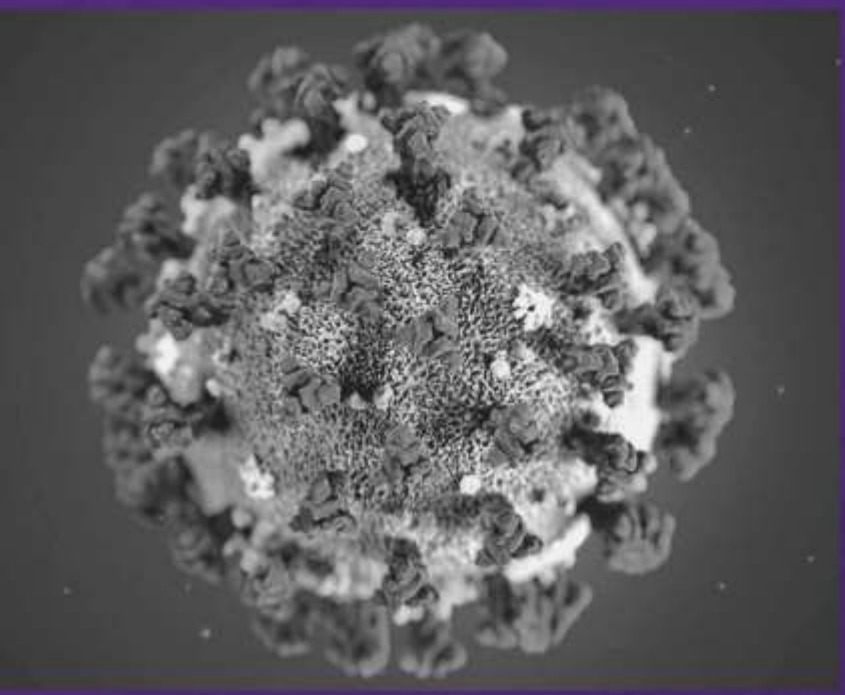
FINANCIAL STABILITY REPORT



2020

CENTRAL BANK OF BARBADOS

FINANCIAL SERVICES COMMISSION

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Preface

Oversight of the financial system is shared between 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 the continuous oversight of the financial system, the assessment of vulnerabilities and the identification of policies to increase the resilience of the system in the face of possible adverse events.

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 tenth 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
BOJ	Bank of Jamaica
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
GDP	Gross Domestic Product
GPW	Gross Premiums Written
IFRS	International Financial Reporting Standards
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

The severe impact of the COVID-19 pandemic on macro-economic conditions shifted economic policy as the Government of Barbados focused its efforts on preserving lives and livelihoods. Revised targets under the Extended Fund Facility with the International Monetary Fund were achieved, but the effects of the virus on households and businesses elevated financial sector risks. However, given the pre-COVID strength of financial institutions and the regulatory support provided by the Central Bank and the Financial Services Commission, the system remains stable.

The financial sector continued to grow with commercial banks, which dominate the sector, contributing the most to asset growth. Despite the COVID-related challenges, banks remained well-capitalised and with substantial liquidity that will help them to cope with emerging risks. The capital of insurance companies, life and general, also improved, partly because lower operating costs enhanced their profitability.

The assets of long-term investors such as life insurance companies, mutual funds and pension funds also continued to grow, but the low interest rate environment and the unavailability of new investment instruments limited the investment options for these institutions.

Reduced economic activity, heightened unemployment and lower employment incomes influenced the inability of some borrowers to service their debt obligations. However, banks and other lending institutions, including credit unions, tempered the effects of the interruption in employment opportunities and business operations by offering moratoria on loan repayments and restructuring debt in some cases.

There is evidence of rising non-performing loans (NPLs), but these measures contained NPLs to levels that are well below expectations, given the jump in unemployment and decline in economic activity. To cushion potential negative effects on their balance sheets, banks increased their precautionary provisions on these loans without adverse effects on their capital adequacy. The pandemic has placed a new perspective on loan delinquency across the entire financial sector and new approaches to credit risk management of affected loans are needed.

With the tourism industry only expected to recover gradually, due to the uncertainty associated with the continued spread of the virus and the success of the global and local vaccination efforts, stress tests for the financial system assume greater significance. These tests suggest that even with extreme shocks, the system is still capable of withstanding substantial increases in NPLs or provisions that are associated with heightened credit risk. However, the Bank and the FSC will need to continue to monitor individual institutions.

2. Macro-Financial Environment

2.1 Domestic Economic Conditions

During 2020, the world economy was derailed by COVID-19, as travel bans and stay-at-home orders were imposed to contain the pandemic. As a small country that specialises in tourism, the Barbadian economy was among the hardest hit. Barbados experienced declines in all major economic industries, with the exception of agriculture, which benefited from improved weather conditions and new arable lands that were brought into the production for food crops.

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

	2019	2020[E]	2021[F]
Major Tourism Source Markets			
Canada	1.9	(5.3)	6.3
UK	1.4	(9.8)	7.0
USA	2.2	(3.5)	7.0
World	2.8	(3.2)	6.0
Select Caribbean Tourism Destinations			
Aruba	0.4	(25.5)	5.0
Antigua & Barbuda	3.4	(17.3)	(3.0)
The Bahamas	1.2	(16.3)	2.0
Barbados	(0.1)	(17.6)	4.1
Jamaica	1.0	(10.2)	1.5
St. Lucia	1.7	(18.9)	3.1

Source: World Economic Outlook April and July 2021(Update)
Note: [E] represents estimates and [F] represents forecasts

A 70 percent fall-off in tourism stemmed from lower stay-over and cruise arrivals. With the spill-over effects on ancillary sectors, domestic spending fell, resulting in an estimated 18 percent contraction in overall economic activity, elevated unemployment levels and reduced incomes. As it relates to prices, the rate of inflation slowed, largely reflecting lower prices for fuel and electricity and discounting by retailers.

The economic downturn was especially steep during the second quarter of 2020 when the economy was under lockdown for an extended period. Towards yearend there were signs of a gradual recovery in tourism, but a second wave of COVID-19 infections triggered business closures and curfews during the first quarter of 2021 that contributed to a reduction in real GDP, estimated at 20 percent, relative to the corresponding three-month period in 2020. Unemployment remained elevated and inflation continued to slow during the quarter.

The contraction in economic activity and its impact on government's revenue and spending led government to alter its fiscal stance. The primary balance target shifted from a programmed surplus of 6 percent to a deficit of one percent for FY 2020/21. As a result, government's operations incurred an overall deficit of $429.6 million, in contrast to the $384.5 million surplus recorded one year earlier. Revenue fell by 14.1 percent as domestic tax revenues declined sharply, but the fall was attenuated by corporate tax receipts, which rose on the strength of collections from foreign-currency earning firms.

In addition to the higher expenditure induced by pandemic-related spending, interest payments rose in response to the resumption of foreign commercial debt service following the conclusion of the external debt exchange during the last quarter of 2019. To support the policy shift, the majority of government's borrowing has been from international financial institutions. As a consequence, the stock of debt increased, reversing the trend over the past two years; however, the steep decline in economic activity was responsible for more than 80 percent of the rise in the debt-to-GDP ratio, which surged by 35.3 percentage points to 151.8 percent at end-March 2021.

The external current account deficit deteriorated from 2.9 percent of GDP in 2019 to 6.2 percent in 2020, as the reduction in current account inflows, especially travel receipts and other exports, outweighed the decline in imports and other current account outflows. Nonetheless, the gross international reserves of the monetary authorities increased by $1.2 billion, owing primarily to significant public sector foreign borrowing and to a lesser extent lower outward investment flows by the private sector. Over the first three months of 2021, gross international reserves fell by $86 million, due principally to the negative impact of COVID-19 on the tourism sector; however, the import reserve cover remained elevated at 43 weeks.

Table 2: Selected Economic Indicators

	2016	2017	2018	2019	2020	March 2020	March 2021
				Percent			
Real Sector							
Real GDP Growth	2.8	0.6	(0.5)	(1.3)	(18.0)	(4.9)	(19.7)
Inflation	1.5	4.5	3.7	4.1	2.9	5.2	1.9
Unemployment Rate	9.0	8.2	11.6	8.9	13.6	n.a	17.2
				In percent of GDP			
Public Sector							
Central Government Balance *(Fiscal Year)*	(5.3)	(4.6)	(0.3)	3.6	(5.1)	(1.0)	0.7
Primary Fiscal Balance *(Fiscal Year)*	2.2	3.2	3.5	6.0	(1.0)	(0.3)	1.4
Central Government Debt	140.6	136.9	124.5	117.3	141.7	116.5	151.8
Gross Public Sector Debt	153.4	148.4	125.4	118.0	142.3	117.0	152.5
External Sector							
Current Account	(4.3)	(3.8)	(4.4)	(2.9)	(6.2)	0.6	(13.5)
Financial Account	0.9	0.9	8.7	7.5	18.3	2.0	9.2
				BDS $Mil, unless otherwise stated			
Monetary							
Net Domestic Assets	1,906.5	2,041.2	1,788.8	1,761.6	1,296.2	1771.4	1735.8
NIR	574.9	334.7	832.5	1,130.8	2,195.0	1209.8	2096.0
GIR	639.8	411.3	999.6	1,481.0	2,660.7	1574.9	2574.3
Import Reserve Cover (Goods & Services) (Weeks)	8.2	5.3	12.8	18.6	40.7	19.5	43.1

Source: Barbados Statistical Service and Central Bank of Barbados

Box 1: Monetary and Macroprudential Policy Responses to COVID-19

In addition to being a health crisis, COVID-19 triggered the most significant economic peril since the financial crisis of 2008. Fortunately, the global financial system was in a position to withstand the pandemic due to regulatory measures that were put in place after the 2008 crisis. Prompt decisive actions were taken by monetary authorities and financial institutions in response to the pandemic, and large banks within the G20[1] reaped the benefits from pre-COVID capital, liquidity and leverage requirements. The shock-mitigating measures taken by central banks, including regulatory forbearance, were instrumental to maintaining financial stability. These actions complemented the fiscal response, which resulted in substantial expansions in fiscal deficits and debt during the pandemic as governments sought to ease the economic strain on households and businesses. This box highlights some of the actions taken in response to the COVID-induced crisis by select authorities, including Barbados.

Responses of Monetary Authorities

Given the anticipation of a liquidity crunch, the monetary authorities in most of the G20 economies cut their policy rates, whether it be the discount rate or the repo rate, in the wake of the pandemic. Besides the use of policy rates, many central banks in the G20 enhanced their liquidity support to banks and other deposit-taking institutions (DTIs).

Some G20 central banks, particularly in Latin America lowered the regulatory requirements for deposit reserves, while about 40 percent of the monetary authorities in the G20 lowered the capital requirement ratios for banks in their jurisdictions, largely through the release of countercyclical capital buffers. A countercyclical capital buffer (CCyB) is intended to protect the banking sector against losses that could be caused by an increase in cyclical systemic risks. When the regulator perceives that financial-system risk is rising at an alarming rate, it can increase the CCyB. After a shock or the dissipation of risks, the regulator can reduce the CCyB to support the supply of credit to the real economy. Authorities in France, Germany and the United Kingdom (UK) reduced their CCyB in response to the COVID-19 shock. On the other hand, to conserve capital at the height of the pandemic, central banks in Australia, India, Turkey and the UK placed restrictions on dividend payments by banks, while authorities in the European Union and

Mexico advised against making dividend payments, but did not formally enforce this guidance.

Table 1: Main Responses to COVID-19 by Monetary Authorities in the G20

	Responses					
	Reduce Reserve Requirement for Licensees	Reduce Policy Rate	Regulatory Forbearance	Enhanced Commitment to Liquidity Support of Licensees	Reduce Capital Requirements for Licensees	Purchase of Government securities on Secondary Market
Argentina	✓		✓			
Australia		✓	✓	✓		✓
Brazil	✓	✓	✓	✓	✓	
Canada		✓	✓	✓	✓	✓
China		✓	✓	✓		
France			✓	✓	✓	
Germany			✓	✓	✓	
India	✓	✓	✓			
Indonesia	✓	✓	✓	✓	✓	
Italy			✓	✓	✓	
Japan			✓	✓		✓
Mexico	✓	✓	✓	✓		✓
Russia		✓	✓			
Saudi Arabia		✓	✓			
South Africa		✓	✓			✓
South Korea		✓	✓	✓		✓
Turkey		✓	✓			✓
United Kingdom		✓	✓		✓	
United States of America		✓	✓	✓		
European Union			✓	✓	✓	

Source: International Monetary Fund

The actions taken by the monetary authorities across CARICOM were quite varied. The central banks in Belize, Guyana, Haiti, Jamaica, Suriname and Trinidad & Tobago, lowered their cash reserve requirements for banks and other licensees, whereas Barbados reduced the Government securities requirement for banks and totally eliminated the securities requirement for deposit-taking finance and trust companies. The central banks of Barbados, the Eastern Caribbean and Trinidad & Tobago all lowered their discount rates on overnight lending to reduce the cost of liquidity to commercial banks and other licensees. The Central Bank of Barbados also indicated its readiness to make collateralised loans to its licensees for up to six months.

In Jamaica, besides the reduction of cash reserve requirements, the Bank of Jamaica (BOJ) strived to ensure system-wide liquidity by removing limits on the amounts

that DTIs can borrow overnight without being penalised, broadening the range of acceptable repo

collateral, and instituting a bond-buying programme for Government of Jamaica and BOJ securities.

For the purpose of conserving international reserves, the Central Bank of The Bahamas suspended the approval of foreign exchange outflows for portfolio investment via the Investment Currency Market (ICM) and the Bahamas Depository Receipt (BDR) programme. It also requested the National Insurance Board (NIB) to repatriate some of its assets which were invested abroad. The BOJ also tightened exchange controls through the containment of foreign reserve sales via the BOJ Foreign Exchange Intervention & Trading Tool (B-FXITT). Following the advice of the authorities, DTIs and financial holding companies in Jamaica suspended their payment of dividends in an effort to maintain healthy capital levels.

Temporary regulatory forbearance varied across the region. Moratoria on loan payments represent the most widely used relief facility by banks and other lenders, and central banks exercised forbearance by allowing licensees to not classify loans that were under moratoria as non-performing. In Belize, the central bank reduced the risk weight for loans to the tourism sector from 100 percent to 50 percent.

To fight the virus and its economic effects, including heightened borrowing requirements, the Eastern Caribbean Central Bank (ECCB) altered its credit allocation budget, thereby increasing its lending capacity to member governments.

Table 2: Main Economic Responses to COVID-19 by Monetary Authorities in CARICOM

	Responses				
	Reduce Reserve Requirement for Licensees	Reduce Discount Rate	Regulatory Forbearance	Enhanced Commitment to Liquidity Support of Licensees	Exchange Control Measures
The Bahamas			✓		✓
Barbados	✓	✓	✓	✓	
Belize	✓		✓		
Eastern Caribbean Currency Union		✓	✓		
Guyana	✓		✓		
Haiti	✓		✓		
Jamaica	✓		✓	✓	✓
Suriname	✓		✓		
Trinidad & Tobago	✓	✓	✓		

Source: International Monetary Fund and National Central Banks

The measures taken by the monetary authorities in large and small states reflect the magnitude of the shock on economies and financial systems. Policy responses in individual countries reflect the institutional framework and the buffers available to cope with the crisis. The measures are intended to safeguard financial stability, and highlight the importance of maintaining appropriate buffers. Indeed, the negative spill-overs from services, manufacturing and other productive industries to the financial sector, would have been much more severe if financial entities had not built liquidity and capital buffers over time.

Notes:

[1] Comprising 19 countries and the European Union, the G20 is a forum for economic cooperation. It works to address global issues such as financial stability, climate change mitigation and sustainable development.

2.2 Macro-Financial Risks

Barbados' macro-financial environment presented several challenges during 2020 and the first three months of 2021 as a result of the COVID-19 pandemic. In the macro risk assessment matrix below, the colour codes correspond to varying combinations of likelihood and impact, ranging from high (red) to low (green). The "high" outcomes are determined by several risk factors which have at least one high impact and/or significant likelihood of occurrence.

Based on our assessment of the risk matrix and the direction of risk for the macro financial domestic environment, credit risk constitutes the main risk to the financial system. The factors that might potentially increase credit risk across the financial sector include the potential for continued impairment of the tourism sector, persistently high unemployment, and the transition of the financial system away from the use of moratoria. Section 5 focuses on the implications of this risk.

Table 3: Macro Risk Assessment Matrix as at June 2021

	Credit	Domestic Currency Liquidity	Foreign Currency Liquidity	Interest Rate	Cyber	Operational	Reputational
Economic Environment 2021							
Tourism significantly impacted by COVID-19 in second half of 2021	High	Moderate	Moderate	Low	N/A	N/A	Low
Unemployment remains elevated throughout 2021	High	Moderate	N/A	Low	N/A	N/A	Low
Phasing-out of moratoria by financial institutions	High	Moderate	N/A	Low	N/A	N/A	Low
Inflation accelerates in the second half of 2021	High	Low	Moderate	Low	N/A	N/A	Low
Foreign currency flows by IBCs impacted by global developments in 2021	Low	Low	Moderate	N/A	Low	N/A	Low
Reduction/termination of Government household/employment support schemes	Moderate	Low	Low	N/A	N/A	N/A	N/A
Technology							
Increase e-commerce	Low	Low	Low	N/A	Moderate	Low	Low
Move towards chip and pin (Mastercard & Visa Debit Cards)	N/A	Low	Low	N/A	Low	Low	Low
Increased incidences of cyber hacking/fraud	N/A	N/A	N/A	N/A	High	High	High
Settlement Failure	Low	Low	N/A	N/A	Low	Low	Low
Overall Risk to Financial System	High	Moderate	Moderate	Low	Moderate	Low	Low
Direction of Risk	Increasing	Stable	Stable	Stable	Increasing	Stable	Stable

Source: Central Bank of Barbados

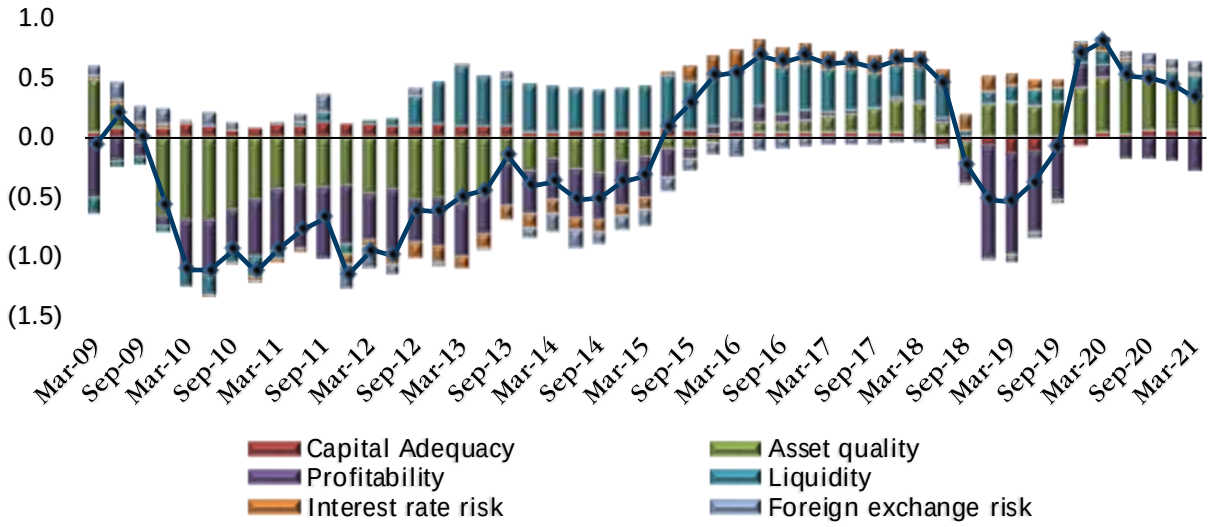
Another risk that has expanded for the financial system is cyber risk especially with the expansion in work-from-home due to the pandemic and the increasing use of e-commerce transactions.

Traditionally, we explore the relative balance between risk and stability using the Banking Stability Index, the Aggregate Financial Stability Index and the Financial Stability

Cobweb[1]. Of these metrics, we have focused mainly on the Banking Stability Index, as this is derived strictly from domestic factors and, given the current circumstances, provided the most reliable measure of risk in the banking system.

The BSI seeks to capture the stability of commercial banks in a single measure by taking a weighted average of banking sector performance indicators, namely, capital adequacy, profitability, asset quality, liquidity, interest rate risk and foreign exchange risk. From end-March 2020, the BSI for Barbados has been deteriorating as indicated by its recent downward trajectory (Figure 1). The worsening of the index stemmed from lower profitability (pre-tax) from core business functions, and higher non-performing loans. Despite the deterioration, the BSI has not returned to negative levels, as was the case from September 2018 to September 2019. During that period, banks suffered losses due to increased provisioning based on the adoption of International Financial Reporting Standards (IFRS) 9 and lower interest income from Government securities following the domestic debt exchange.

