quell inflation. Furthermore, when setting interest rates, banks usually take their forecast of inflation into account, such that nominal interest rates approximate to the sum of the expected inflation rate and the real interest rate (Fisher (1907)). Therefore, an increasing rate of inflation may prompt banks to revise upwards their expectations of future inflation, thus raising the nominal interest rates for variable-interest rate contracts and new fixed-rate contracts.

Fixed interest rates work in the favour of borrowers during episodes of higher-than-expected inflation. However, borrowers could still run into debt servicing problems if their income does not increase enough to offset the higher cost of consumption and investment. For example, where wages are sticky, lending institutions may face a rise in non-performing loans (NPLs) as borrowers fall behind with their loan payments. Some non-financial corporations are also at risk of incurring losses during periods of high inflation. Businesses that provide goods and services that are not deemed essential by most consumers will find it difficult to generate profits if prices remain significantly elevated for a prolonged period of time. In addition, small retailers of essential goods who are unable to make bulk purchases in order to minimise cost, will face a higher probability of falling behind on loan payments and insolvency than their larger counterparts during crises, as they are likely to be priced out of the market. From a June 2022 survey of 1,000 small business owners in the US, Digital.com (2022) reports

that 65 percent of the respondents stated that it is either 'very likely' or 'likely' they will close permanently if inflation continues at its current rate.

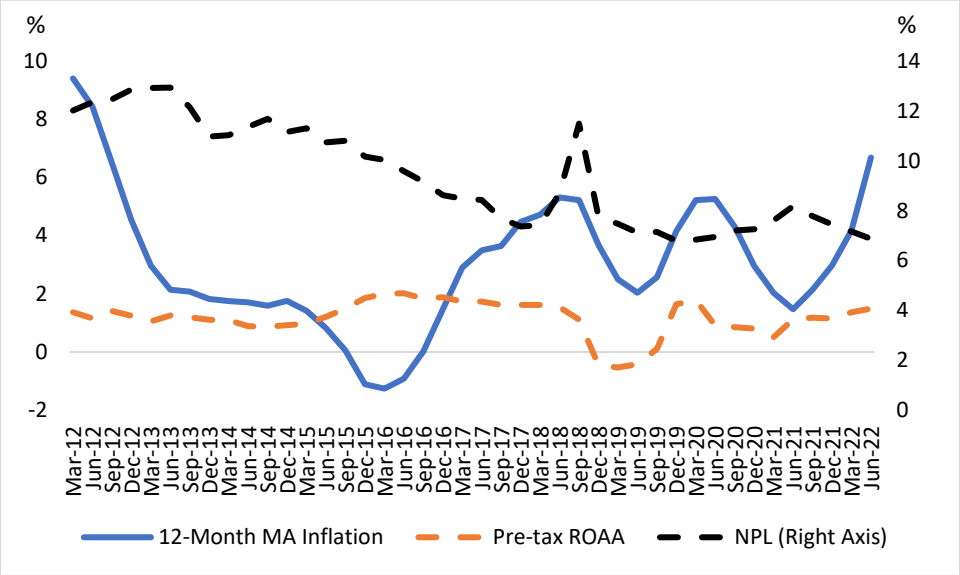
These developments have the potential to negatively affect credit quality, profitability and the capital base of lending institutions. Indeed, the literature supports the notion that loan delinquency can be influenced by inflation. Ghosh (2015) finds that inflation is one of the drivers of NPLs in US-based commercial banks and saving institutions. Similarly, Naili and Lahrichi (2022) identify inflation as a positive determinant of NPLs among 53 banks listed in five Middle East and North African emerging market economies. In assessing the determinants of commercial bank NPLs in Barbados, Greenidge and Grosvenor (2010) and Guy and Lowe (2011) show that credit quality is adversely affected by rapid increases in average retail prices. However, the results of Wood and Skinner (2018) point to a negative but statistically insignificant impact of inflation on the level of loan delinquency recorded by the banking sector in Barbados.