Figure 1: Banking Stability Index



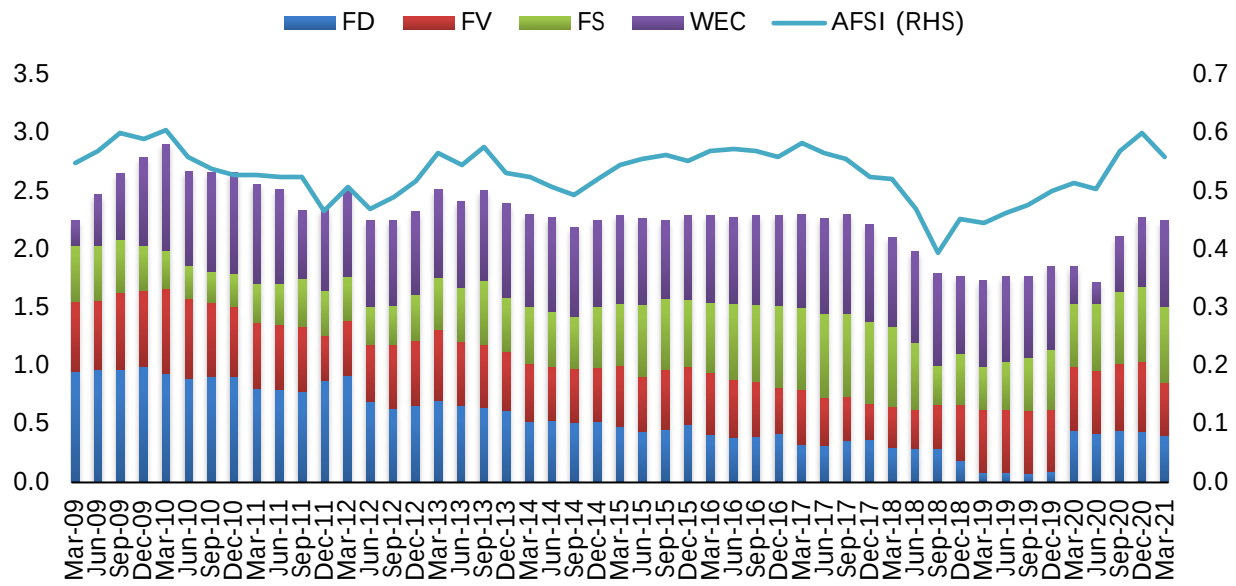
Source: Central Bank of Barbados

The Aggregate Financial Stability Index (AFSI) is another composite measure of financial stability, where an increase in the index suggests there is greater stability within the financial system. Movements in the AFSI are determined by fluctuations in four broad sub-indices, namely, financial development (FD), financial vulnerability (FV), financial soundness (FS), and the world's economic climate (WEC), which the index captures using

[1] Information on the construction of the indicators is presented in Appendix A.

a weighted average approach. However, there are limitations to the use of this index in the current environment because the WEC and FD do not adjust for the COVID shock to tourism and the sharp drop in GDP.

Figure 2: Aggregate Financial Stability Index

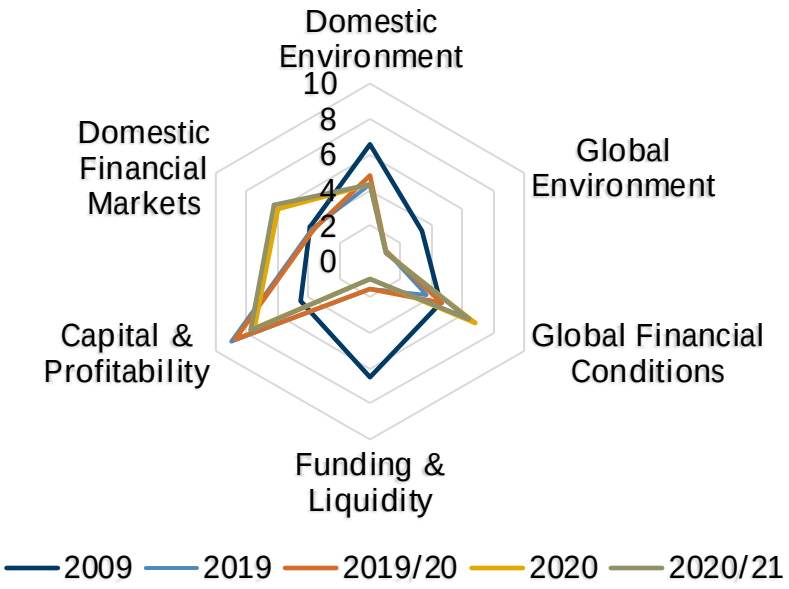


Source: Central Bank of Barbados

Figure 2 shows that during 2020 the AFSI improved relative to 2019, owing to increases in all the sub-indices except WEC, which was driven by a decline in the GDP of advanced economies and increased volatility in international stock markets. Of the three sub-indices that rose, FD as proxied solely by bank credit to GDP, was the strongest driver of the AFSI. Credit in nominal terms actually contracted during 2020 but the ratio to GDP increased, because GDP declined at a faster rate than credit. The AFSI for the first three months of 2021 is shown to be marginally higher when compared to the corresponding period in 2020, due to improvements in WEC and FS that were determined by growth of advanced economies, lower international stock market volatility, capital adequacy and bank liquidity.

Unlike the other two macro-financial metrics, the Financial Stability Cobweb (Figure 3) examines the financial soundness of banks by individually assessing 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 higher 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 2020 and 2020/21 (April 2020 - March 2021) for comparative analysis.

Figure 3: 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.

Lower returns on the Barbados Stock Exchange resulted in higher risk for domestic financial markets. Increased volatility of international stock markets and a wider spread between bonds from emerging market economies and advanced economies indicated greater stress in global financial conditions in 2020 relative to the prior year. The threat to financial stability from the domestic environment remained unchanged compared to 2019, as slower growth in retail prices and improved international reserves relative to broad money, negated the negative impact of the worsened fiscal position on this dimension of financial soundness. Similarly, the risk score for the global environment did not change from 2019, since the improvements in the MSCI World Index of Equity Returns and international oil prices were not sufficient to reduce the risk rating. However, the capital and profitability and funding and liquidity dimensions of the cobweb performed better than they did in 2019, due to higher capital adequacy, after-tax profits and greater liquidity resulting from deposit growth and depressed lending.

When the first three months of 2021 are considered with the use of 2020/21 as the reference year, there are virtually no differences in the risk scores when compared to that of 2020, except for global financial conditions, which decreased on account of improvements in the performance of international stock markets and the JP Morgan Emerging Market Bond Index. However, the results are quite mixed when the comparison is between 2020/21 and 2019/20. The 2020/21 risk scores for domestic financial conditions and global financial conditions were higher than those recorded in 2019/20 for the same reasons the 2020 scores are above the 2019 scores. Risk associated with the

global environment remained on par with that of 2019/20, while the risk scores for domestic environment, funding and liquidity and capital and profitability improved.

The BSI, AFSI and the Financial Stability Cobweb say different things about financial stability during 2020 and the first three months of 2021. The BSI displays a clear deterioration of stability during the aforementioned periods, while the AFSI points to an improvement and the Cobweb analysis appears to be somewhere in the middle, as averages over the six dimensions show no substantive change relative to periods one year earlier. It should be noted that the BSI does not take account of the world's economic and financial climate like the other two measures, as it is strictly based on domestic indicators of financial stability. Thus, the more positive outturn of the AFSI and the Financial Stability Cobweb is due to the fact that the favourable performance of the global indicators masks the weakened loan quality and underlying profitability of resident banks. For this reason, the BSI is the more appropriate gauge of financial vulnerability for 2020 and 2021 since it better reflects the risks that may threaten the domestic banking sector.

2.2.1 Financial System Interconnectedness

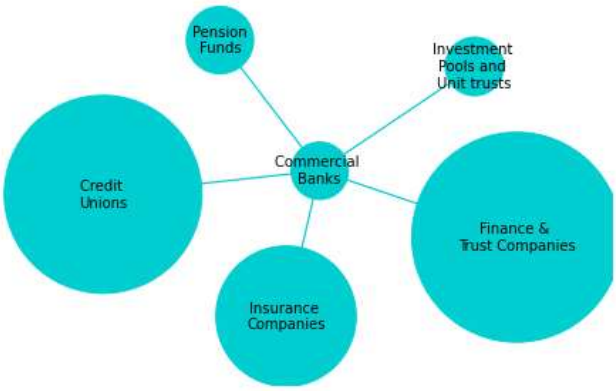
Financial system contagion can occur as failure in one section of the financial system can spread through its interconnected firms, thus creating disturbances that have the potential to adversely impact financial stability.

Contagion risk arises through both direct and indirect linkages. Exposures in direct linkages occur when the financial balance sheets are exposed via interbank markets and bank and non-bank financial institutions' connection failures. For deposit-taking institutions, these direct linkages are typically through loans and deposit balances. Indirect linkage exposures occur when bank runs and fire sales on assets lead to general declines in asset values, even among firms with no direct connection to the distressed firm.

A network analysis was used to assess other financial institutions' exposure to commercial banks and finance and trust companies, relative to their assets. Given their centrality in the payments system, commercial banks remained the main source of interconnectivity in the domestic financial sector, as the financial institutions held substantial assets in the banking system in 2020. However, the exposure to commercial banks was reduced from the previous year, as all financial institutions held smaller balances except credit unions. The credit union sector became the subgroup most exposed to the commercial banks, as they increased their deposits, while the finance and trust companies significantly reduced their deposit holdings compared to 2019. As for deposit-taking finance and trust companies, both insurance companies and credit unions increased their exposures through higher deposits with these institutions (Figure 4).

Figure 4: Network of Institutional Exposures as % of Total Assets (to Commercial Banks and Finance & Trust)

2019



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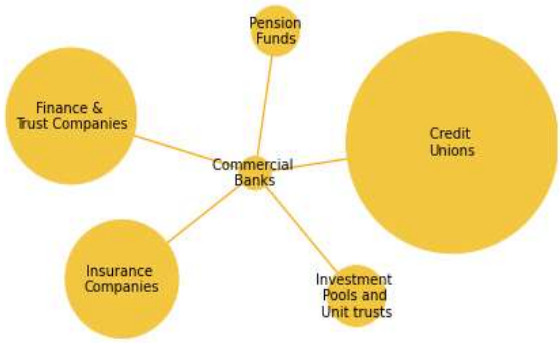
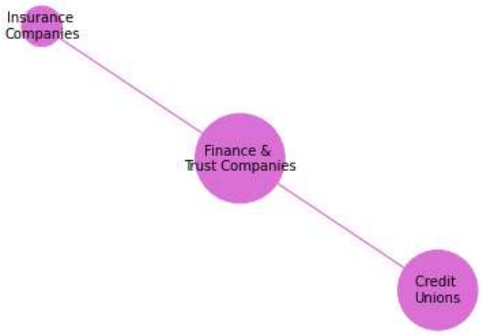


2019



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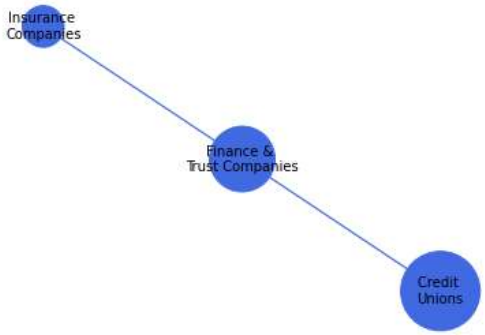


Source: Central Bank of Barbados

Note: Outer nodes represent the subsectors' deposits in the centre node relative to the assets of that financial sub-sector

Box 2: Loan Payment Moratoria Granted by Deposit-taking Institutions in Barbados

The severity of the COVID-19 pandemic on businesses and households led financial institutions to implement relief measures for their customers. For instance, lenders offered borrowers cash flow relief through loan payment moratoria that allowed a deferral of loan payments while interest continued to accrue on outstanding balances.

The initial moratoria periods ranged from three to six months and were intended for customers who faced financial difficulty due to COVID-19 but who were previously in good standing. Loans subject to moratoria were not treated as non-performing during the deferral period. The approaches used by financial institutions varied. For example, some commercial banks rolled out their programmes via blanket deferrals, requiring borrowers to opt-out, while others adopted an opt-in approach, where customers were encouraged to request the moratoria if needed. All blanket deferrals ended during the third quarter of 2020, as institutions assisted financially challenged customers via loan restructuring, refinancing and moratoria on a case-by-case basis. Some borrowers, particularly tourism-related businesses, benefitted from extensions after the second wave of the virus in early 2021.

Given the opt-out approach adopted by some banks, at the end of April 2020, the value of loans under moratoria was $1.9 billion from 67,127 loan accounts, with individuals accounting for the largest share in both value and number of accounts at 77 percent and 98 percent, respectively. Given the loan restructuring efforts of banks and an improvement in the domestic labour market since the first half of 2020, only $211.7 million remained under moratorium at the end of March 2021. Of this $211.7 million, 95 percent were loans owed by non-financial corporations, mainly in the hospitality sector.

Table 1: **Commercial Banks' Moratoria Programme**

	$ Millions				
	April 2020	June 2020	September 2020	December 2020	March 2021
Financial Corporations	0.5	14.7	14.6		
Non-Financial Private Firms	444.5	758.2	810.7	211.0	211.7
Individuals	1,496.6	1162.2	500.0	36.7	10.0
Total Value of Loans Under Moratoria	1,941.6	1,935.1	1,325.3	247.7	221.7
Total No. of Accounts Under Moratoria	67,127	51,918	5,744	468	126

Source: Central Bank of Barbados

At end December, 5,915 credit union members held loans under moratoria. The majority of these loan accounts were in the personal (64.9 percent), followed by line of credit facilities (18.1 percent) and mortgages (14.4 percent). However, in terms of the total value of loans under moratoria, mortgages, personal and line of credit accounted for 55.5, 41 and 2.5 percent, respectively. The credit union moratoria programme represented 13.5 percent of the total value of loans owed to credit unions.

Table 2: **Credit Unions' Moratoria Prog**ramme as at December 31, 2020

Loan Categories	Number of Members Granted Moratoria	Total Value of Loans Under Moratoria ($Millions)
Commercial	10	0.5
Mortgages	854	133.9
Personal	3,838	98.8
Line of Credit	1,068	6.1
Other	145	1.9
Total	5,915	241.1

Source: Financial Services Commission

The total value under moratoria by deposit-taking finance and trust companies peaked in June 2020 at 35.3 percent of total loans, with household loans under moratoria almost twice that of non-financial private sector firms. By the end of the review period, moratoria loans had fallen to less than one percent of total loans extended by the subsector.

Table 3: Deposit-taking Finance & Trust Companies' Moratoria Programme

	$ Millions				
	April 2020	June 2020	September 2020	December 2020	March 2021
Financial Corporations	5.0	5.0			
Non-Financial Private Firms	79.2	84.7	12.6		0.4
Individuals	91.6	160.9	71.7	1.8	5.6
Total Value of Loans Under Moratoria	175.8	250.6	84.3	1.8	6.0
Total No. of Loan Accounts Under Moratoria	2,448	4,342	2,098	40	149

Source: Central Bank of Barbados

Based on evidence from around the world, loan payment moratoria have proven to be a very useful financial stability tool for abrupt crisis situations such as COVID-19. However, it is critical that they are not used to mask deteriorating credit quality, as this could undermine financial stability over the medium term.

3. Financial Sector Developments

3.1 Structure of the Financial System

During 2020, assets in the financial system expanded by 3 percent, to represent 285 percent of GDP (Table 4). Asset growth was experienced in all segments of the financial system, with the exception of finance and trust companies, which registered a marginal decline for the year. Deposit-taking institutions, namely commercial banks and credit unions, continue to lead the increase in assets, with larger cash balances stemming from higher deposits and weak credit growth in the system.

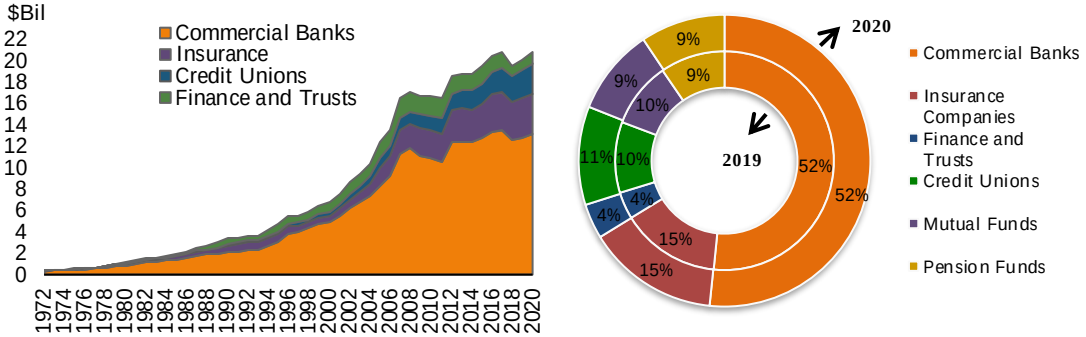
Table 4: **Assets of Financial Services Sector***

$Mil	2015	2016	2017	2018	2019	2020
Commercial Banks	12,774	13,280	13,469	12,662	12,825	13,223
Insurance Companies	3,068	3,424	3,553	3,471	3,649	3,738*
Finance & Trusts Companies	1,647	1,535	1,569	1,016	995	991
Credit Unions	1,879	2,035	2,212	2,422	2,603	2,794
Mutual Funds	1,855	2,004	2,210	2,125	2,411	2,457
Pension Funds	2,061	2,160	2,319	2,345	2,380	2,404
Total	23,284	24,438	25,332	24,041	24,863	25,607

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

There was little change in the distribution of assets in the financial system (Figure 5). Commercial banks continued to dominate the financial system holding 52 percent of total financial assets in 2020, followed by the insurance industry, which accounted for 15 percent. The credit union segment had a modest expansion of 1 percentage point to represent 11 percent of the asset share, while mutual funds' contribution fell to 9 percent. The asset share of pension schemes and finance and trust companies remained unchanged at 9 percent and 4 percent of total assets, respectively.

Figure 5: Assets of the Financial System by Institution[2]



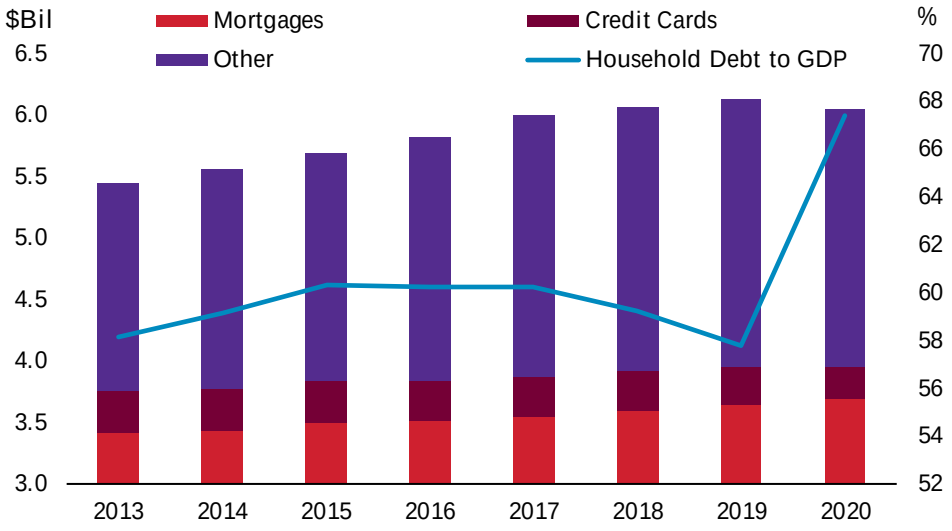
Sources: Central Bank of Barbados and Financial Services Commission

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

The distribution of assets in the commercial banking sub-sector remained unchanged, with the three Canadian banks accounting for 73 percent of total bank assets, while the two Trinidadian banks held the remaining 27 percent. Similarly, assets in the credit union segment remained concentrated with the seven largest of the 33 entities maintaining 93 percent of the segment's asset base. For insurance, the life insurance sector grew in importance to account for 74 percent of that industry's assets, following a reduction in the domestic assets of general insurers over the period.

Assets of the deposit-taking institutions (DTIs) continue to be concentrated in loans. Specifically, credit to households accounted for 71 percent of the sector's total lending at the end of 2020. Additionally, with the ensuing economic contraction from the pandemic, the ratio of household lending to GDP increased by approximately 10 percentage points to represent 67.4 percent of economic activity (Figure 6). Nonetheless, personal loans declined by 1.2 percent for the year, which represented 91 percent of the overall contraction in the loan books of DTIs. This reduction in personal sector credit was driven by lower credit card and other loan balances, while mortgage lending to households continued to increase. A modest growth in personal mortgages was experienced by the credit union segment and, to a lesser extent, finance and trust companies, but commercial banks registered a marginal decline in their mortgage lending to households.

Figure 6: Lending to Households by DTIs



Sources: Central Bank of Barbados and Financial Services Commission

Deposit Insurance

The Barbados Deposit Insurance Corporation (BDIC) continues to promote confidence in the financial system in the face of the pandemic, by guaranteeing each depositor at commercial banks and finance and trust companies up to $25,000 on domestic currency accounts. With increasing deposits in the system, the estimated value of qualified insurable accounts of BDIC increased by 4.2 percent to $10.4 billion at the end of 2020 (Table 5).

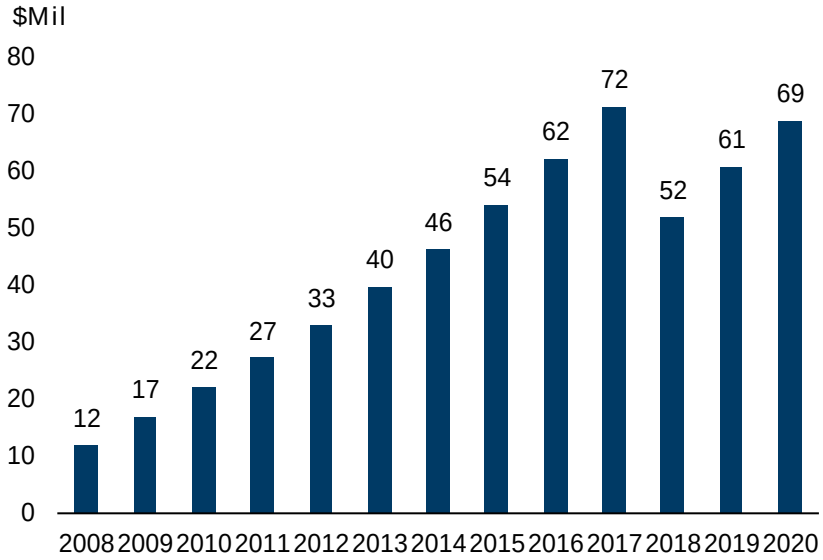
Table 5: **Total Estimated Insurable Deposits**

($ Millions)	2015	2016	2017	2018	2019	2020
Commercial Banks	8,482	8,821	8,836	8,915	9,291	9,740
Non-banks	993	873	907	722	740	714
Total	9,475	9,695	9,743	9,637	10,031	10,454

Source: Barbados Deposit Insurance Corporation

The Barbados Deposit Insurance Fund carried an estimated accounting value of $69 million at the end of 2020, (Figure 7). This represented asset growth of 13.1 percent, which, similar to the previous year, was partly reflected an increase in premiums and interest earned.

Figure 7: Deposit Insurance Fund



Source: Barbados Deposit Insurance Corporation

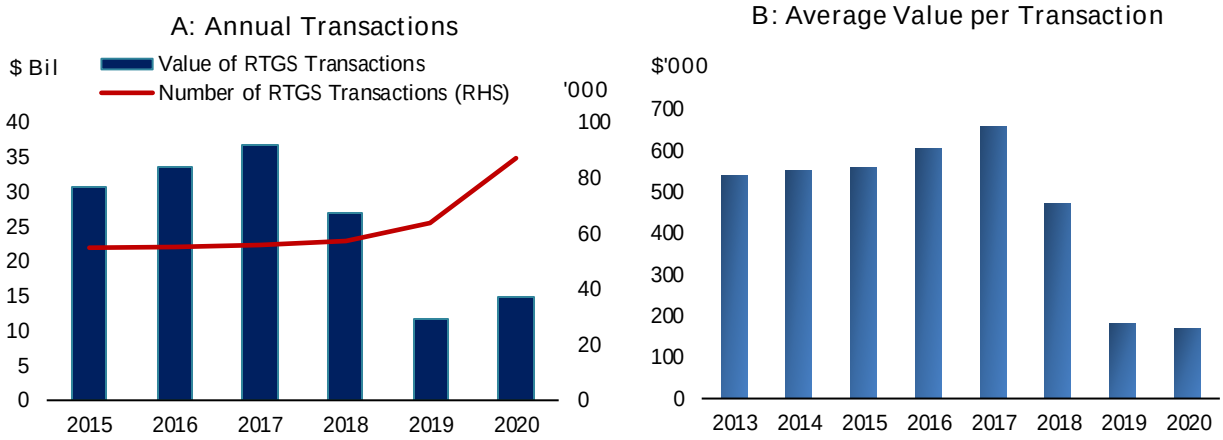
3.2 Payments Systems

The pandemic underscored the importance of having safe and efficient electronic clearing and settlement systems. With the increased demand for contactless payments to reduce the likelihood of virus transmission, Government, businesses and consumers relied heavily on electronic payments to facilitate their operations and transactional needs. Therefore, the Real Time Gross Settlement (RTGS)[3] system and the Barbados Automated Clearing House Services Incorporated (BACHSI)[4] system allowed for effective and robust transaction activity in the financial system.

Payments processed in the domestic market for 2020 increased by 2.8 percent when compared to 2019. This growth was driven by electronic payments through the RTGS system but direct payments through the BASCHI system also rose. At the same time, with depressed economic activity, customer-focused electronic transactions, namely debit card, point-of-sale (POS) and credit card transactions, as well as cheque-based payments, declined over the year. The value of automated teller machine (ATM) transactions contracted, but currency-in-circulation was boosted by financial institutions holding more cash on hand.

For 2020, the volume and value of transactions processed through the RTGS system increased by 36.4 percent and 26.6 percent, respectively (Figure 8A). These gains were largely due to transactions related to land tax and other payments by Government which may have otherwise been facilitated via cheque or cash prior to COVID-19. Consequently, the average value per RTGS transaction fell by 7.2 percent (Figure 8B).

Figure 8: RTGS Transactions

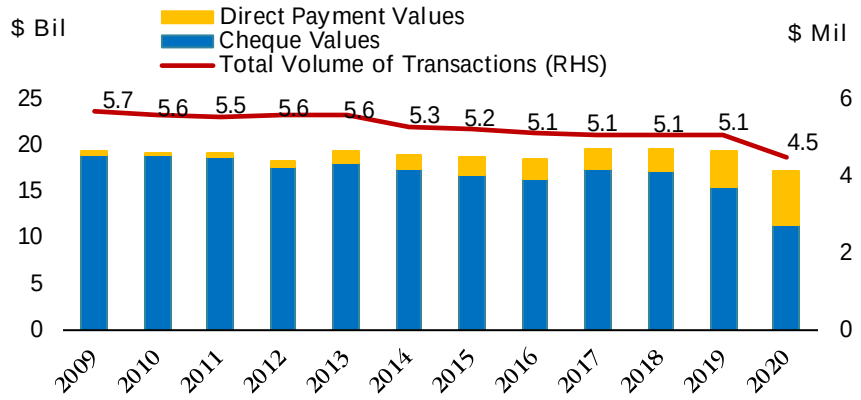


Source: Central Bank of Barbados

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

The value of transactions processed through the BASCHI system fell by 10.5 percent for 2020, (Figure 9). Cheque payments fell by $4 billion, as Government continued its multi-year effort to reduce paper-based transactions. Therefore, the National Insurance Scheme increased direct lodgements to facilitate easier access to benefit payments. Consequently, the value of direct payments grew by $2.1 billion to account for 33.9 percent of total payments through the BASHI system in 2020, compared to 19.2 percent one year earlier.

Figure 9: BASCHI Transactions



Source: Central Bank of Barbados

After steady growth over the past five years, POS payments and Automated Teller Machine (ATM) transactions contracted moderately during 2020 (Figure 10). The value of POS and ATM transactions fell by 2.3 percent and 12.5 percent, respectively. These declines were driven by the national shutdown and layoffs which curbed consumer demand.

Similarly, domestic credit card transactions also declined by 12.6 percent (or $92.8 million) in 2020 (Figure 11). This fall-off was registered in both the personal and business sectors, with individual consumers accounting for $84.4 million of the decline, while business transactions fell by $8.4 million.

Figure 10: Debit Card Transactions

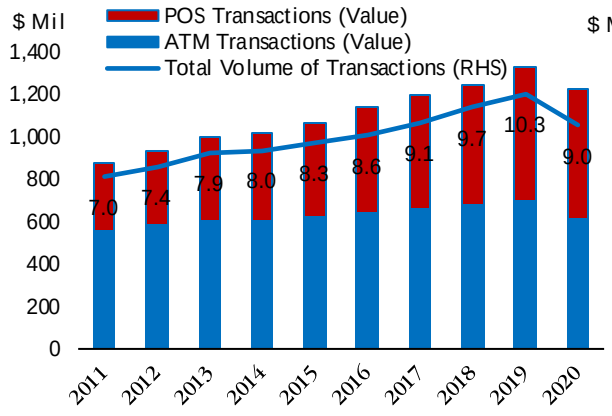
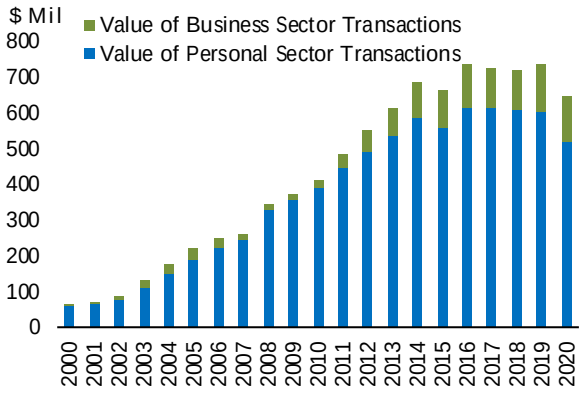


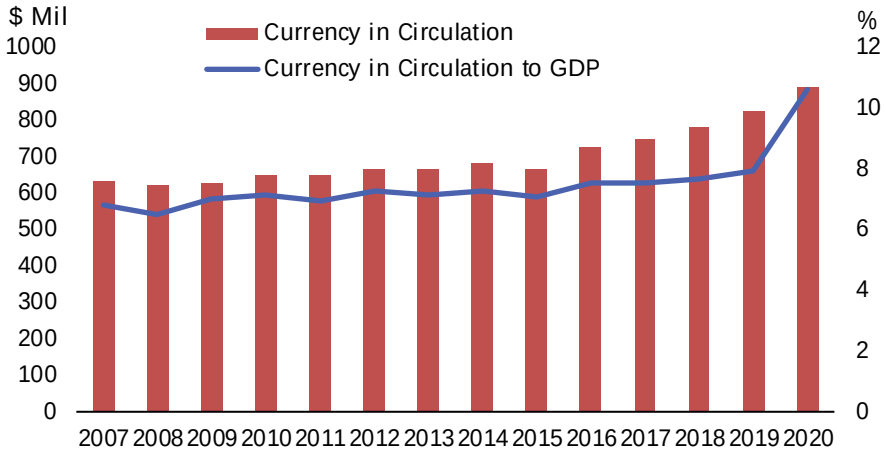
Figure 11: Credit Card Transactions



Source: Central Bank of Barbados

Currency-in-circulation expanded by 7.4 percent during 2020, to account for 10.6 percent of GDP (Figure 12). This outturn was driven by increased cash holdings of financial institutions to meet liquidity needs and to service the higher demand for cash by customers during the pandemic.

Figure 12: Currency in Circulation



Source: Central Bank of Barbados

Box 3: Developments in the Payment System

The domestic payments landscape is undergoing change. In February 2021, the Barbados National Payment System Bill was passed in Parliament. This Act allows for more effective oversight and regulation of the payments system and its operators through the provision for licensing payment system participants and the establishment of a clear set of rules. It is hoped that the new framework will boost innovation in the payments space by encouraging the increased use of various forms of electronic payments in Barbados.

Under the Act, the Central Bank is tasked with the responsibility for oversight, regulation and development of the Barbados payment system, to ensure robust activity while maintaining financial stability. To aid in this role, a broad-based National Payment System Council will provide advice to the Central Bank.

In the financial market, deposit-taking institutions are in the process of changing over from the domestic CarIFS network to the international VISA or MasterCard networks for their debit cards services. This shift is intended to provide a more secure platform for card transactions through the adoption of chip and pin cards, and is expected to support the growth of online transactions. The transition will raise the cost of some services provided by financial institutions, and the Bank has been evaluating options for regulatory intervention to minimise the impact on users of financial services.

Work continues on the upgrade of the ACH system to accommodate real time payments for direct debits. This framework creates the potential for financial institutions to offer alternative payments options, including through increased use of mobile transactions. Credit unions are also preparing to participate on the upgraded platform. The roll-out is expected to be phased, beginning in the last quarter of 2021. To facilitate reduced clearing times for cheques, reforms to the cheque clearing process are also expected to come on-stream later in the year. These changes will replace the presentation of physical cheques with cheque images in the clearing process. It is anticipated that this will reduce the time it takes to clear cheques and allow customers to have faster access to funds received via this method of payment.

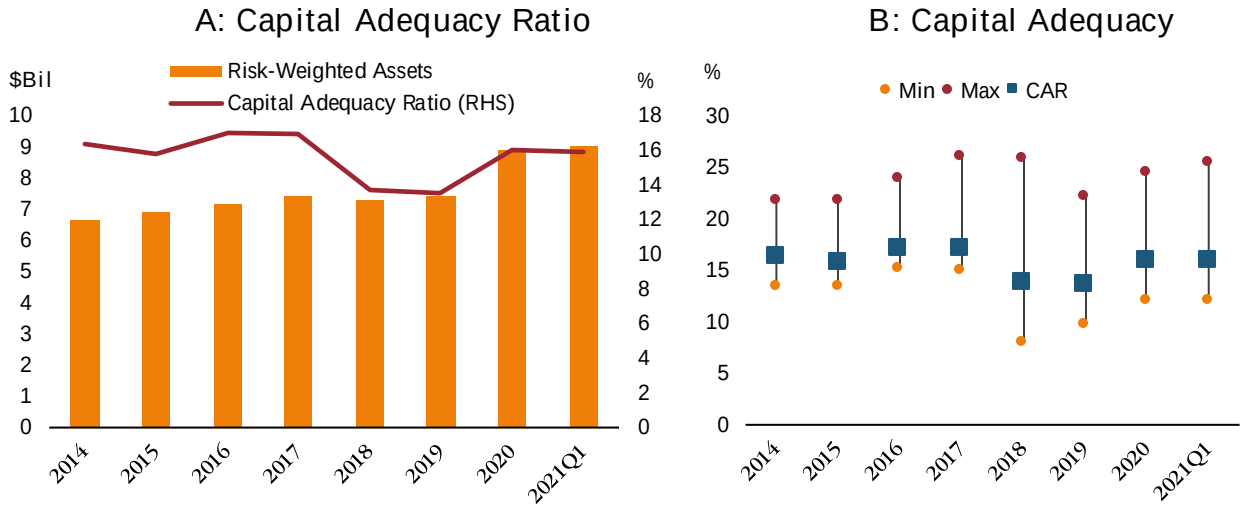
Government is continuing its policy shift towards electronic payments. During 2020, Government's EZPay+ payments platform allowed individuals to pay their land tax or make NIS contributions using online payment options. Payments for driver's licences commenced during third quarter of 2021, while payment provision for other services is on the horizon.

4. Analysis of the Financial System

4.1 Commercial Banks

The pandemic influenced the performance of the banking system in 2020 but the sector remained stable. During the review period, commercial banks remained well capitalised. The sector's capital adequacy ratio (CAR) rose to 16.0 percent, partly driven by the conversion of a bank from a branch to a subsidiary (Figure 13A). However, absent the conversion, the underlying CAR steadily increased from 13.5 percent to 14.3 percent, as banks rebuilt regulatory capital, in particular Tier 1 capital. All individual banks remained well above the 8 percent benchmark level with ranges between 12.1 percent to 24.6 percent at the end of 2020 (Figure 13B).

Figure 13: Capital Adequacy



Source: Central Bank of Barbados

The improved capital adequacy reflects the strengthening of the sector's after-tax profitability (Figure 14A) and the rising share of zero risk weighted assets, resulting from claims on the Central Bank rather than loans to the private sector. Pre-tax profitability weakened as fee and other income fell significantly as fees associated with loans and advances and non-loan fees were down. Furthermore, net interest income contracted by 6.6 percent due to declines in loans to the non-financial private sector and deposits in banks abroad. In addition, non-interest expenses rose sharply owing primarily to the increased loan provisioning, but operating expenses decreased for the first time since 2014 (Figure 14B).

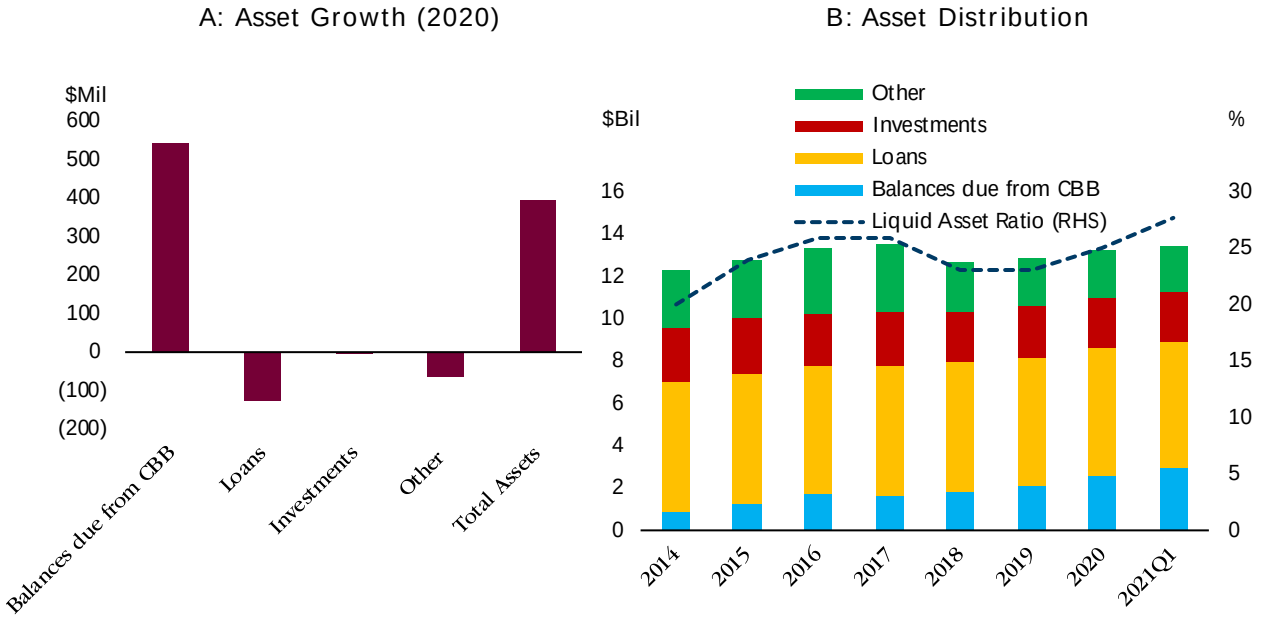
The after-tax return on assets (ROA) of 0.8 percent was an increase of 20 basis points from the previous year where the one-time write-off of deferred tax assets following the reduction in corporate tax rates depressed after-tax profitability (Figure 14C).

Figure 14: Profitability

Source: Central Bank of Barbados

Commercial bank assets increased by 3.1 percent during 2020, slightly faster than the previous year. However, with customer deposits maintaining a moderate growth path and loans continuing on a downward trend, commercial bank deposits at the Central Bank of Barbados continued to rise (Figure 15A). As a result, commercial banks' liquid assets ratio continued to trend upwards (Figure 15B)

Figure 15: Total Assets



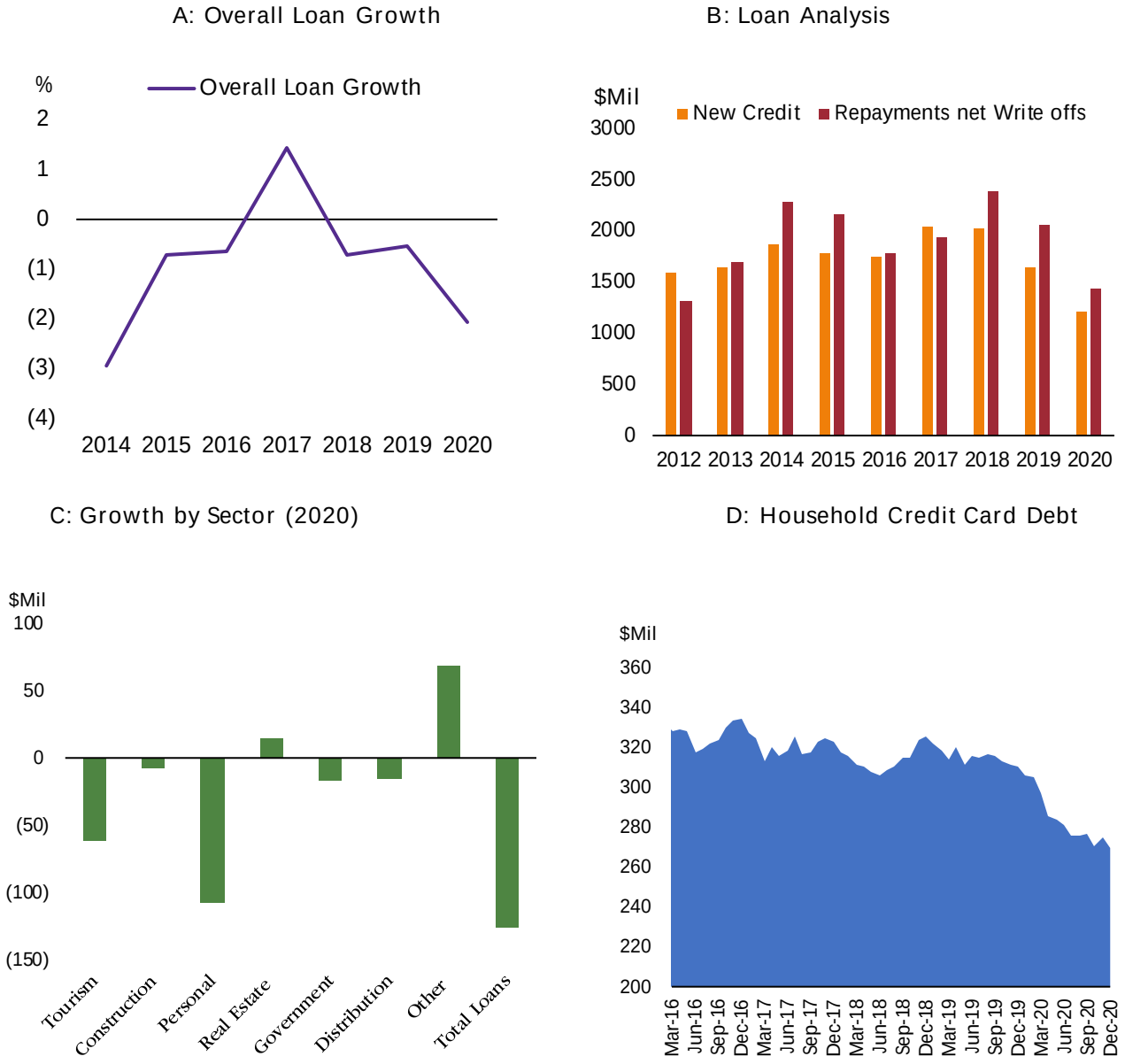
Source: Central Bank of Barbados

Total loans fell by 2 percent (Figure 16A). New credit declined by over $510 million, but repayments also slumped as banks offered loan moratoria of up to six months to customers affected by COVID-19, in anticipation of a deterioration of loan portfolios (Figure 16B). At its peak, 38.2 percent of loans provided by banks were subject to moratoria. However, by March 2021, most of these loans returned to a normal payment pattern or were restructured to provide cash flow relief to borrowers.