Loan loss provisions, an expense to lending institutions, generally rise in response to higher NPL levels. Secondly, when loans become non-performing, the lender no longer earns interest on those loans. Therefore, inflation can reduce bank profitability through its impact on NPLs. High inflation also raises the cost of overheads and may reduce stock market returns. For these reasons, the idea of a negative relationship between inflation and bank profits seems reasonable. However, the results from studies that investigate this relationship are mixed. In a study of 534 banks from across 19 emerging market economies, Kohlscheen et al. (2018) show that inflation exerts a negative but statistical insignificant influence on profits. When the authors divided profits into three components and regressed them on the selected independent variables, the results reveal that inflation has a statistically significant negative effect on the net interest margin and positive impacts on non-interest income and loan loss provisions.

Other studies such as Khrawish (2011) for Jordanian banks, Mandai (2012) for banks listed on the Indonesian stock exchange, Rahman et al. (2015) for 25 banks registered in Bangladesh, and Mamatzakis and Bernpei (2016) for a sample of 6,771 US banks, provide evidence of a statistically significant negative impact of inflation on profitability. On the other hand, Vong and Chan (2007) find that higher inflation increases bank profitability in the Macao Special Administrative Region of China.

Figure 2 illustrates the evolution of Barbados' 12-month moving averaging rate of inflation (π) in relation to the average NPL ratio for each quarter (NPL) and a measure of profitability (pre-tax return on average assets (ROAA)) of resident commercial banks from the first quarter of 2012 to the second quarter of June 2022. A cursory visual inspection of the graph indicates that inflation appears to have a lagged relationship with the NPL ratio and the ROAA.

Figure 2: Inflation, NPLs and Profitability, Q1 2012 – Q2 June



Source: Central Bank of Barbados

The correlation coefficients presented in Table 2 help to better depict the linear relationships inflation has with loan delinquency and profitability. As expected based on Figure 2, the contemporaneous relationship between inflation and NPLs yields a very weak, statistically insignificant correlation coefficient of -0.05. However, when NPLs are examined in relation to the lagged effects of inflation, the correlation turns positive as generally seen in the literature, while the strength and statistical significance of the correlation improve with each lag from one to four.

As for profitability, the contemporaneous correlation with inflation is weak and statistically insignificant but has the *a priori* expected negative sign. Similar to the case of NPLs, profitability is more strongly related to lagged inflation. As the lag length on inflation increases, the correlation between profitability and inflation moves from a coefficient of -0.22 to -0.41, then down slightly to -0.40 at the fourth lag. Interestingly, the relationships between inflation and NPLs as well as inflation and ROAA both became statistically significant from the point where inflation was lagged two periods (six months).

Overall, these results suggest that inflation in Barbados does not affect loan delinquency or bank profitability immediately as inflation pressures take some time to build before it can materially compromise financial stability. For the most part, the linear relationship between ROAA and inflation is shown to be stronger than that of the NPL ratio and inflation. This finding likely reflects the fact that there is more than one channel through which inflation can dampen bank profits.

Table 2: Correlations between NPL and π (t- 0 to 4), ROAA and π (t- 0 to 4)

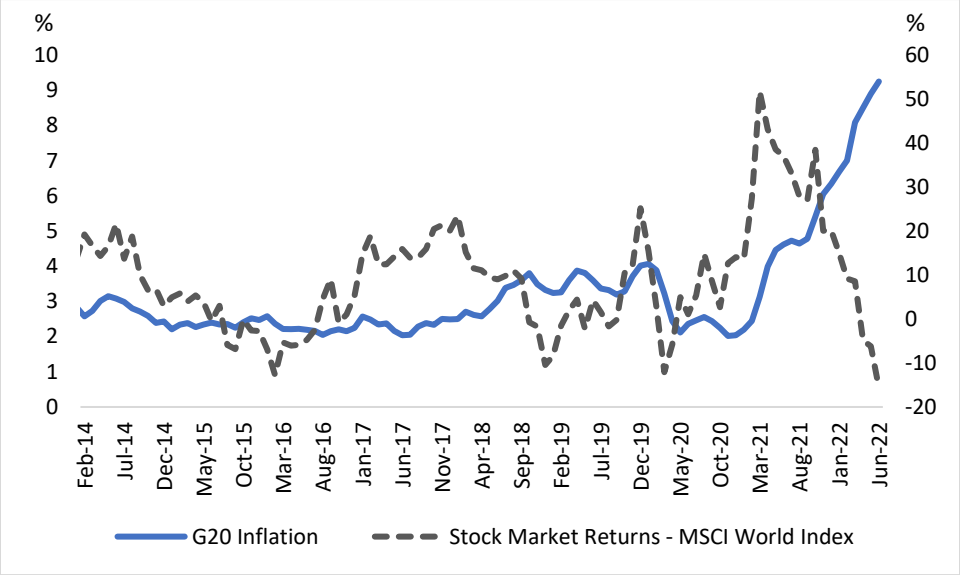
	NPL	***ROAA***	**π**	**π (t-1)**	**π (t-2)**	**π (t-3)**	**π (t-4)**
NPL	*1*		*-0.05*	*0.15*	*0.28**	*0.38***	*0.43****
ROAA		*1*	*-0.05*	*-0.22*	*-0.35***	*-0.41****	*-0.40****

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% levels of testing.

Shifting the conversation to liquidity, a sharp rise in commodity-price inflation can potentially place downward pressure on both foreign-currency and domestic-currency liquidity in the banking system of net commodity-importers. Foreign-currency liquidity may be depleted as more foreign currency is required to import the same quantity of goods as before the spike in commodity prices. If foreign currency demand exceeds what is available at DTIs, domestic currency will be taken from the deposits of importers to purchase the needed foreign currency from the Central Bank. This reduces domestic-currency liquidity as the Central Bank takes the domestic currency out of circulation by purchasing it.

Higher-than-expected inflation generally triggers a rise in interest rates, which can cause stock market investors to fear the worst about future economic growth and stock performance. As concerned investors seek to reduce their stock holdings, market volatility increases and average stock returns decline. Historical trends show that stock market returns are generally lower during periods of high inflation (Figure 3).

Figure 3: Inflation and Stock Market Returns, January 2014 – June 2022



Sources: OECD, Bloomberg, Author's Calculations

Similar to banks with fixed-interest loan portfolios, holders of non-inflation-linked fixed-income debt securities suffer a reduction in real return on their investment when prices increase beyond expectations. Additionally, the higher interest rate caused by the

unexpected hike in inflation will reduce the current market value of these debt securities. The real earnings of pension funds are also likely to shrink as a result of higher-than-expected inflation, while retirees and some near-retirees will experience a loss in the real value of their pensions as purchasing power is eroded. Similarly, mutual funds are not exempt from the potential losses in real returns.

Many financial market commentators argue that inflation-indexed debt securities such as the US Treasury Inflation-Protected Securities, should feature more heavily in the portfolios of pension and mutual funds since they are low-risk, inflation-resistant investment vehicles. On the downside, the value of inflation-linked securities is subject to fluctuations in the price index used to measure inflation. In an examination of inflation-index bond markets in the US and the UK, Campbell et al. (2009) posit that inflation-indexed bonds provide a safe option for long-term investors despite low yields and volatile returns.

Adequate insurance coverage enhances the financial stability of the policy holder by acting as buffer against potential negative shocks. An extended period of high inflation may cause insurance companies, particularly non-life insurers, to increase their premiums to offset the rise in operating costs and the value of claims. The higher premiums may force some clients to reduce their policy coverage or discontinue the policy altogether, resulting in an increase of underinsured and uninsured individuals, households and firms. Lack of insurance raises exposure to financial risks since the aim of insurance is to minimise the losses from unforeseen adverse events.

Conclusion

Inflation expectations play an important role in the financial decisions of economic agents, from the setting of interest rates to salary negotiations. A low, stable and somewhat predictable inflation rate is desirable for economic development and financial stability. For this reason, higher-than-expected inflation can be distortionary and usually places some strain on households, governments, financial institutions and non-financial firms. Empirical evidence shows that high inflation can be detrimental to real economic growth and extremely harmful to the poorest among us. As for financial stability risks, elevated rates of inflation are linked to increased loan delinquency, the erosion of bank profitability, higher non-life insurance premiums, financial market volatility and lower real returns on financial assets. To hedge, investors with access to inflation-indexed securities are encouraged to explore those options, given the low-risk nature of such instruments.