The decline in loans was mainly driven by the personal sector, with household credit-card debt falling by 13.4 percent, a likely reflection of the dip in overseas travel (Figure 16C). Loans to the tourism sector recorded a 16.1 percent reduction, mainly owing to the early repayment of a foreign-currency loan by a hotel group during the first quarter of 2020. However, there was increased lending to utilities, public sector corporations and the real estate sector (Figure 16D).

Over the first three months of 2021, total loans remained depressed, falling by 1.7 percent. The decline in the personal and real estate sectors outweighed new credit extended to the tourism sector, which also continued to benefit from moratoria.

Figure 16: Loan Profile



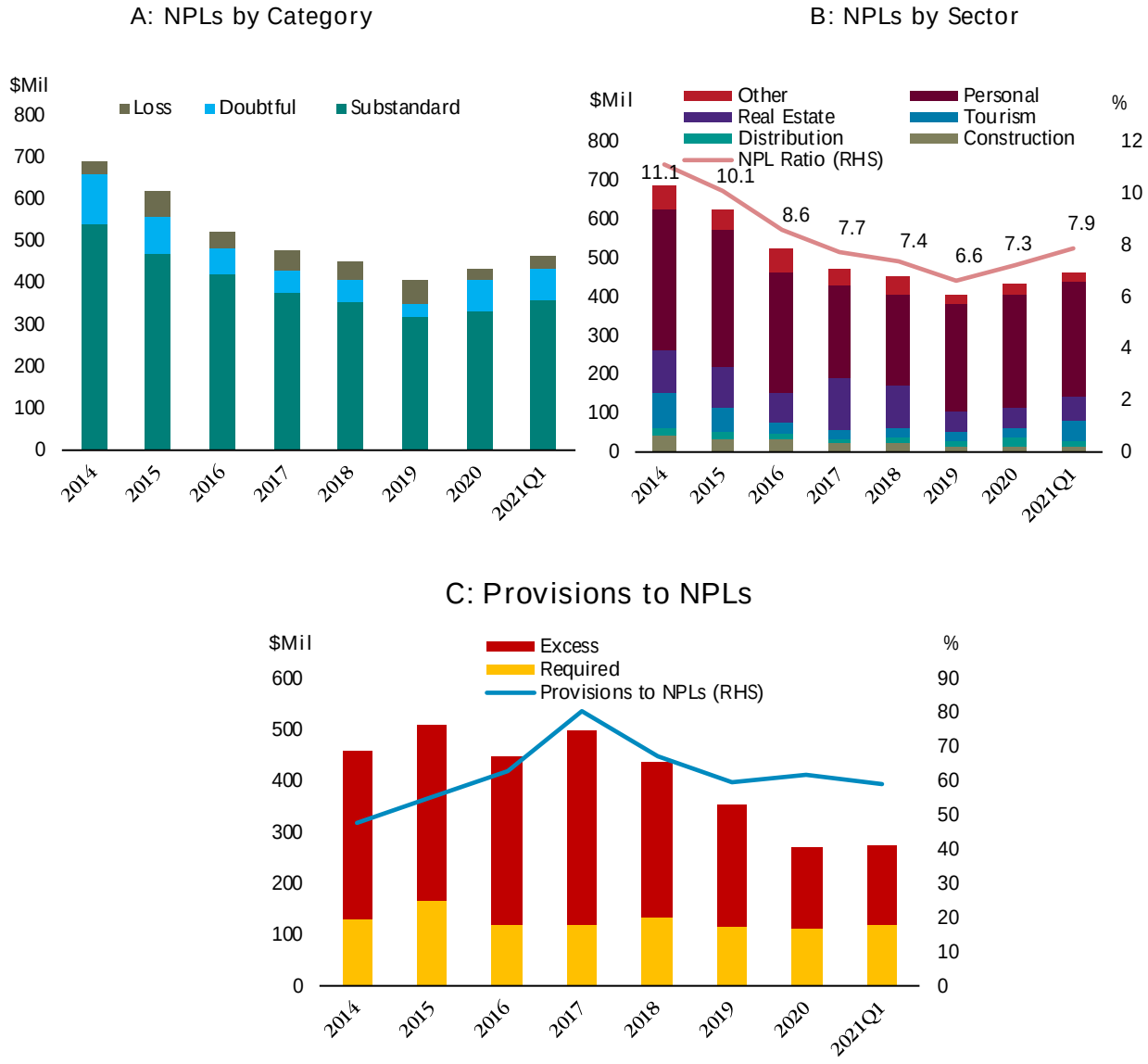
Source: Central Bank of Barbados

Loans in the moratoria programme were not classified as non-performing and at the end of 2020, the NPL ratio stood at 7.3 percent, a 0.7 percentage point increase from 2019 (Figure 17A). In relation to the sectoral distribution of NPLs, increased personal, tourism and distribution loans were recorded as non-performing loans in 2020 (Figure 17B).

As the temporary support to customers wound down, the reported credit quality started to deteriorate in early 2021 and during the first quarter of 2021, the NPL ratio rose to 7.9 percent as the value of tourism-based NPLs expanded.

Provisions to NPLs grew from 59.4 percent to 62.0 percent in 2020, as banks raised their reserves to protect against losses from the expected rise in loan defaults (Figure 17C).

Figure 17: Non-Performing Loans Profile

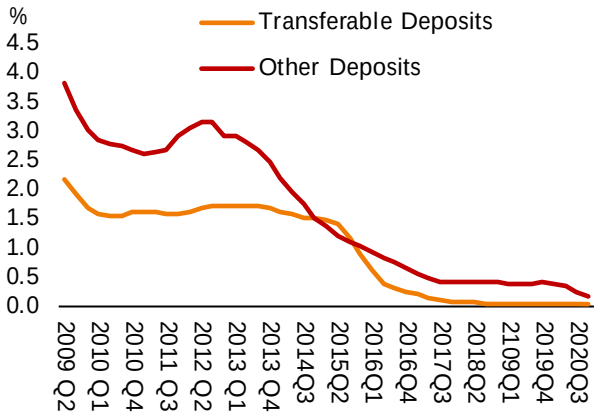


Source: Central Bank of Barbados

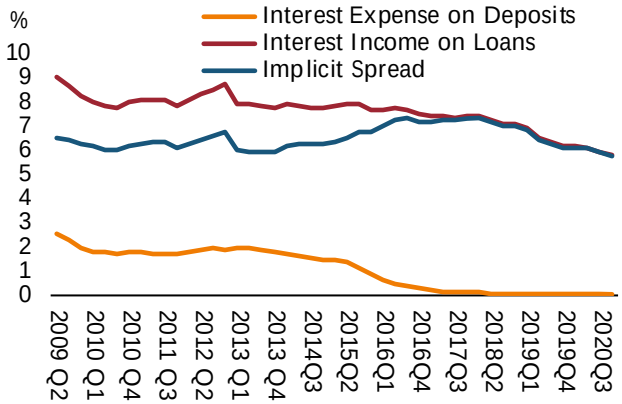
The low deposit interest rate environment persisted into 2020. Interest paid on transferable deposits stood below 0.1 percent, while the expense on "other deposits" edged downward to 0.4 percent (Figure 18A). As the share of transferable deposits expanded, the effective interest rate on deposits was virtually zero, while the effective rate on loans edged downwards to 5.8 percent as the interest income on loans contracted. Thus, the implicit spread was 5.8 percent (Figure 18B).

Figure 18: **Commercial Banks'** Effective Interest Rates

A: Interest Rates by Deposit Type



B: Interest Income and Expense

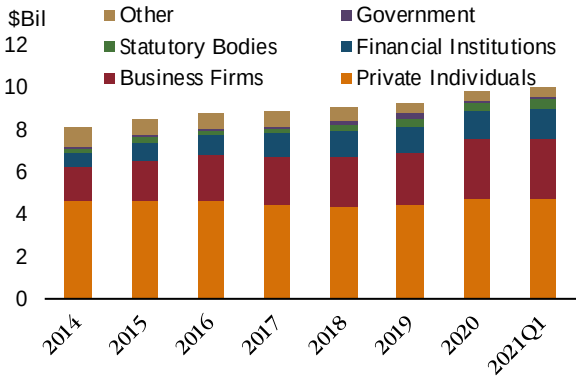


Source: Central Bank of Barbados

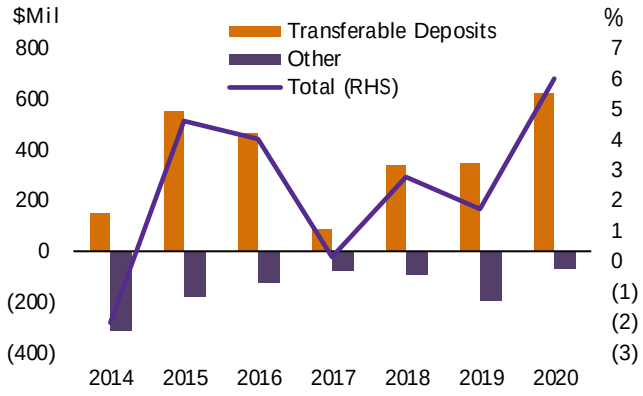
Domestic-currency deposits recorded a 6 percent growth in 2020 as individuals and the business sector's holdings rose, largely reflecting the positive effects of the moratoria on savings and the relaxed fiscal stance (Figure 19A). Transferable deposits continued to be the domestic deposit of choice, as they accounted for 95.9 percent of total domestic-currency deposits, as lower interest rates on fixed deposits made such accounts less attractive (Figure 19B)

Figure 19: Domestic-Currency Deposits

A: Deposits by Holder



B: Changes in Deposit Type

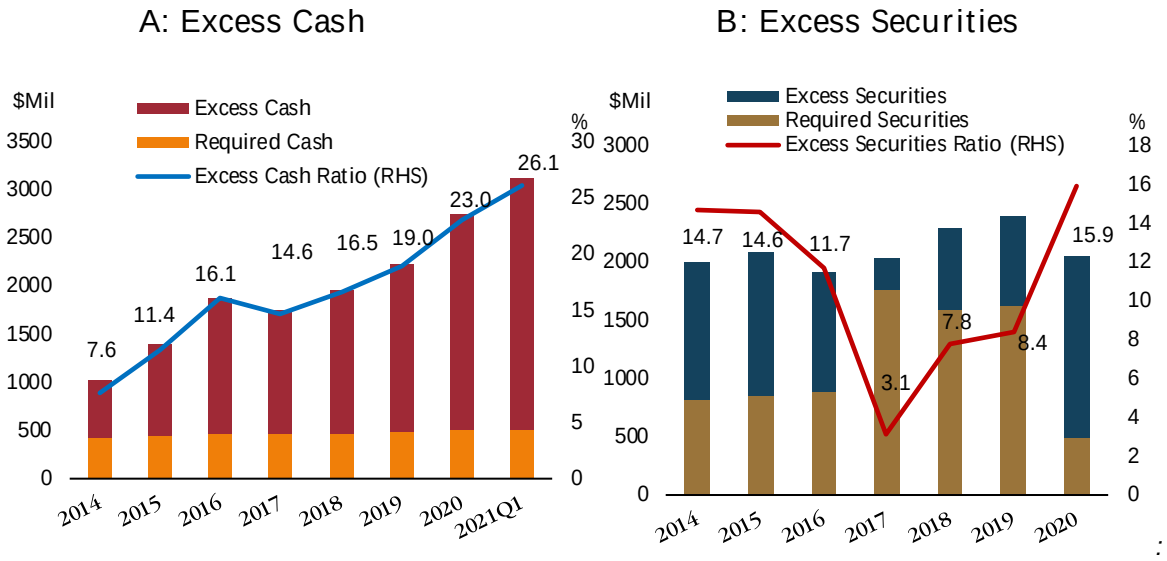


Source: Central Bank of Barbados

Liquidity significantly expanded throughout 2020 and into the first quarter of 2021. The excess cash ratio rose from 19 percent to 23 percent during 2020, as banks increased their cash holdings in relation to deposits (Figure 20A). The excess securities ratio increased as the required securities ratio fell from 17.5 percent to 5 percent in April, 2020

(Figure 20B). This policy measure was discontinued with the passage of the new Central Bank of Barbados Act in December. In the first quarter of 2021, the excess cash ratio reached 26.5 percent.

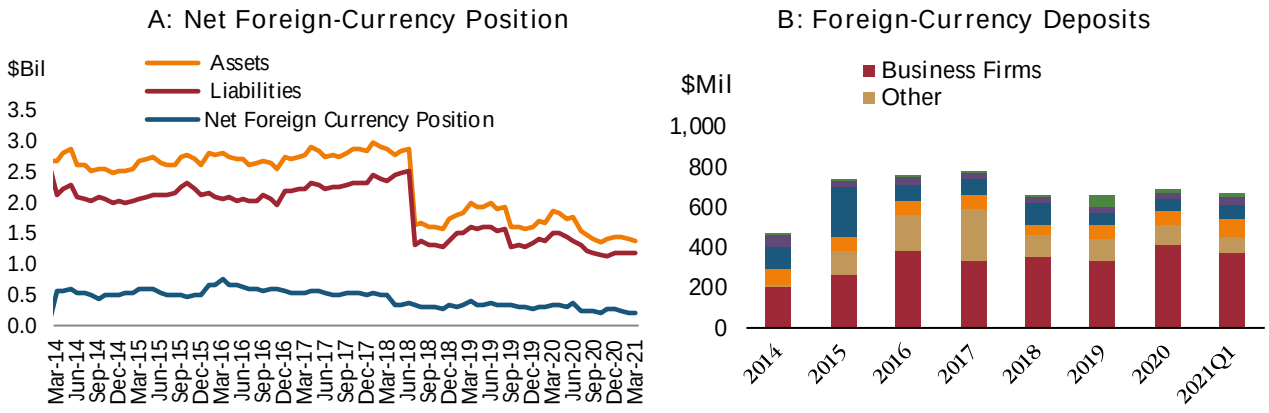
Figure 20: Excess Liquidity



Source: Central Bank of Barbados

The net foreign currency position suffered a modest deterioration during 2020, principally due to the reduction in foreign currency loans which now account for 1.8 percent of the total loans (Figure 21A). Foreign currency deposits grew by 4.3 percent, raising their share of total deposits to 6.6 percent. This increase was boosted by the business sector, real estate, renting and other business activity in particular (Figure 21B). Commercial banks maintained adequate levels of foreign exchange for trading as evidenced by minimal purchases from the Central Bank in 2020.

Figure 21: Foreign-Currency Positions



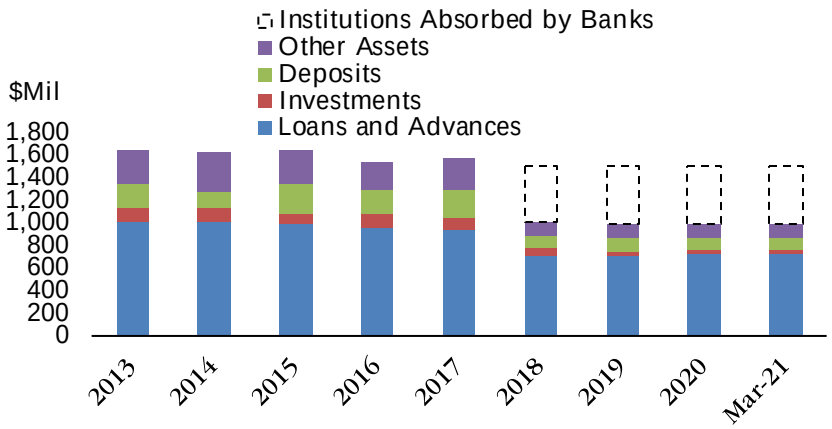
Source: Central Bank of Barbados

4.2 Deposit-Taking Finance and Trust Companies

Following the consolidations of 2018 and 2019, the sub-sector of deposit -taking finance and trust companies now consist of four financial institutions. As for other financial institutions engaged in deposit-taking and loan activity, the fallout from COVID-19 forced institutions to work closely with their customers in an attempt to weather the global pandemic.

Total assets experienced year-on-year declines of $4.7 million during 2020 and $7.7 million during the first quarter of 2021. This downward trend was seen across all asset classes except for investments in securities, shares and other equity. The net effects were 0.5 and 0.8 percent declines in 2020 and over first three months of 2021, respectively (Figure 22).

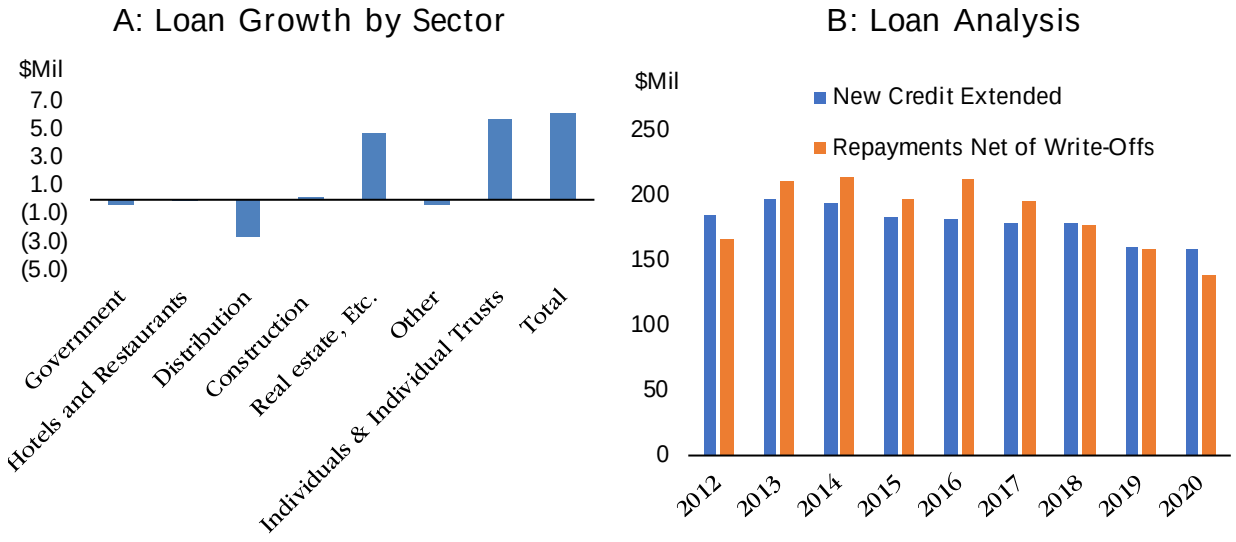
Figure 22: Asset Distribution



Source: Central Bank of Barbados

Loans increased by 2.8 percent during 2020 but fell marginally over the first quarter of 2021. The 2020 outturn was mainly a result of a modest increase in mortgage lending to households which raised lending to private individuals. Loans for real estate also registered modest growth (Figure 23).

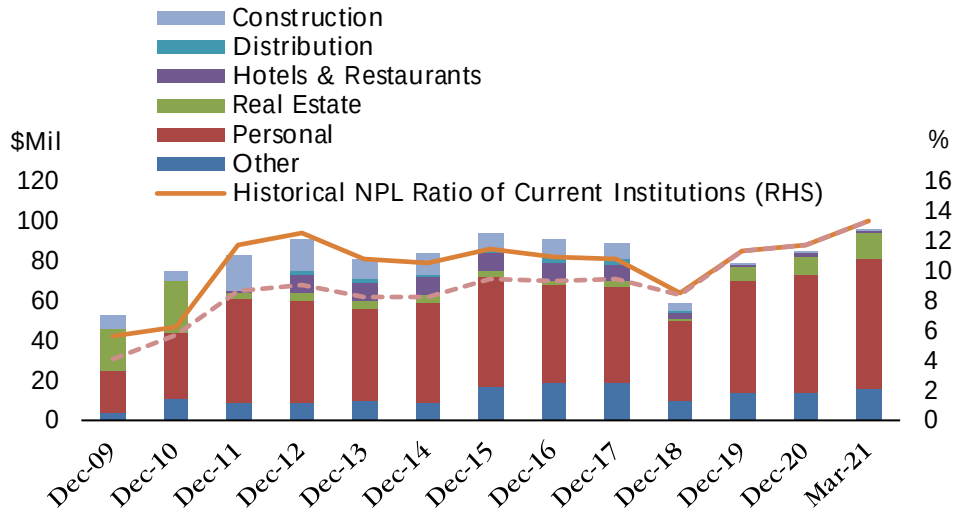
Figure 23: Underlying Loan Growth by Sector



Source: Central Bank of Barbados

Loan payment moratoria programmes in 2020 lessened the impact of the pandemic on the NPL ratio, which was 11.7 percent at December 2020, compared to 11.3 percent one year earlier. However, a second wave of the pandemic in the first quarter of 2021 resulted in a further increase to 13.3 percent, at March 2021. In 2020, loans to individuals and to the real estate sector were the main drivers of this increase in delinquency at $6.7 million and $6.6 million, respectively (Figure 24).

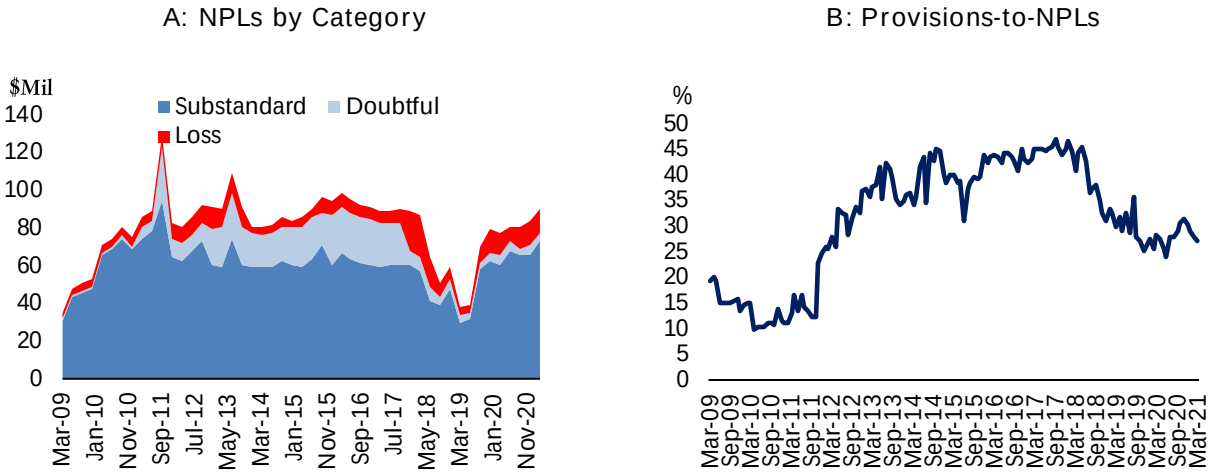
Figure 24: Non-Performing Loans by Sector



Source: Central Bank of Barbados

The broad distribution of NPLs across risk categorisations remained virtually unchanged up to March 2021, compared to former years. Approximately 81.2 percent of impaired loans fell into the "substandard" classification, while, 4.3 percent and 14.5 percent were in the "doubtful" and "loss" classifications, respectively (**Figure 25A).** Provisions for non-performing loans slipped to 27 percent, down from 28.1 percent at March 2020 (**Figure 25B).** This level of provisioning is consistent with regulatory requirements associated with the "substandard" classification carried by most impaired loans.

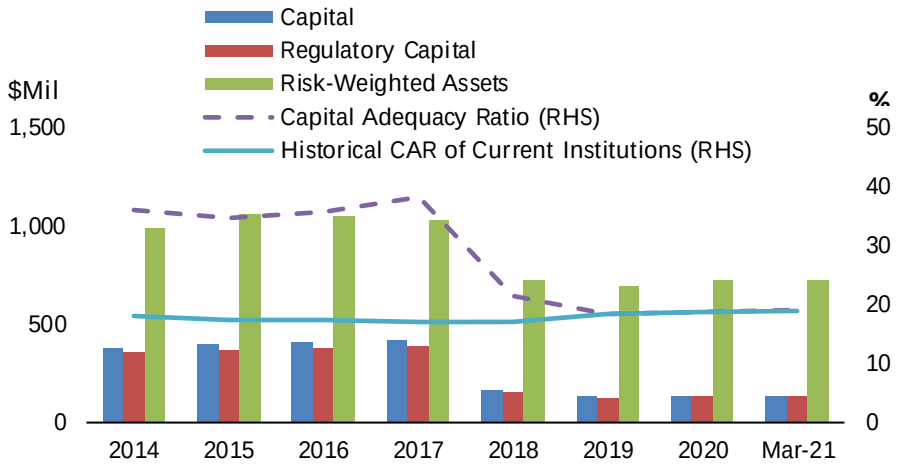
Figure 25: Non-Performing Loans & Provisioning



Source: Central Bank of Barbados

The sub-sector's CAR improved marginally to 18.9 percent at March 2021, up from 18.4 percent one year earlier (**Figure 26**). The profitability of the sector deteriorated as measured by the return on assets which fell from 1.6 percent to 0.7 percent

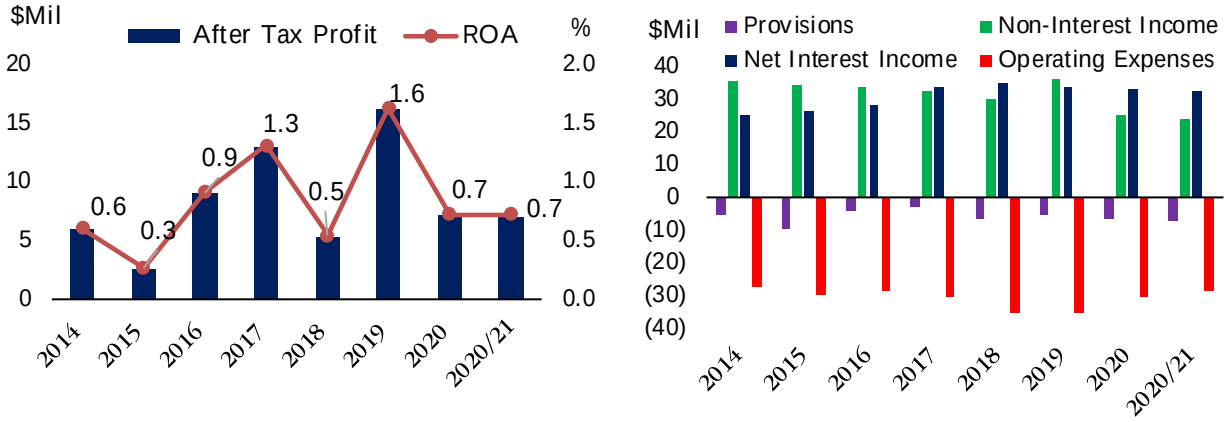
Figure 26: **Capital Adequacy**



Source: Central Bank of Barbados

at December 2020, and remained unchanged at March 2021 (**Figure 27**). Operating expenses contracted, but a decrease in non-interest income largely attributed to smaller earnings from foreign exchange operations, fees and commissions contributed to the weaker performance.

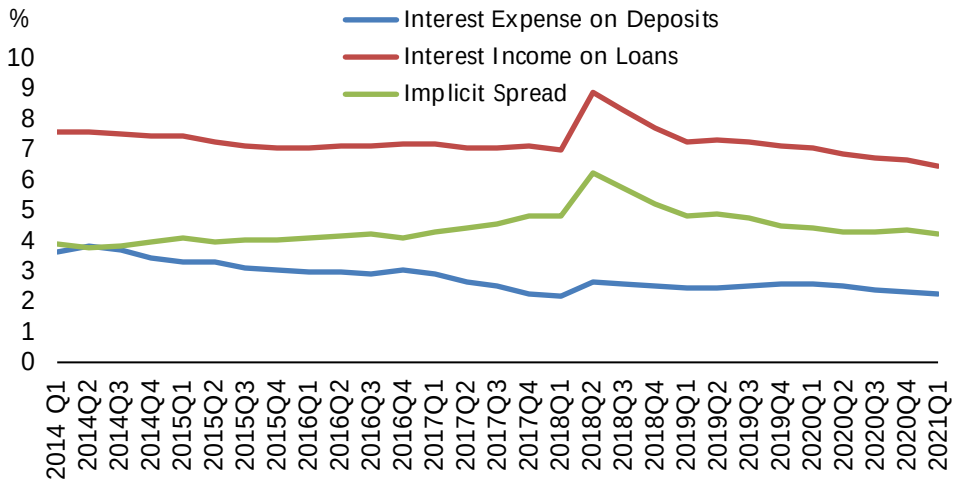
Figure 27: **Profitability**



Source: Central Bank of Barbados

The decline in profitability was also affected by the compression of net interest income. The effective loan rate continued its gradual decline to 6.5 percent at March 2020 from 7.1 percent at December 2019. Meanwhile, the effective deposit rate also declined slightly to 2.2 percent, in the face of generally high levels of liquidity **(Figure 28)**.

Figure 28: Underlying Implicit Interest Rates

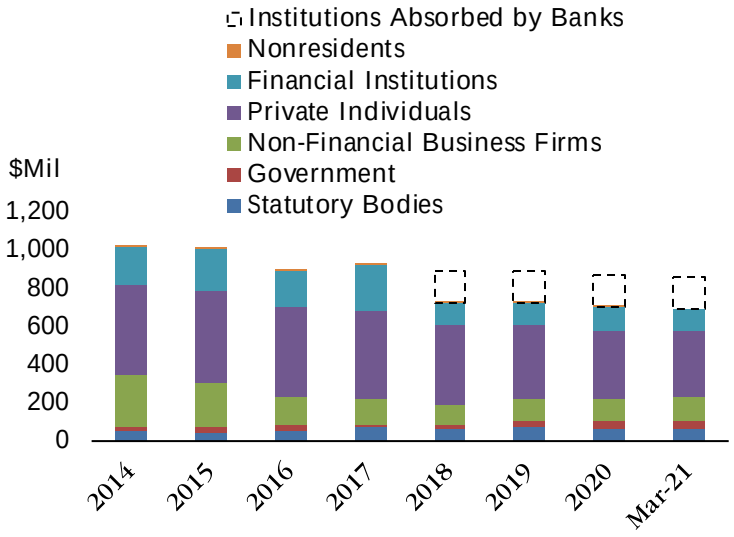


Source: Central Bank of Barbados

Deposits at finance and trust companies continued to edge downward over the past year. Total deposits declined from $721.6 million in 2019 to $713.3 million and $705.4 million at December 2020 and March 2021, respectively. This decline was due to these institutions reducing interest rates in line with market trends and a reduction in balances held by the

hospitality sector. The general distribution of these deposits remained largely unchanged with half belonging to private individuals (Figure 29).

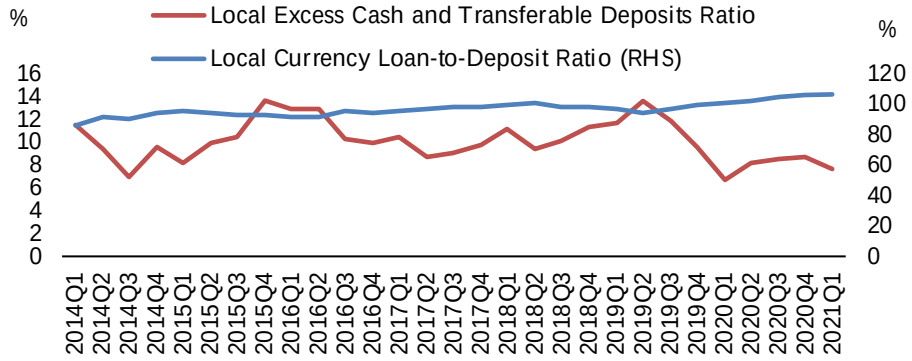
Figure 29: Deposits by Holder



Source: Central Bank of Barbados

The trends in loans and deposits dampened liquidity among deposit-taking finance and trust companies. Excess local cash and domestic-currency transferable deposits in other financial institutions as a percentage of domestic-currency deposit liabilities declined from 9.6 percent at December 2019 to 8.7 percent at end-December 2020 and to 7.6 percent at March 2021. The loan-to-deposit ratio increased from 101.2 percent in the first quarter of 2020 to 106.3 percent one year later, also reflecting a reduction in liquidity (**Figure 30**).

Figure 30: Liquidity Indicators



Source: Central Bank of Barbados

4.3 Credit Unions

Total assets of the credit union sector continued to grow during 2020, rising by 7.3 percent on the basis of steady growth in member savings (Figures 31 & 32). This asset growth was largely reflected in increased liquid assets in the form of cash and short-term deposits. Gross loans, which accounted for an estimated 65 percent of total assets, registered modest growth.

Figure 31: Assets of the Credit Union Sector

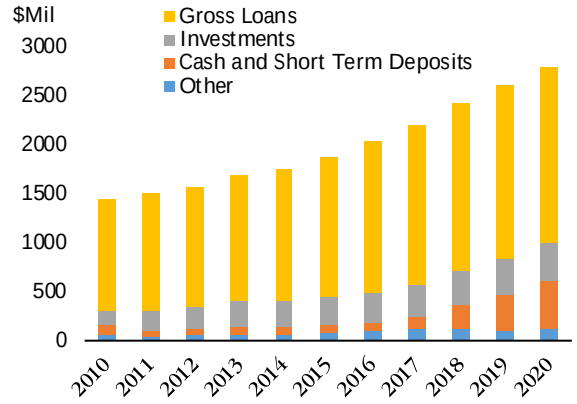
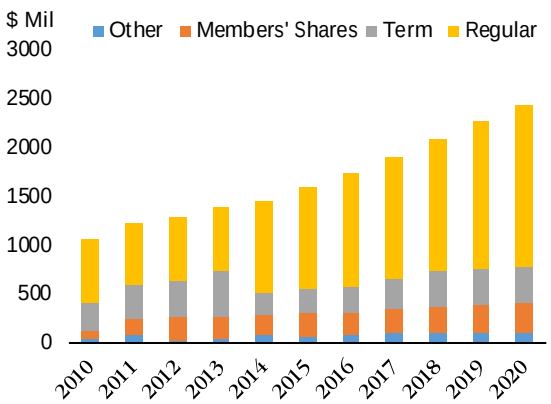


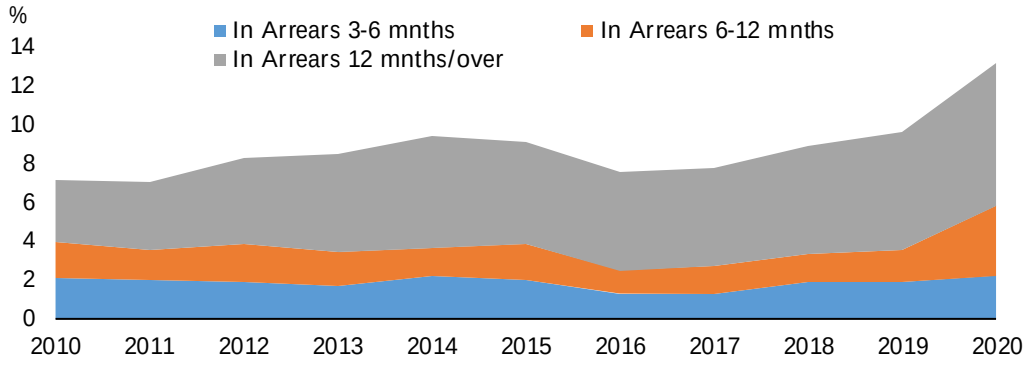
Figure 32: Members' Savings



Source: Financial Services Commission

NPLs accounted for 13.1 percent of the total loans at the end of 2020, an increase of 3.5 percentage points (Figure 33). This upward movement was mostly driven by a further deterioration in the loan portfolio as the value of loans now being recorded as NPLs in the 3-6-month category increased. The large stock of NPLs in the 12-month-and-over category is mostly comprised of collateral-backed mortgages and real estate.

Figure 33: NPLs % of Total Loans

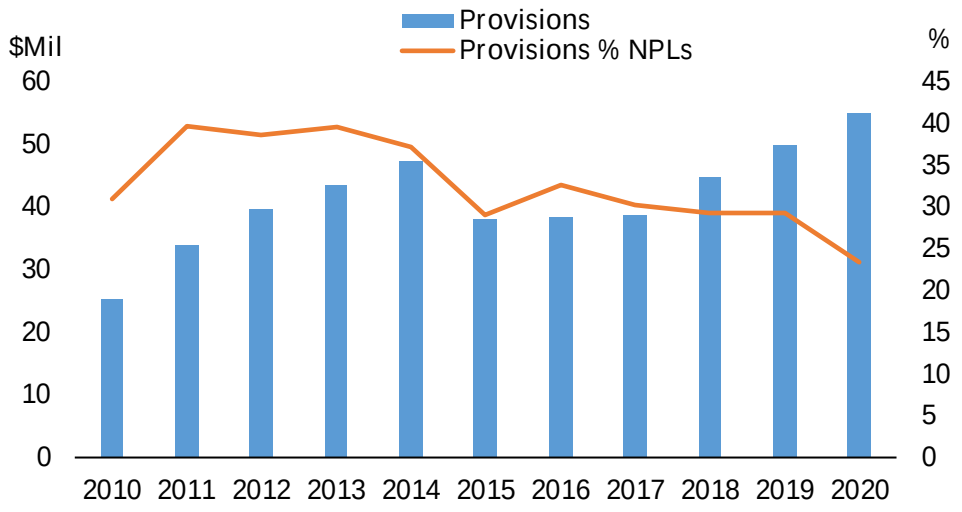


Source: Financial Services Commission

Credit unions continued to adapt to the IFRS 9 standard of provisioning for losses. For the year ended December 2020, the level of provisioning rose by 10.6 percent to reach approximately $55.1 million.

The provision to NPL ratio fell to 23.4 percent, given that a larger increase was seen in the absolute value of NPLs during the period (Figure 34).

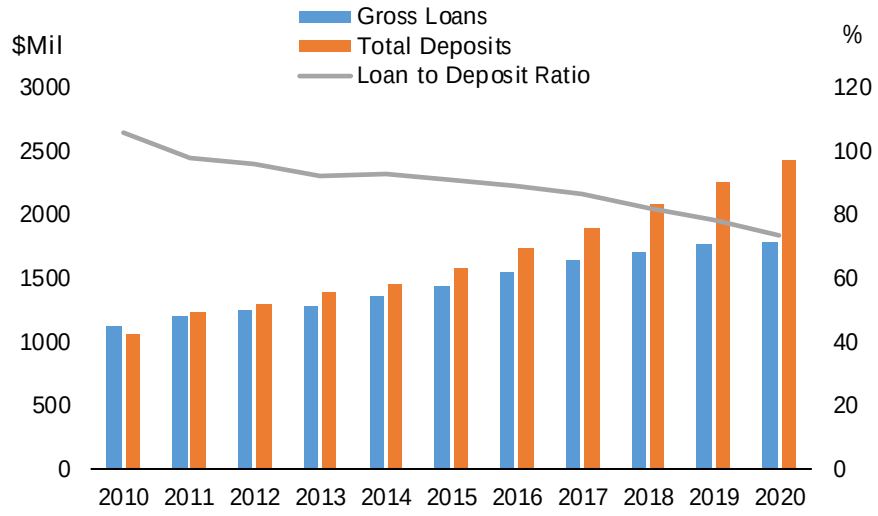
Figure 34: Provisions (% of NPLs)



Source: Financial Services Commission

Liquidity continued to improve during the review period, as evidenced by a lower loan-to-deposit ratio and higher share of liquid assets in total assets. In 2020, the deposit-to-loan ratio fell to 73.5 percent, down from 78.4 percent in 2019 (Figure 35).