High commodity-price inflation falls particularly hard on small, net commodity-importing economies. During periods of rapidly rising commodity prices, net commodity importers have to manage the dual shock of high inflation and loss of international reserves. For a country such as Barbados that has no influence on international prices of goods and services, the effects of inflation emanating from cost-

push factors such as weather changes, viral outbreaks and war are difficult to avoid and require extremely costly measures to address. To ensure the financial position of governments does not quickly deteriorate during episodes of high inflation, they should refrain from excessive social support measures and target the most vulnerable in society. Additionally, central banks that target inflation should communicate frequently and clearly to the public about their price projections and mitigation plans in an effort to keep inflation expectations in check. Given the unpredictability of global inflationary pressures, households, governments and companies are urged to always incur debt responsibly and engage in precautionary saving to secure some buffer against price shocks and preserve financial stability.

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Appendix A: Macro-Prudential Indicators

Table 1: Partial Indicators for Banking Stability Index

Partial Indicator	Weight	Variable	Systemic Impact of Financial Stability
Capital Adequacy	0.05	Regulatory Capital to RWA	+
		Tier 1 Capital to RWA	+
		Tier 1 Capital to Total Assets	+
Asset Quality	0.3	NPLs to Total Loans	-
		NPLs (net of provisions) to Tier 1 Capital	-
Profitability	0.25	Return on Assets	+
		Return on Equity	+
Liquidity	0.2	Liquid Assets to Total Assets	+
		Liquid Assets to Short-term Liabilities	+
		Loans to Total Deposits	-
Foreign Exchange Rate Risk	0.1	Net Foreign-Currency Position to Tier 1 Capital	-
Interest Rate Risk	0.1	Spread between Commercial Bank Average Lending Rate to Average Deposit Rate	+

Source: Central Bank of Barbados

Table 2: Partial Indicators for Aggregate Financial Stability Index

Partial Indicator	Weight	Variable	Systemic Impact of Financial Stability
Financial Development	0.1	Total Credit to GDP	+
Financial Vulnerability	0.4	Inflation Rate	-
		Current Account Balance to GDP	+
		Net Foreign Assets to Total Assets	-
		Broad Money to Net International Reserves	-
		Fiscal Balance to GDP	-
		Real Effective Exchange Rate	-
		Net International Reserves to External Debt	+
Financial Soundness	0.4	Capital to Total Risk-Weighted Assets (RWA)	+
		Liquid Assets to Total Assets	+
		NPLs to Total Loans	-
World Economic Climate	0.1	World Economic Growth	+
		CBOE Volatility Index	-
		Global Economic Barometer	+

Source: Central Bank of Barbados

Table 3: Partial Indicators for Financial Stability Cobweb

Partial Indicator	Variable	Systemic Risk Impact
Domestic Environment	Inflation Rate	+
	Total Fiscal Deficit to GDP	+
	Total Sovereign Debt to GDP	+
	Broad Money to Net International Reserves	+
Domestic Financial Market Conditions	Barbados T-Bill Rate[7]	+
	Return on Barbados Stock Exchange Main Index	-
Global Financial Market Conditions	MSCI World Index of Equity Returns	-
	CBOE Volatility Index	+
	JP Morgan Emerging Market Bond Index Spread	+
Global Environment	MSCI World Growth Index	-
	Crude Oil (petroleum) simple average Brent, West Texas Intermediate, and the Dubai Fateh	+
Capital & Profitability Quality	Capital Adequacy Ratio	-
	Return on Assets	-
Funding and Liquidity	Loan to Deposit Ratio	+
	Liquid Assets to Total Assets	-

Source: Central Bank of Barbados

[7] Not applicable to calendar year 2018 nor fiscal year 2018/2019.