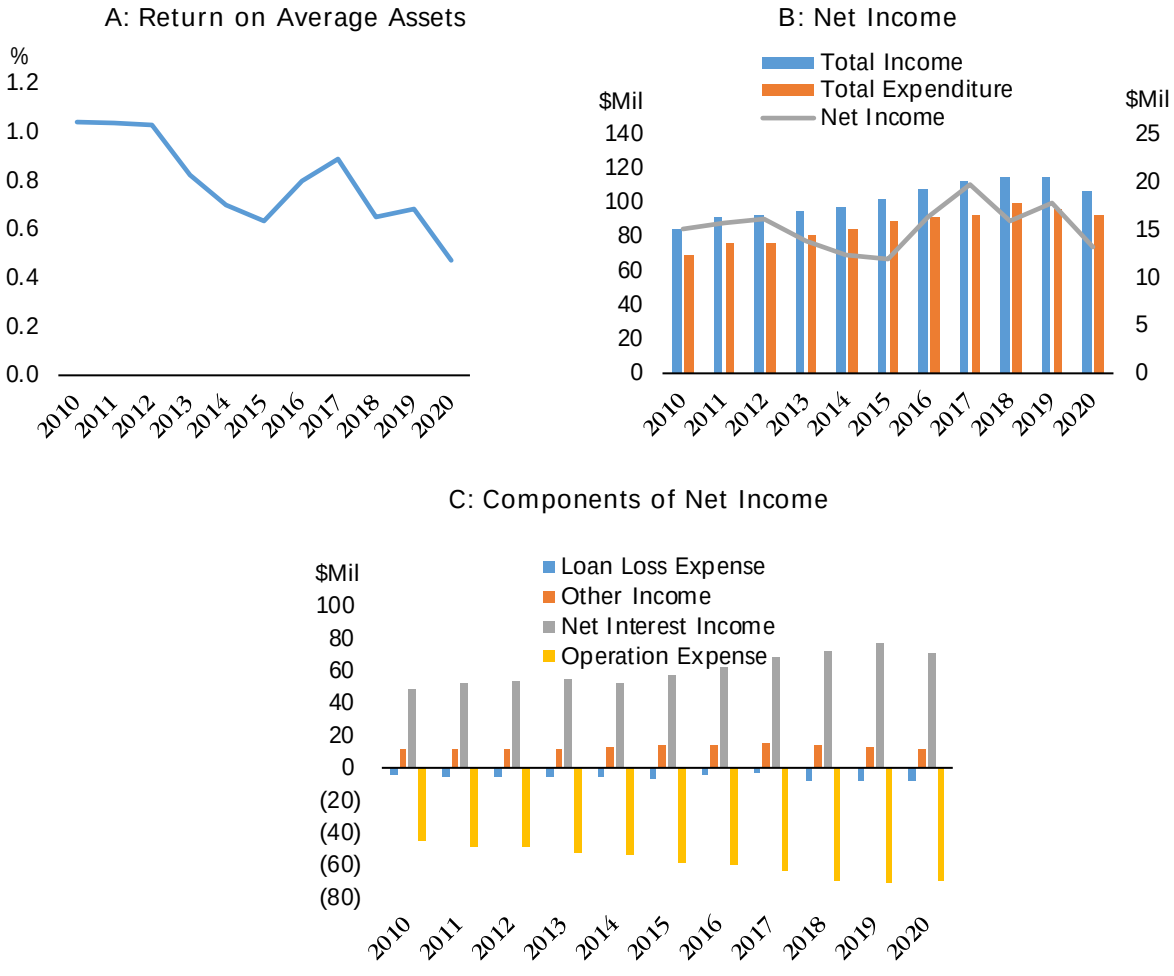
Figure 35: Loan-to-Deposit Ratio



Source: Financial Services Commission

Profitability in the sector fell slightly, with credit unions recording a return on assets of 0.5 percent (Figure 36A). Total income fell by $8.3 million, reflecting the impact of declining income from interest payments related to loans. This decline was expected given the moratoria programmes coupled with the increase in NPLs. Given the reduction in the interest income of 7 percent, the net income fell by 25.8 percent when compared to December 2019 (Figure 36B). Even though there was a reduction of interest and operating expenses, it was not enough to compensate for the reduced interest income (Figure 36C).

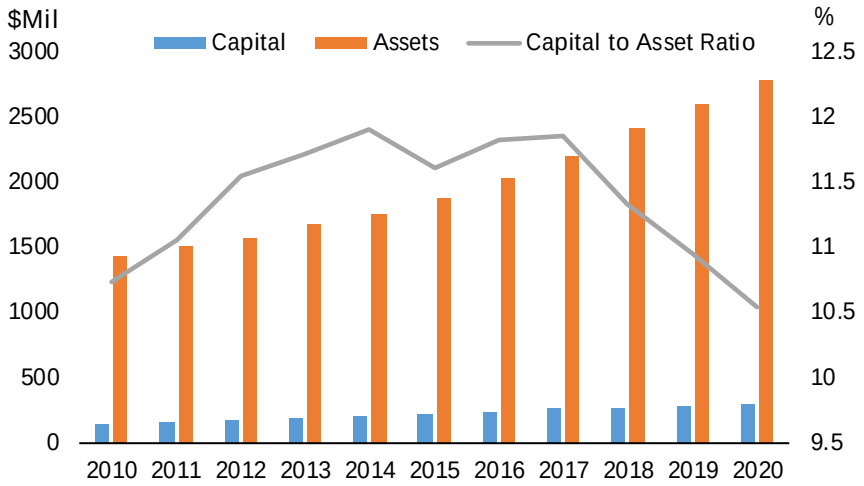
Figure 36: Profitability



Source: Financial Services Commission

The credit union sector's capital rose by 3.3 percent as the provisioning requirements associated with IFRS 9 as well as impacts associated with COVID-19 slowed the pace of capital accumulation. However, the capital-to-assets ratio fell by 0.5 percentage points to reach 10.5 percent due to the continued expansion in the asset base (Figure 37).

Figure 37: Capital-to-Assets Ratio



Source: Financial Services Commission

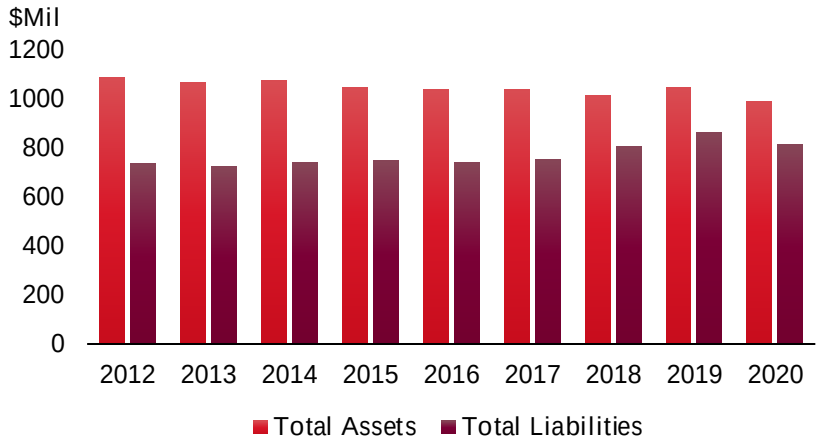
4.4 Insurance Companies

General Insurance Sector

At the close of the year 2020, total assets were estimated to be $987.8 million, a 5.6 percent decline when compared to the prior year (Figure 38). The decline in assets was mainly reflected in cash and deposit holdings, which fell by $23.1 million (Figure 39).

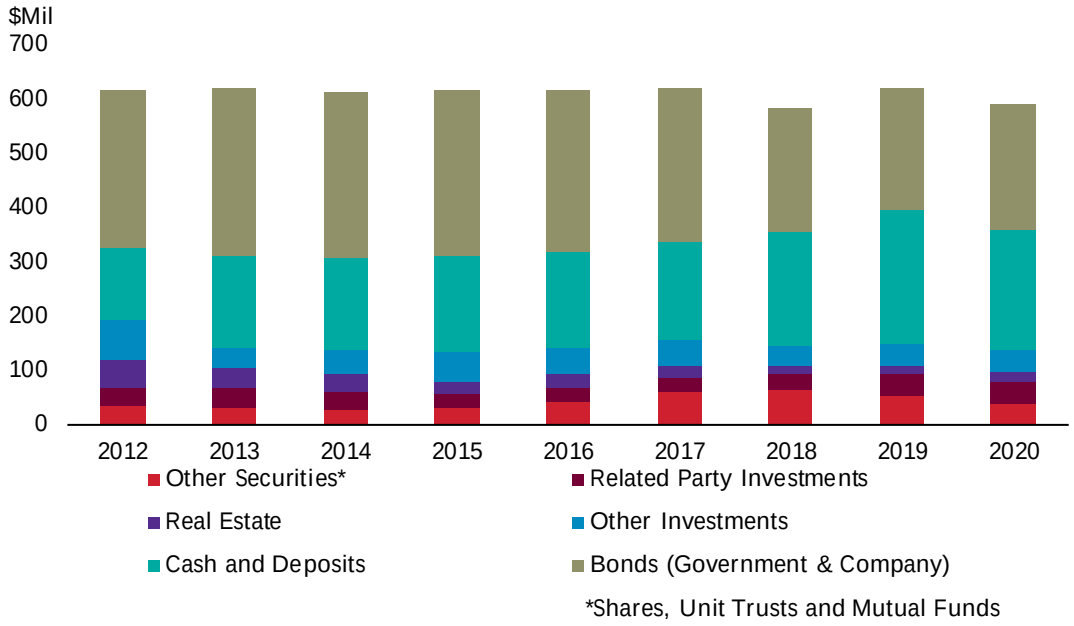
Similarly, total liabilities for the group also fell by 5.8 percent to reach $813.9 million. This is the result of reductions in provisions set aside for claims and decreases in other liabilities such as treaty accounts and premium taxes.

Figure 38: Total Assets vs Total Liabilities



Source: Financial Services Commission

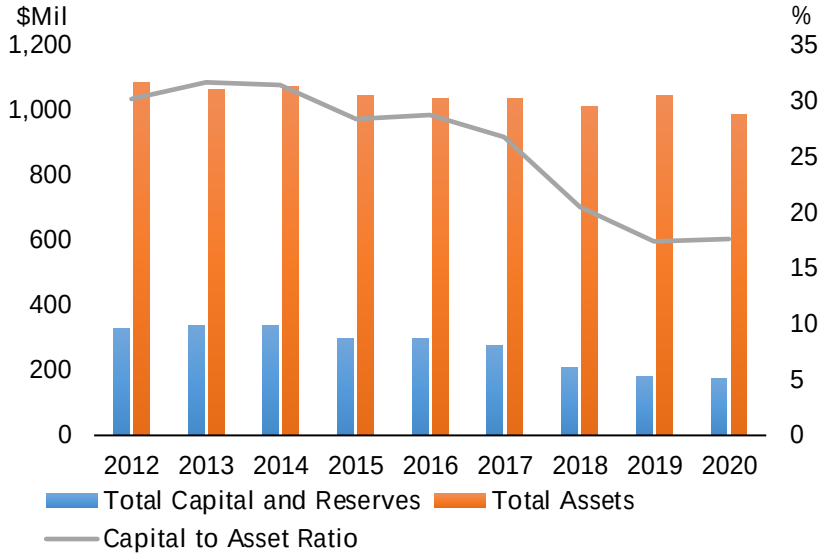
Figure 39: Classes of Investments



Source: Financial Services Commission

The capital-to-assets ratio as at December 2020 stood at 17.6 percent (Figure 40). This represents 0.2 of a percentage point increase over the last period. The actual solvency margin for the group, was twice the amount of the required 25 percent margin and all insurers remained solvent during the period.

Figure 40: Capital-to-Assets Ratio

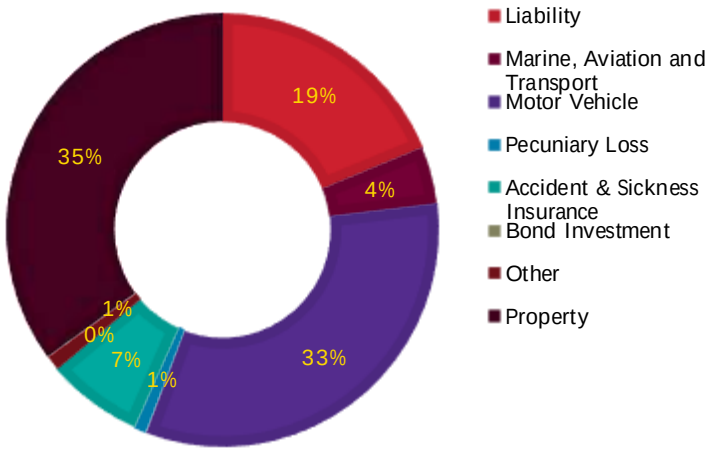


Source: Financial Services Commission

The level of gross premiums recorded by the industry fell by approximately 1.7 percent to reach $488.0 million, as lines of business such as motor and property and other,

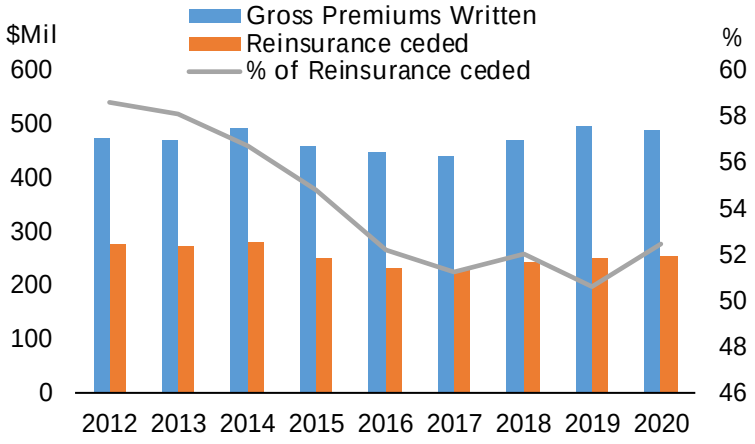
recorded marginal declines in the number of policies in force. Property insurance continued to be the largest line of business, accounting for 35 percent, followed by motor, which accounted for 33 percent (Figure 41). These percentages are consistent with those recorded over the last two years. The level of insurance ceded remained in excess of 50 percent (Figure 42). Property continues to be the line of business for which reinsurance is mostly ceded. Motor insurance requires less ceding to reinsurers as this line of business is supported by the statutory fund.

Figure 41: Gross Premiums Written 2020



Source: Financial Services Commission

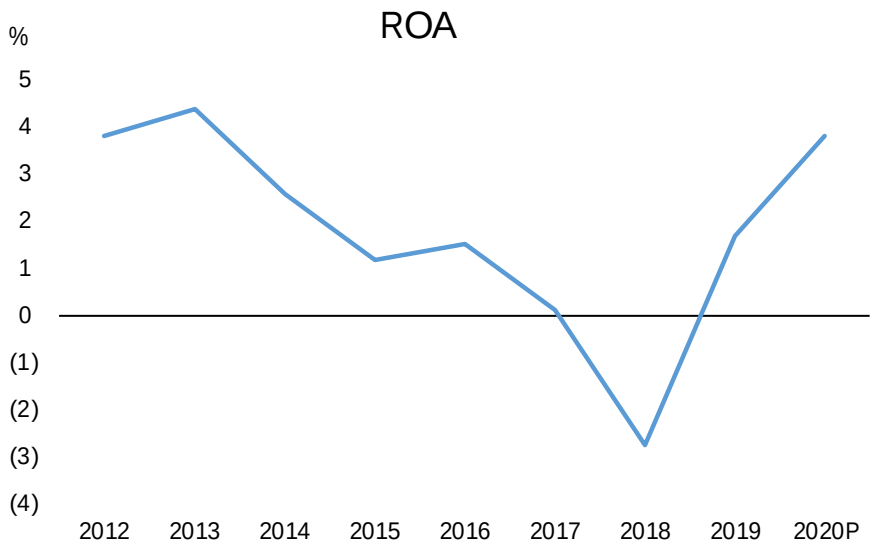
Figure 42 Gross Premiums Written vs Reinsurance Ceded for the General Insurance Sector



Source: Financial Services Commission

Subsequent to the 2018 domestic debt restructuring programme, profitability of the sector showed signs of improvement as the return on assets stood at 3.8 percent, 2.1 percentage points higher than in 2019 (Figure 43). The net income position improved as the industry recorded lower underwriting expenses. This fall in expenses stemed from lower-than-usual claims from lines of business such as motor, following the first COVID-19 lockdown. As at the end of Deccember 2020, prelimary estimates indicate an approximate 6 percent falloff in the level of claims for the motor vehicle line of business

Figure 43: Profitability of the General Insurance Sector



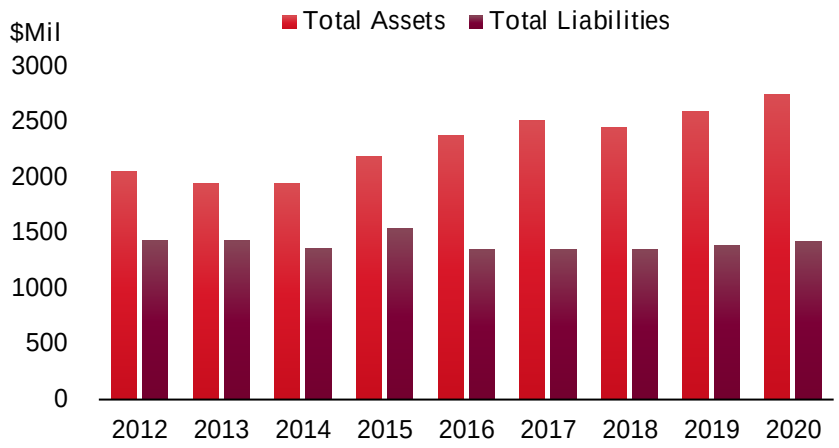
Source: Financial Services Commission

Life Insurance Sector

The combined assets at end-2020 for the six companies writing life insurance were $2,749.8 million, representing an increase of 5.7 percent over the comparable period one year earlier (Figure 44). This increase in assets was driven largely by the growth in related party investments which were estimated to be approximately $1,233.5 million, 8 percent higher than recorded at the end of December 2019. Government and company bonds, the second largest component of investments, increased by approximately 8 percent (Figure 45).

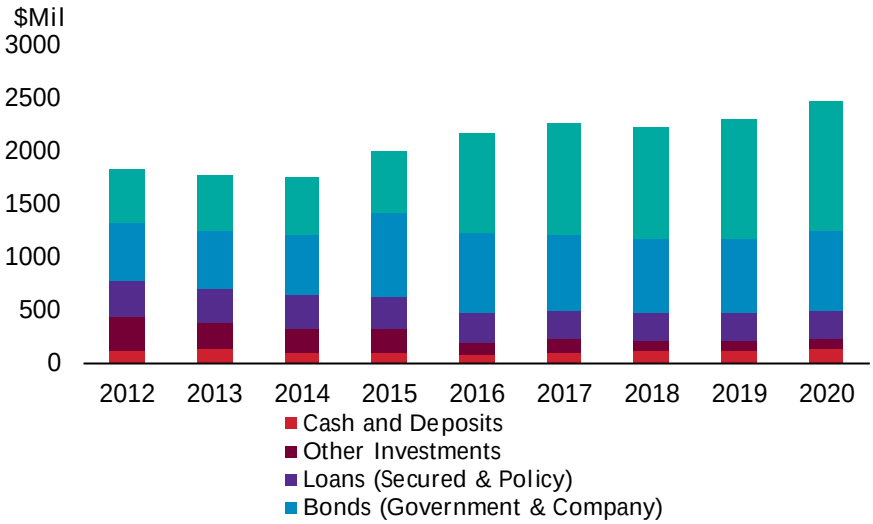
Similarly, total liabilities, which were driven by increases in life insurance and annuity provisions, rose by 2.3 percent to reach approximately $1,424.0 million.

Figure 44: Total Assets vs Total Liabilities



Source: Financial Service Commission

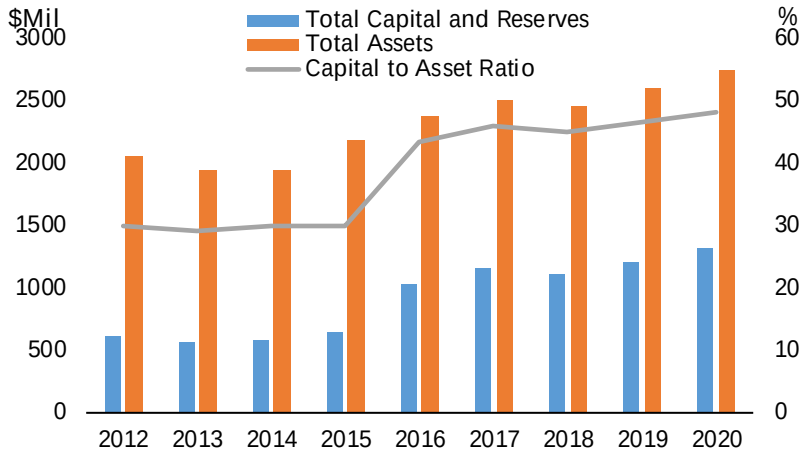
Figure 45: Classes of Investments



Source; Financial Services Commission

At the end of 2020, capital as a percentage of assets was an estimated 48.2 percent, 1.7 percentage points higher than end-2019 (Figure 46). All entities exceeded the required solvency margin and the assets base exceeded liabilities by approximately 93 percent.