Appendix B: Financial Development Indicators

Table 1: Keys Indicators of the Structure of the Financial System

	2015	2016	2017	2018	2019	2020	2021
Number of:							
Total DTIs	47	47	46	45	43	42	41
Commercial Banks	5	5	5	5	5	5	5
Finance, Trust and Mortgage	8	8	8	7	5	5	4
Credit Unions	34	34	33	33	33	32	32
Non-DTI Trust Companies	5	5	5	5	5	5	0
Insurance Companies	21	24	23	23	23	21	20
Life	6	8	7	7	8	6	6
Non-Life	15	16	16	16	15	15	14
Pension Plans	300	303	310	274	269	261	251
Mutual Funds	19	16	16	16	16	16	16
Assets to Total Financial System Assets (%)							
Total DTIs	68.7	67.6	67.8	67.1	66.0	66.4	66.4
Commercial Banks	53.9	53.3	52.9	52.8	51.6	51.6	51.5
Finance, Trust and Mortgage	6.9	6.2	6.2	4.2	4.0	3.9	3.9
Credit Unions	7.9	8.2	8.7	10.0	10.5	10.9	11.0
Non-DTI Trust Companies	1.8	1.9	0.4	0.1	0.1	0.0	0.0
Insurance Companies	12.9	13.7	14.0	14.4	14.7	14.6	14.2
Life	8.5	9.6	9.9	10.2	10.5	10.7	10.4
Non-Life	4.4	4.2	4.1	4.2	4.2	3.9	3.9
Pension Plans	8.7	8.7	9.1	9.7	9.6	9.4	9.2
Mutual Funds	7.8	8.0	8.7	8.8	9.7	9.6	10.2
Assets to GDP (%)							
Total DTIs	172.5	174.3	173.1	159.0	154.8	181.3	182.3
Commercial Banks	135.2	137.4	135.2	125.3	120.9	141.0	141.5
Finance, Trust and Mortgage	17.4	15.9	15.7	10.0	9.4	10.6	10.6
Credit Unions	19.9	21.1	22.2	23.8	24.5	29.8	30.3
Non-DTI Trust Companies	4.6	5.0	1.1	0.2	0.1	0.1	0.1
Insurance Companies	32.5	35.4	35.7	34.0	34.4	39.9	39.1
Life	21.4	24.7	25.3	24.1	24.5	29.3	28.4
Non-Life	11.1	10.7	10.4	9.9	9.9	10.5	10.6
Pension Plans	21.8	22.3	23.3	23.0	22.4	25.6	25.2
Mutual Funds	19.6	20.7	22.2	20.8	22.7	26.2	27.9
Memo:							
Credit Union Membership (000's)	176	186	195	206	216	222	228
Pension Plans Membership (000's)	31	29	29.274	28	26	24	27

Source: Central Bank of Barbados and Financial Services Commission

Table 2: Key Indicators of the Payment System

$ Millions	2015	2016	2017	2018	2019	2020	2021
RTGs Transactions	30,731	33,561	36,781	27,001	11,668	14,771	15,488
ACH Transactions	18,689	18,501	19,584	19,559	19,293	17,268	19,710
Cheques	16,847	16,385	17,343	17,151	15,573	11,412	10,198
Direct Payments	1,842	2,116	2,241	2,408	3,719	5,855	9,512
CARIFS Debit Card Transactions	1,067	1,136	1,197	1,248	1,324	1,223	658
ATM Transactions	620	639	660	675	698	611	329
Debit Card POS Transactions	447	497	537	573	626	612	328
Credit Card Transactions	664	737	725	717	739	646	726
Personal Sector	559	615	615	607	604	520	574
Business Sector	105	122	110	110	135	126	152
Currency in Circulation (Outside of Select Financial Institutions)	538	573	599	626	656	736	799

Source: Central Bank of Barbados

Appendix C: Key Financial Soundness Indicators

Table 1: Commercial Banks' Financial Soundness Indicators (FSIs)