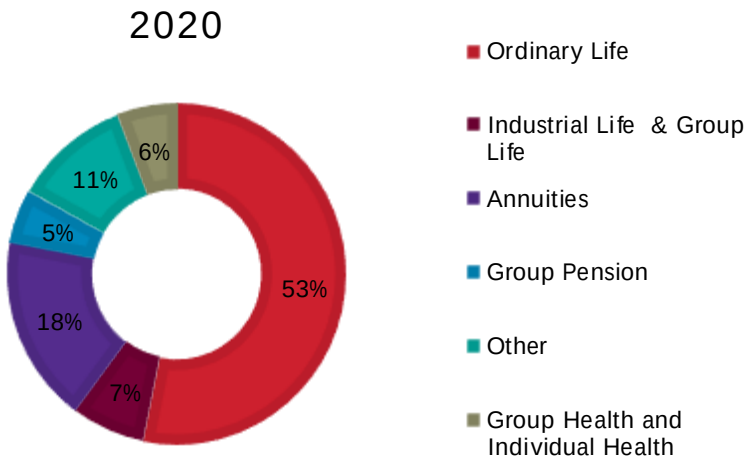
Figure 46: Capital-to-Asset Ratio



Source: Financial Services Commission

Gross premiums written fell by 3.7 percent as all lines of business with the exception of industrial life and group life, reported lower premiums than the prior year. The ordinary life line of business continued to account for over half of the premiums generated by the life sector in 2020 (Figure 47). The 53 percent recorded reflected an increase of 3 percentage points when compared to 2019.

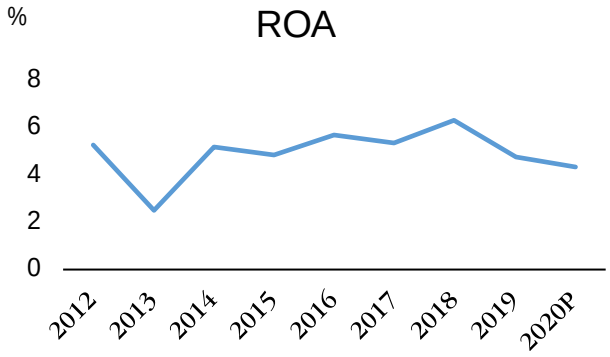
Figure 47: Distribution of Life Insurance Premiums



Source: Financial Services Commission

Profitability for the sector dipped slightly in 2020, falling by 0.5 percentage points to reach 4.3 percent (Figure 48). The sector experienced a fall in total expenses of $60.4 million, but, this was overshadowed by the $65.8 million decline in revenue recorded during the period as a result of lower returns from related party investments.

Figure: 48: Return on Assets for Life Insurers



Source: Financial Services Commission

4.5 Mutual Funds

As at December 2020, the domestic mutual fund sector comprised 16 mutual funds, with net assets under management of $2,457.3 million (Figure 49). Net assets under management grew by 1.9% when compared to the prior year. This increase was reflected mainly in investments in mutual funds and fixed income securities (Figure 50). Growth funds continued to dominate, accounting for 49.2 percent of the mutual fund market (Figure 51).

Figure 49: Net Assets Under Management

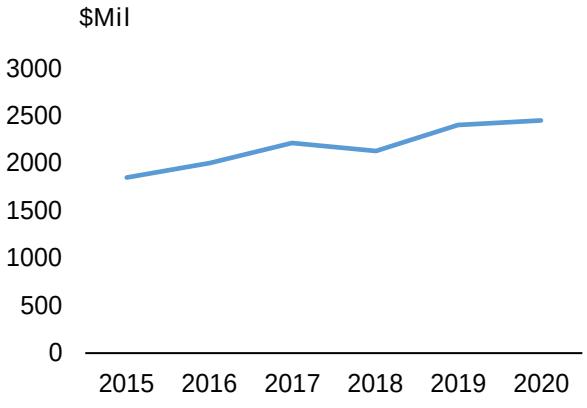
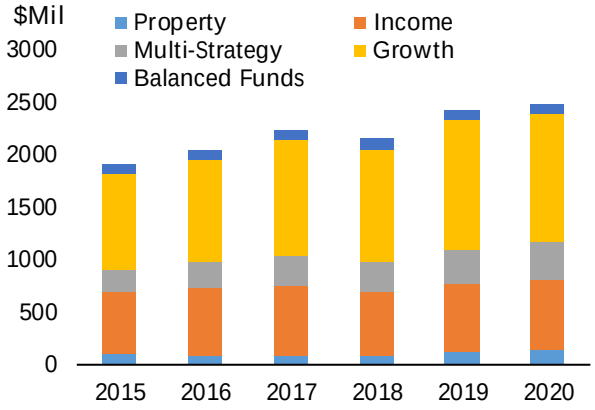
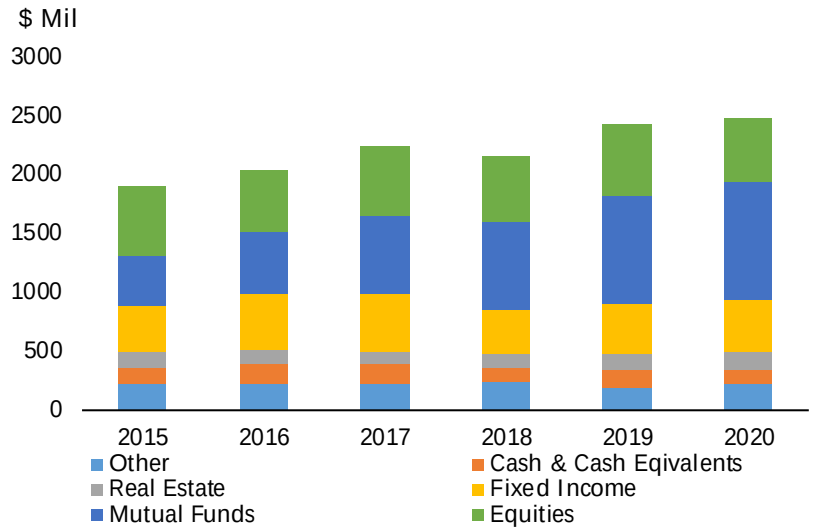


Figure 50: Net Assets by Fund Type



Source: Financial Services Commission

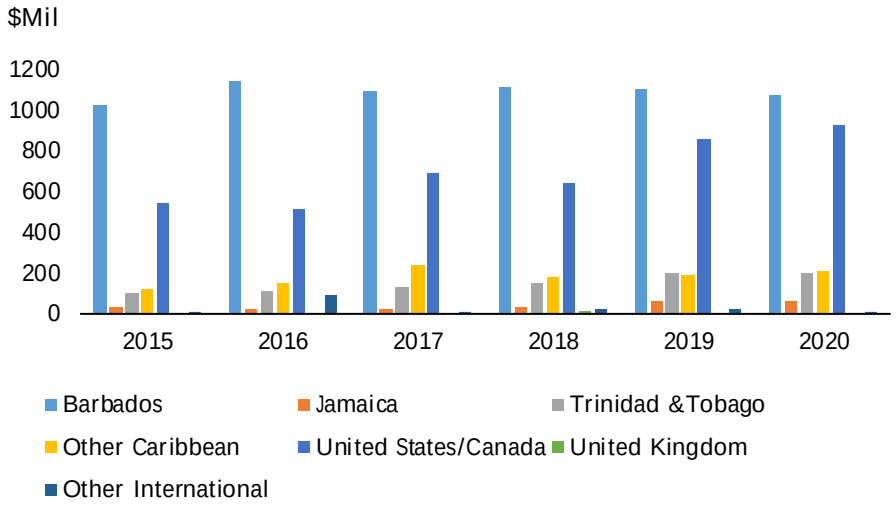
Figure 51: Asset Allocation of Mutual Funds



Source: Financial Services Commission

Barbados remains the jurisdiction for which local mutual funds have the greatest exposure. Barbados accounted for 42.4 percent of the total exposure, followed by United States and Canada, which comprised an aggregate 36.8 percent as at December 2020 (Figure 52).

Figure 52: Jurisdictional Exposure

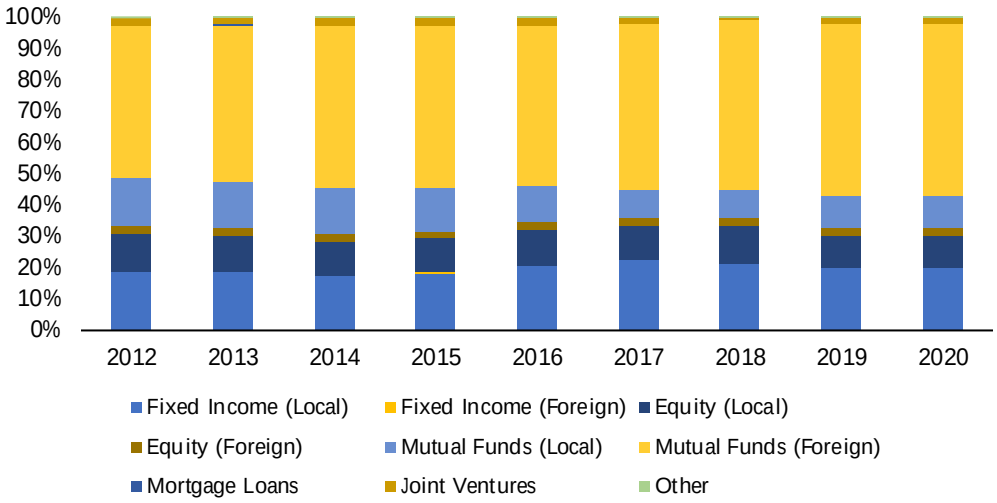


Source: Financial Services Commission

4.6 Occupational Pension Plans

The performance of the occupational pensions sector was modestly impacted by the COVID-19 pandemic. However, these institutional investors continue to operate in a climate with limited investment opportunities. Preliminary estimates indicate that fund assets under management were $2,404.4 million, a contraction of 0.1 percent, in contrast to the 3.5 percent growth experienced in 2019.

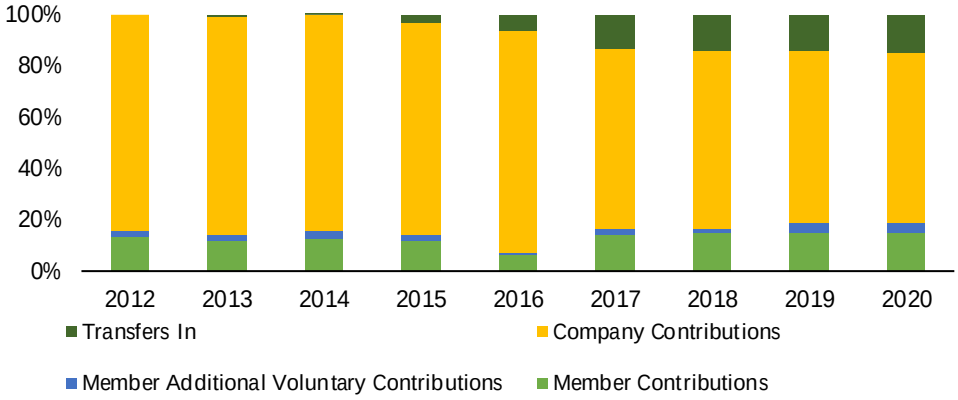
Figure 53: Distribution of Pension Plans Investment Portfolio



Source: Financial Services Commission

Within the investment portfolio, all financial assets held increased by a mere 0.1 percent, with the exception of domestic mutual funds which fell by 1.2 percent. Foreign mutual funds continued to dominate the portfolio accounting for 55 percent of total investments. The second-largest component was local fixed-income securities, which comprised almost 20 percent of the entire portfolio (Figure 53).

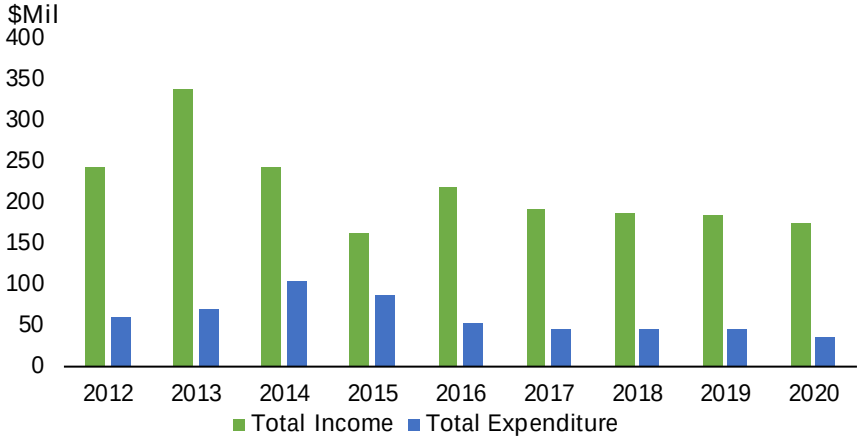
Figure 54: Relative Share of Pension Plan Contributions



Source: Financial Services Commission

The pensions sector recorded a decline in total contributions of approximately 1.6 percent. Company contributions amounted to $59.9 million – 67 percent of total contributions – whereas member contributions were $13.7 million (15.2 percent). Contributions 'transferred in' accounted for 14.7 percent of the total, reaching $13.2 million at year-end (Figure 54).

Figure 55: Pension Sector Income and Expenditure



Source: Financial Services Commission

The earnings of the sector decreased by 5.1 percent to an estimated $174.5 million at the end of the review period. Expenditure was approximately $35.3 million, a gain of 4.5 percent over the previous year. This expenditure primarily consisted of increased pension payments of about $1.5 million (Figure 55).

5. Stress Testing

5.1 Deposit-taking Institutions

Given the reduced level of economic activity, deposit-taking financial institutions continue to work with customers to ease their debt burden by way of offering moratoria on loan repayments and restructuring of the outstanding debt in some cases. The full impact of the pandemic may still be ahead of the local financial services sector. This highlights the greater need for testing the resilience of deposit-taking institutions.

In this section, the potential response of the financial system to macroeconomic and other adverse shocks is explored. Where appropriate, 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[5]. The impact of the shocks is 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[6]

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 portfolio and 65 percent of total NPLs.

Given the multiple surges and attendant variants that are becoming more common with the pandemic, there is the possibility that the forecasted recovery may be delayed. Therefore, the stress testing of credit risk has become even more imperative.

Provisioning Shocks

As at March 2021, the pre-shock provisions-to-NPL ratio stood at 54.3 percent for the combined banks and deposit-taking finance and trust companies, marginally higher than one year earlier. This means that slightly more than half of the industry's impaired loans are covered by provisions. However, at a subsector level, the distribution of provisions is uneven, with commercial banks' provisions representing 59.3 percent of their NPLs, whereas the finance and trust subsector had coverage of 27 percent.

The recovery of bad debt that is secured by real estate can sometimes be protracted because it may require a significant period of time before the property is sold. However,

[5] Stress tests on credit, liquidity and interest rate risk for commercial banks and trust and finance companies were guided by the framework of Čihák, M. (2007). Introduction to Applied Stress Testing. IMF Working Paper WP/07/59.
[6] Simulations conducted on March 2021 data.

loans secured by real estate are not required generally to provision at greater than the 10 percent required provisioning rate of the substandard category, except for the unsecured portion of the loan. For the first stress test, we applied 100 percent provisioning to all mortgage-backed NPLs. However, the capital adequacy of these institutions would provide adequate buffers for the additional provisions required, with the combined CAR for the eight banks and finance and trust companies falling by 1.5 percentage points.

Our second provision shock, again assumes no increase in existing NPLs, but raises provisioning on the existing stock of NPLs to 100 percent. The stress tests indicated that the aggregate post-shock CAR declined from 15.9 to 14 percent for the banks and from 19.1 to 11 percent for the deposit-taking trust and finance companies. The more rapid erosion in the finance and trust companies' CAR 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 one finance and trust company was severely impacted.

For the credit union sector, the pre-shock rate for provisioning was 23.4 percent and the capital adequacy ratio for the industry was 10.5 percent. The seven largest entities in the sector accounted for more than 93 percent of total assets and three of these entities were below the regulatory benchmark of 10 percent before any shocks were applied.

Assuming no change in current NPLs and a 25 percent increase in the level of provisioning, the capital adequacy ratio fell by 42 basis points to reach 10.1 percent where the same three credit unions remained below the regulatory minimum of 10 percent. Given the same assumption of no change in NPLs, but a 50 percent increase in the level of provisioning, the capital adequacy ratio fell to 8.4 percent with four institutions now below the regulatory minimum. Further increasing the level of provisions on existing NPLs to 100 percent reduces the sector's capital-to-asset ratio to 4.4 percent, with five credit unions falling below the 10 percent threshold.

Table 6: CAR Outcomes upon a Proportional Increase in Provisions

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

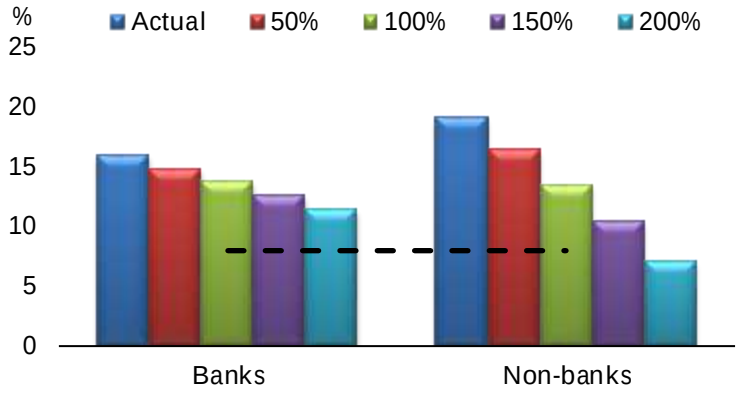
Source: Financial Services Commission

NPL Shocks

In the second stress test of commercial banks and finance and trust companies, NPLs are increased in 50 percentage point increments, with the additional NPLs all carrying provisions of 50 percent.

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 27 percent, the finance and trust subsector could withstand the 150 percent increase in NPLs scenario, but fell below the 8 percent standard when a 200 percent increase is applied (Figure 56). This result is comparable with last year's and reveals no deterioration over the past year.

Figure 56: 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 fell below the 8 percent prudential standard, while two institutions (one bank and one finance and trust company) fail to maintain adequate capital buffers when a 150 percent increase to NPLs is induced. After a 200 percent hike, four institutions (two banks and two finance and trust companies) breach capital requirements, with one finance and trust company becoming insolvent without injection of fresh capital (Table 7).

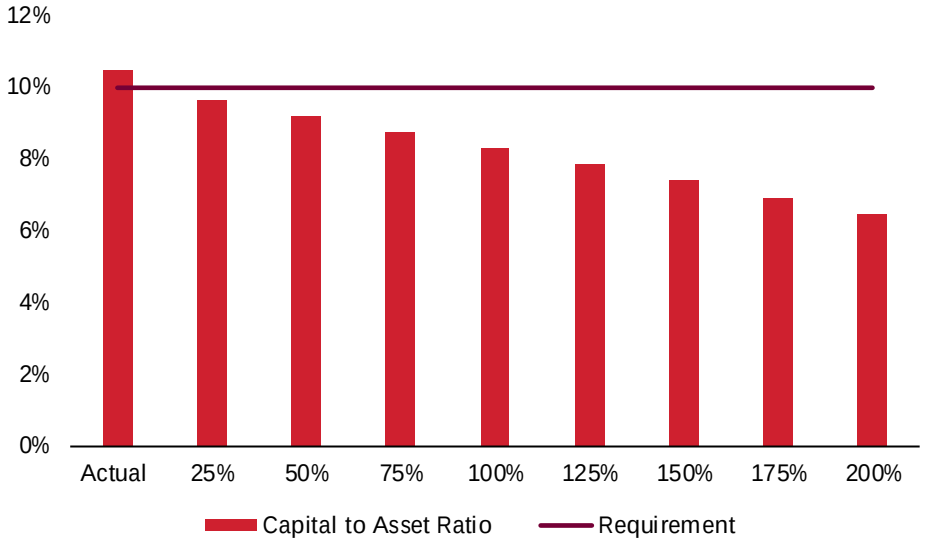
Table 7: CAR Outcomes from Increasing NPLs

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

Source: Central Bank of Barbados

Tests were also conducted to assess the impact of increased NPLs on capital levels of credit unions. Given a pre-existing provisioning level of 23 percent of NPLs, a 25 percent increase in NPLs lowered the capital adequacy ratio to 9.7 percent, with the four entities' capital-to-asset ratios dropping below the required level. As the level of NPLs increased by 50 percent, the capital adequacy ratio fell to 9.3 percent with the same four entities falling below the required minimum. The shocks were further increased in increments of 25 percent, up to 200 percent, with the capital-to-assets ratio falling further below the 10 percent requirement with each increment as shown in Figure 57.

Figure 57: Impact of 25% Step Increases in NPLs on Capital of Credit Unions



Source: Financial Services Commission

Table 8: CAR Outcomes Upon a Proportional Increase in NPLs

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

Source: Financial Services Commission

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 9). However, with 100 percent provisioning, one bank's CAR fell below the 8 percent after round three of the simulation and one more after round four. Still at 100 percent provisioning, three banks and one finance and trust company required more capital after the fifth round. Notably, none of the institutions tested became insolvent even after the total loss of their five largest debtors. This is an improvement over the large-exposure NPL stress tests of the previous year due to a reduction in some of the balances of the largest exposures and stronger capital positions.