	2015	2016	2017	2018	2019	2020	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
Solvency Indicators (%)											
Capital Adequacy Ratio (CAR)	15.8	17	17	13.8	13.5	16	15.9	16.1	16.1	16.8	17.7
Leverage Ratio	7.9	8.5	8.6	7.5	7	9.5	9.5	9.4	9.4	9.9	10.0
Non-performing loans net of provisions to capital	25.4	16.0	7.4	14.8	16.3	11.6	13.2	13.9	12.3	11.4	9.9
Liquidity Indicators (%)											
Loan to deposit ratio	77.6	74.2	74.8	63	61.7	57.1	55.2	53.9	53.2	53.0	50.0
Transferable deposits to total deposits	88.6	90.3	90.1	92.3	94.8	95.9	95.9	96.0	96.2	96.3	96.6
Domestic transferable deposits to total domestic deposits	88.8	90.6	91.5	92.7	94.9	95.9	96.0	96.1	96.3	96.4	96.5
Liquid assets to total assets (Domestic)	29.9	32.5	32.6	26.1	21.8	25.4	28.3	28.7	29.7	28.8	30.6
Credit Risk Indicators (%)											
Total assets	4.1	4	1.4	-6	1.3	3.1	2.6	3.5	6.2	4.0	7.6
Domestic assets	4.2	3.5	0.9	3	3.3	4.1	7.1	6.1	4.9	3.5	4.7
Loans	-0.7	-0.6	1.4	-0.7	-0.6	-2.07	-1.7	-1.5	-2.1	-2.1	-1.4
NPL ratio	10.2	8.6	7.7	7.4	6.6	7.3	7.9	8.1	7.5	7.4	7.0
Substandard loans/ Total loans	7.7	6.9	6.1	5.7	5.2	5.5	6.1	6.5	5.9	5.7	5.6
Doubtful loans/ Total loans	1.4	1	0.8	0.9	0.5	1.3	1.3	1.1	1.0	1.0	1.0
Loss loans/ Total loans	1.1	0.7	0.8	0.8	0.9	0.5	0.5	0.6	0.6	0.6	0.4
Provisions to NPLs	55.5	62.7	80.4	67.3	59.4	62.0	59.2	58.6	59.9	59.6	60.9
Foreign Exchange Risk Indicators (%)											
Foreign Currency Loans to Total Loans	5.3	5.1	4.4	4	2.9	1.8	1.8	1.8	1.8	1.7	1.6
Deposits in Foreign Exchange to Total Deposits	7.9	7.9	8.1	6.8	6.7	8.0	6.3	7.6	8.1	7.8	9.4
Profitability Indicators (%)											
Return on Assets (ROA)	1.4	1.5	1.3	-0.2	0.6	0.77	0.5	1.1	1.1	1.1	1.3
Net Interest Margin	4.7	5	5.2	5.3	5.7	4.9	4.8	4.6	5.4	4.5	4.4
Interest Rate Spread	5.4	5.7	5.8	6	6.1	5.7	5.6	5.6	5.5	5.4	5.4

Source: Central Bank of Barbados
 # Includes foreign components unless otherwise stated

Table 2: Finance and Trust Companies' Financial Stability Indicators (FSIs)

%	2015	2016	2017	2018	2019	2020	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1
Solvency Indicators											
Capital Adequacy Ratio (CAR)	35.2	36.2	38.8	21.8	18.4	19.3	19.5	19.7	19.7	19.0	20.5
Leverage Ratio	19.7	21.3	22.0	11.5	11.2	12.1	12.9	12.8	12.6	12.4	13.3
Non-performing loans net of provisions to capital	19.5	17.8	14.5	28.5	45.3	45.7	51.1	59.0	60.0	61.7	56.2
Liquidity Indicators#											
Domestic Loans to domestic deposits	97.8	110.0	104.1	98.2	99.1	101.1	103.7	103.8	105.0	101.1	106.7
Transferable deposits to total deposits	14.8	12.1	18.6	1.4	2.6	3.7	4.5	4.9	5.3	5.6	6.6
Domestic liquid assets to domestic total assets	16.5	16.5	17.7	12.2	9.7	8.8	8.1	8.6	8.1	6.9	6.8
Credit Risk Indicators (percent)											
Total assets	1.0	(6.8)	2.4	(35.4)	(2.0)	(0.5)	(0.8)	(1.2)	2.6	4.1	4.7
Domestic assets	2.5	(7.1)	2.8	(35.5)	(3.8)	0.4	0.0	(0.1)	(0.2)	0.4	(1.3)
Total Loans and advances	-1.4	(3.0)	(1.7)	(25.0)	(0.0)	1.8	0.9	2.1	1.8	1.8	2.4
Non-performing loans ratio	9.6	9.5	9.4	8.4	11.3	11.7	13.3	15.3	15.7	16.1	15.3
Substandard loans/ Total loans	6.1	6.3	6.4	6.8	8.9	9.3	11.0	12.7	12.8	13.3	12.8
Doubtful loans/ Total loans	2.7	2.5	0.8	0.6	0.6	0.9	0.9	0.7	0.9	0.7	0.6
Loss Loans/ Total loans	0.8	0.6	2.3	1.0	1.7	1.5	1.5	1.8	2.0	2.0	1.9
Provisions to NPLs	43.8	43.3	44.9	31.0	26.0	24.1	27.0	24.1	25.0	24.0	26.0
Foreign Exchange Risk Indicators (percent)											
Deposits in Foreign Exchange to Total Deposits	1.3	1.4	1.4	0.2	1.3	1.7	2.5	3.0	3.6	5.1	5.1
Profitability Indicators (%)											
Return on Assets (ROA)	0.8	1.4	1.2	0.4	1.2	0.7	0.7	0.8	0.8	1.0	1.1
Net Interest Margin	4.0	4.2	4.7	4.7	4.5	4.5	4.4	4.6	4.5	4.4	4.5
Interest Rate Spread	3.9	4.2	4.7	4.4	4.5	4.3	4.2	4.3	4.2	4.2	4.2

Source: Central Bank of Barbados

Table 3: Credit Unions' Financial Stability Indicators (FSIs)

%	2015	2016	2017	2018	2019	2020	2021
Solvency Indicators							
Capital to Assets	11.6	11.8	11.9	11.3	11.0	10.5	10.7
Reserve to Liabilities	9.7	9.9	10.0	9.8	9.6	9.5	9.6
Liquidity Indicators							
Loan to Deposit Ratio	90.8	89.3	86.7	81.9	78.4	73.5	73.3
Credit Risk Indicators							
Assets Annual Growth Rate	7.3	8.4	8.6	9.5	7.5	7.3	5.3
Loans Annual Growth Rate	6.5	7.4	6.3	4.2	3.5	0.9	4.5
NPL Ratio	9.1	7.6	7.8	8.9	9.6	13.1	12.8
Arrears 3-6 months	2.0	1.3	1.3	1.9	1.9	2.2	1.5
Arrears 6-12 month	1.8	1.2	1.4	1.4	1.6	3.6	2.4
Arrears over 12 months	5.2	5.1	5.1	5.5	6.1	7.3	8.8
Provisions to Loans	2.6	2.5	2.4	2.6	2.8	3.1	4.0
Profitability Indicator							
Return on Assets	0.6	0.8	0.9	0.7	0.7	0.5	0.5

Source: Financial Services Commission

Table 4: Life Insurance Performance Indicators

%	2015	2016	2017	2018	2019	2020	2021
Capital Adequacy							
Capital to Assets Ratio	31	43	46	45	46	48	49
Asset Quality							
Rein. Ceded to GPW	7	12	14	11	11	11	7
Actuarial Risk							
Risk Retention Ratio	93	88	86	89	89	89	93
Earnings							
Return on Assets	5	6	5	6	5	4	4

Source: Financial Services Commission

Table 5: General Insurance Performance Indicators

%	2015	2016	2017	2018	2019	2020	2021
Capital Adequacy							
Net Prem. to Capital	72	73	81	114	142	136	88
Capital to Assets Ratio	29	29	27	21	17	18	27
Asset Quality							
Rein. Ceded to GPW	55	52	51	52	51	52	53
Actuarial Risk							
Risk Retention Ratio	47	49	51	50	52	51	50
Profitability and Earnings							
Loss Ratio	64	60	64	65	61	58	62
Return on Assets	1	2	0	-2	2	4	4

Source: Financial Services Commission

Table 6: Mutual Funds Performance Indicators

%	2015	2016	2017	2018	2019	2020	2021
Asset Concentration							
(Related Party Investments/Total Assets)	-	9.9	27.2	28.4	30.0	30.7	30.2
Liquidity							
(Liquid Assets/Total Assets)	7.0	9.4	7.7	6.1	6.3	4.9	5.2
Asset Growth							
Return on Net Assets (Net Income/Net Assets)	3.4	8.7	13.3	(1.8)	8.6	(3.6)	24.1
Growth in Net Assets Under Management	-	(5.7)	26.4	(3.8)	13.5	1.9	10.5

Source: Financial Services Commission