Faced with the pandemic, additional tests were conducted between the 50 and 100 percent provisioning levels to determine the breaking point. It was determined that combined commercial banks and finance and trust companies could also withstand defaults from their five largest debtors with provisions as high as 80 percent and remain above the prudential standard of 8 percent.

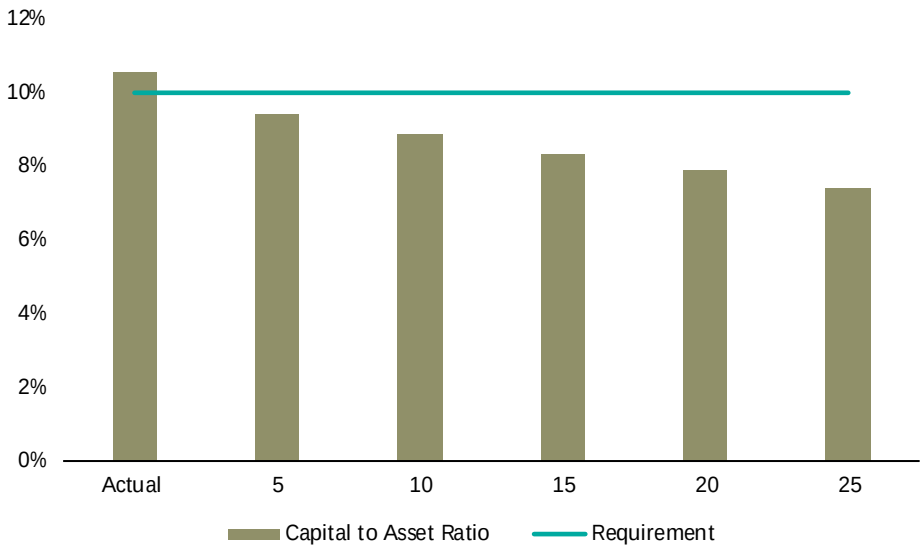
Table 9: CAR Outcomes of Large Exposure Shocks

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	1	0
Round 4	0	0	0	0	2	0
Round 5	0	0	0	0	3	1

Source: Central Bank of Barbados

The large exposure test for the credit union sector was conducted using the top 25 borrowers for each of the seven largest credit unions. With provisioning 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 9.4 percent, where 5 entities were found to be below the regulatory requirement. Considering all 25 borrowers, the post-shock capital adequacy ratio was approximately 7.4 percent with all of the top seven credit unions below the 10 percent threshold (Figure 58).

Figure 58: Impact of Large Exposure Default on Capital in Credit Unions Sector



Source: *Financial Services Commission*

Table 10: CAR Outcomes Upon Default of Large Exposures

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

Source: Financial Services Commission

5.1.2 Liquidity Risk

Given that DTIs' funding model is based primarily on deposits, maintaining adequate liquidity is of major importance. However, prior to and during the pandemic, the financial system has been marked by significant excess liquidity. Commercial banks and finance and trusts companies combined to record a liquid asset (cash equivalents and tradeable securities) to total assets ratio of approximately 26.5 percent at end-March 2021.

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. Although this treatment would not be comparable with prior liquidity

stress tests, it should provide a more conservative perspective of the market in the event of a run on the banks and finance and trust companies.

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 11).

Table 11: 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	2
Day 2	0	1	0	2	0	2
Day 3	0	2	0	2	2	3
Day 4	0	2	2	3	4	3
Day 5	0	2	4	3	5	3

Source: Central Bank of Barbados

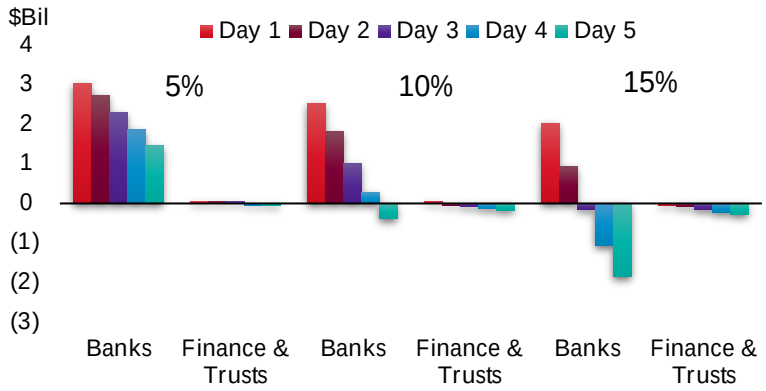
With daily five percent deposit runs, no banks required liquidity support for the five days reviewed, while one finance and trust companies required liquidity support from the second day and two from day three.

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

With daily 15 percent runs, two banks required liquidity support from day three, four banks from day four and all five banks from day five. Additionally, at 15 percent daily runs, two finance and trust companies required support from day one and all three required support from day three. (Figure 59).

The central finding of the revamped liquidity stress test suggests that finance and trust companies would need liquidity support earlier than in prior tests because a larger share of their deposits would be vulnerable to deposit runs.

Figure 59: Results of Deposit Runs (Net Cash Flow) March 2021



Source: Central Bank of Barbados

As it relates to credit unions, this test was used 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 was 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 five where one entity required liquidity support. With 10 percent runs, one entity had liquidity challenges on day three and this increased to three entities on day four and four entities after day five. At the 15 percent run rate daily, two credit unions needed liquidity support after day two and by the third day, four (4) entities were found to be experiencing liquidity challenges. Considering the previous period, test results suggest that some cooperatives may have undertaken measures to improve their liquidity stance to better handle the demands of their members. Last year, at the 15 percent run scenario, the seven largest credit unions needed liquidity support at the end of day 5. This year's results however revealed that only four entities required additional liquidity.

Table 12: Credit Unions Requiring Liquidity Support upon Runs on Members' Savings

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

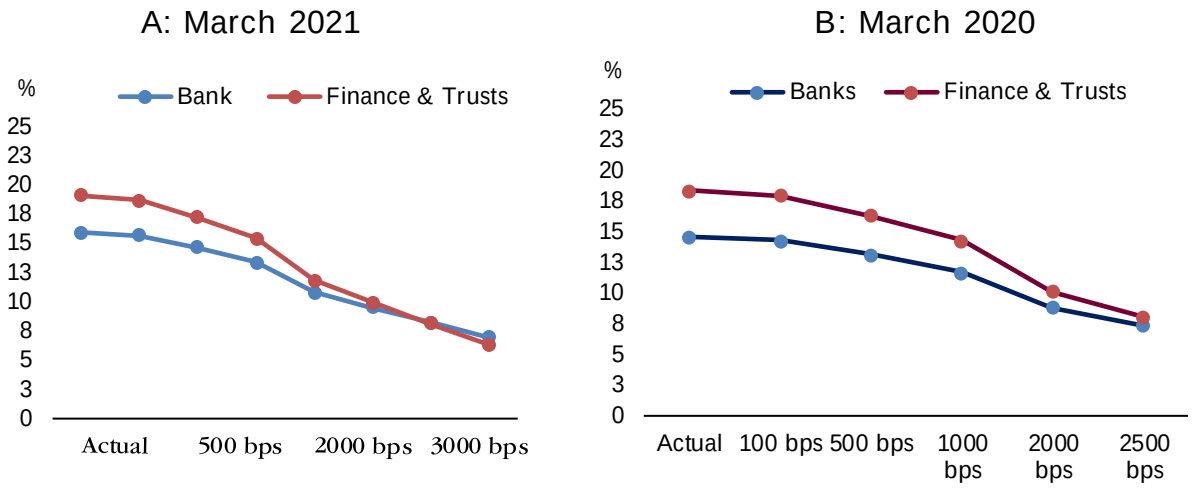
Source: Financial Services Commission

5.1.3 Interest Rate Risk

The short-term maturity gap[7] was used to examine the impact of rising deposit 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 that at the aggregate level, the higher CAR at March 2021 compared to March 2020, 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 2020 they could withstand a deposit rate increase of up to 20 percentage points before the regulatory capital levels were breached (Figure 60), at March 2021, they could withstand an increase of approximately 30 percent. At an institutional level, only under a severe assumption of an increase of 1000 basis points (10 percentage points), would one bank fail to maintain adequate capital levels, while after 2000 basis points (20 percentage points), the capital of three banks and one finance company would become impaired (Table 13).

Figure 60: Interest Rate Impact on CAR



Source: Central Bank of Barbados

[7] 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.

Table 13: CAR Outcomes of Interest Rate Shock

	CAR < 8%	
Scenario	No. of Banks	No. of Finance & Trust
100 bps	0	0
500 bps	0	0
1000 bps	1	0
2000 bps	3	1
2500 bps	3	2
3000 bps	3	2
3500bps	3	2

Source: Financial Services Commission

5.2 Insurance

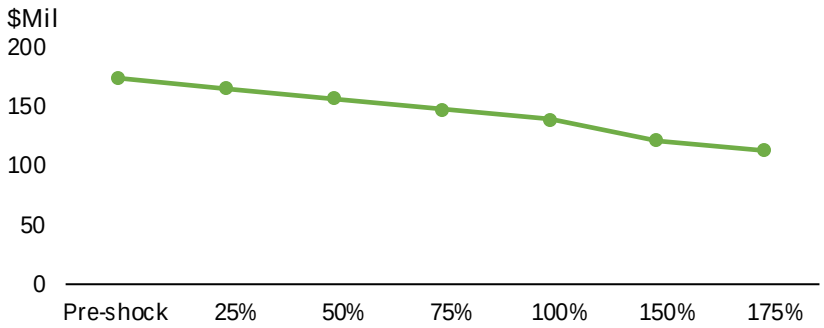
5.2.1 Underwriting Risks

This test was conducted to assess the resilience of the sector following the possibility of increased claims on all lines of business. Assuming that the claims in all lines increased simultaneously by various percentages, insurers' solvency position and their impacts on capital are examined.

General Insurance

Under the baseline scenario for the general insurance industry, all insurers were solvent. If claims are increased by 25 percent, the industry's capital-to-asset ratio fell from 17.6 percent at baseline to 17.1 percent post-shock where one entity was deemed insolvent. The number of insolvent general insurers rises to two as claims rise by 75 percent and to three at the 100 percent level. However, as the level of claims continued to increase, the capital position of the industry declined less rapidly (Figure 61).

Figure 61: 25% - 175% Increase in General Insurance Claims on Capital Levels



Source: Financial Services Commission

Table 14: Number of Insolvent General Insurers after Underwriting Shock

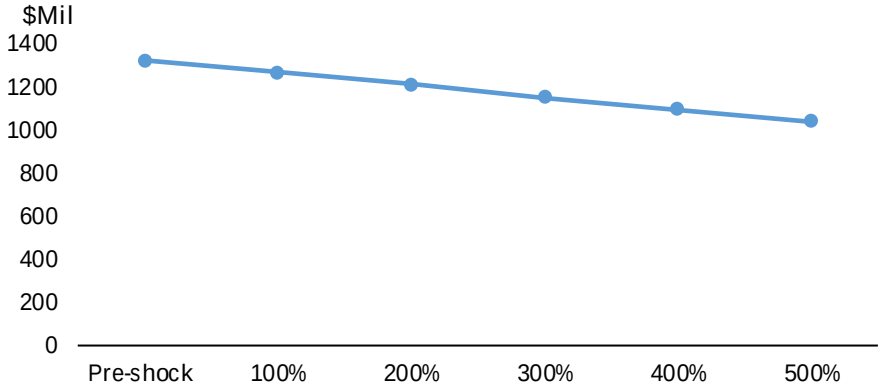
Percentage Increase in Claims	No. Insolvent Entities
Pre-Shock	0
25%	1
50%	1
75%	2
100%	3
150%	3
175%	3

Source: Financial Services Commission

Life Insurance

For life insurers, the test considered the eventuality of increased claims in both health and life insurance business at intervals of 100 percent. Here, results show the same trend as capital levels are slowly declining. Despite the decline in capital the solvency positions of all life insurers were in good standing with capital to cover 10 times the amount required (Figure 62).

Figure 62: Outcomes of a 100% - 500% Increase in Life Insurance Claims on Capital Levels



Source: Financial Services Commission

5.2.2 Economic Downturn

This shock takes into consideration plausible economic changes such as a downward shift in the yield curve of 300 basis points, a 25 percent decline in real estate values and mortgages and a 30 percent fall in the price of equity instruments.

General Insurance

After applying this shock, the results of this test show that profitability among general insurers deteriorated and the capital to asset ratio fell from 17.6 percent to reach a post-shock percentage of about 15.3 percent. Six entities recorded net losses but all entities were still able to retain the required 25 percent solvency margin and remained solvent. The source of the weaker profitability was the increased value of policyholder benefits that contributed to the negative underwriting position of the industry and lower investment income.

Life Insurance

Overall, post-shock result indicated that the life industry experienced a net loss of $240 million which reflects the negative income positions of most entities. Only one entity was found to be profitable after the shock, however no entities were said to be insolvent. The level of capital post shock was an estimated $959.9 million. Post-shock, the level capital to asset ratio fell to 35.0 percent.

Table 14: Economic Downturn Results

	General Insurance		Life Insurance	
	Pre-Shock	*Post Shock*	*Pre-Shock*	*Post Shock*
Capital-to-Assets Ratio	17.6	15.3	48.2	35.0
No. Insolvent Entities	0	0	0	0

Source: Financial Services Commission

5.2.3 Multiple Shocks: Pandemic, Economic Downturn and Hurricane

This extreme scenario encompasses many vulnerabilities to the insurance sector. The scenarios employed reflect those assessed in the economic downturn scenario as well as an increase in claims which may be recognisable in cases of a pandemic or hurricane. For this shock, it is assumed that property claims will increase by 150 percent while claims for all other relevant lines of business will rise by 100 percent. In addition, the expenses of insurers and defaults by related parties are also stressed.

General Insurance

For the general insurance sector, capital levels were impacted as the capital adequacy ratio fell to 7.1 percent. Profitability for the general insurance industry was severely impacted as a result of a 38 percent expansion in underwriting expenses. Under this extreme scenario, three insurers were below the 25 percent benchmark for solvency.

Life Insurance

Applying this shock to entities writing long-term business, five companies made losses causing the overall industry capital to fall to 23.4 percent. However, all entities remained solvent.

Table 15: Multiple Shock Results

	General Insurance		Life Insurance	
	Pre-Shock	*Post Shock*	*Pre-Shock*	*Post Shock*
Capital-to-Assets Ratio	17.6	7.1	48.2	23.4
No. Insolvent Entities	0	3	0	0

Source: Financial Services Commission

6. Research Note

6.1 Cyber Risk and the Financial Sector: A Review of the Evidence

Anton Belgrave[1] and Simone Forrester

Introduction

A stable financial system has the ability to facilitate and enhance economic processes, while simultaneously managing risks and absorbing shocks. The impairment of any of the core functions of the financial system – facilitation of payments and settlements, the allocation of credit, risk transfer, liquidity provision, maturity transformation or price discovery - can cause financial instability.

Over the past decade, cyber risk has emerged as an increasing threat to financial stability as cyber-attacks against financial and non-financial institutions have become more frequent. This note explores cyber risk and financial institutions by focusing on the growing scale and frequency of cyber-attacks, their potential impact on financial stability, and the responses of regulatory agencies, industry bodies and governments to address this issue.

The Growing Threat of Cyberattacks

The Geneva Association (2016), an international insurance think-tank whose members include large insurance and reinsurance companies, has suggested that cyber risk embodies "any risk emerging from the use of information and communications technology that compromises the confidentiality, availability, or integrity of data or services." Among the possible damages are data and software loss, business interruption, financial theft and fraud, extortion, intellectual property theft, legal liability and even possible physical damage.

Data from the Carnegie Endowment for International Peace (2021) indicated that the most popular types of attack on private financial institutions[2], were malware attacks. In these incidents, harmful code is introduced in the target network usually with the purpose of theft. Closely following are ransomware attacks, which generally involve the locking of the victim's files until a ransom is paid. Ransomware as a service has also emerged as a feature of the threat landscape, lowering the technical barrier to its adoption (Carter 2017). Skimmer attacks, which involve the physical modification of ATM slots in order to access customer funds, also remain a source of activity for cyber criminals. In addition, the pandemic and the boom in "work from home" activities and online transactions, have

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led to a renewal of interest in banking malware for mobile devices and mobile device emulators. Similarly, with the focus on remote work and access to financial institutions, "phishing" attacks have escalated. In these phishing attacks, a malicious actor sends emails that appear to come from trusted, legitimate sources, in order to acquire sensitive information from the target. Data breaches remain a substantial part of the threat landscape as well as the ever-present threat from insiders. Financial entities are also frequent targets of disruption-type attacks such as distributed denial of service (DDoS) attacks, which generally curtail or eliminate their business actives over some period of time. The span of these attacks is global and affects all aspects of the financial system from payments processors, fintech firms, and mobile money vendors to traditional financial institutions.

Table 1: 2020 Cyberattacks on Private Financial Institutions Globally by Type

Nature of Attack	Type of Attacks				
	DDoS	Malware	Ransomware	Phishing	Other[#]
Data Breach	0	0	2	1	10
Disruption	5	0	0	0	0
Multiple	0	0	0	0	1
Theft	0	9	4	0	9

Source: Authors' calculation from data provided by the Carnegie Endowment for International Peace (2021).
[#]This category combines insider threat, sim-card fraud, skimming and other unspecified threats.

Based on the adverse impact these events can have on the foundations of the financial system - namely the confidentiality, availability and integrity of data - attacks on financial institutions are an increasing source of concern for financial instability. Depending on their scale and persistence, these events have the potential to disrupt the core functions of the financial system, leading to possible liquidity runs and/or solvency issues.

The increasing frequency, creativity and severity in cybersecurity attacks has attracted significant interest from governments and regulatory bodies. In March 2017, the G20 Finance Ministers and Central Bank Governors warned that "the malicious use of information and communications technology could disrupt financial services crucial to both national and international financial systems, undermine security and confidence, and endanger financial stability" (G20 Research Group 2017). However, industry concerns preceded this warning, with global risk management surveys ranking cyber risk as second only to regulatory risk in the types of risk financial institutions believe would increase in importance (Freidman 2016). Central banks themselves have been frequent targets of cyber-attacks (Appendix table 1).

Losses related to cyberattacks can be considered as falling under broad operational risk events. However, they have characteristics that can differ from traditional sources because of the numerous entry points, the persistence of sophisticated attacks, the capacity of the attackers to subvert backup processes, and the attackers use of stealth to propagate

rapidly within a network of systems (Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions 2016). In addition, cyber-risk cannot be easily modelled, measured or hedged based on past performance given the constantly evolving nature of cyber-attacks and the lack of empirical data, unlike financial risks such as credit or market risk.

The Office of Finance Research (2017) of the US Department of the Treasury identified three channels through which risk can lead to potential systemic crises. These are:

i. the lack of financial substitutability which might arise with the impairment of key hubs such as electronic trading systems, clearing houses and exchanges;
ii. the loss of confidence whereby a wide-ranging incident can cause a loss of confidence that in turn generates a run on financial institutions; and
iii. data integrity where attacks that destroy the integrity of data take longer than expected to be restored, yielding loss of confidence particularly in markets that process orders rapidly.

To this list, Healey et al. (2018) added the lack of information and communications technology (ICT) substitutability, as a growing percentage of the world's computing and storage falls on a few cloud service providers. Local disasters often reveal unexpected physical dependencies by disrupting entire regions or industries. As cloud providers become more systemically important, cloud dependence is likely to increase tail risk.

Cyber events already cause significant damage, with the attempted US $1 billion theft from the Bank of Bangladesh in 2016 being perhaps the most audacious. However, less dramatic but frequent incidents also highlight the risk of cyber-attacks to the financial system. Aldasoro et al. (2020) analyse a detailed cross-country database on operational risk events in the financial sector and compute a cyber value-at-risk (VaR). They find that cyber events are still rare but they are increasing relative to other operational risk events at banks, and they can contribute up to a third of banks' total operational VaR.

High-value payment and settlement systems may be natural candidates for a malicious attacker intent on inflicting the largest possible damage to the financial system and larger economy. Eisenbach et al. (2021), in simulating a cyberattack involving the five most active US banks, have found that it would result in significant spill-overs to other banks. These effects would likely be amplified if banks respond to uncertainty by hoarding liquidity, a likely scenario that is individually prudent, but systemically harmful.

Similarly, in a qualitative scenario analysis, Boer and Vaquez (2017) note that attacks that can generate systemic events are those which could simultaneous impair both wholesale and retail payments systems so that neither can provide their service over a 24-hour period. These include:

i. major data corruption at a custodian bank at one of the large central security depositories;
ii. direct attacks on the wider infrastructure such as the electricity grid; and
iii. the loss of trust by retail customers because of a few significant or very frequent successful small cyber-attacks.

These effects are especially acute for smaller financial entities given that the recurring investments needed to maintain a high level of cybersecurity may be more easily available to large banks. Gogolin et al. (2021) have noted that half of the cyber-attacks have targeted US banks with assets below $1 billion. They concluded that successful cyber-attacks decrease bank deposit growth rates at small US banks due to bank-specific reputational damages that erode the trust of bank customers and result in a "flight-to-reputation" within local markets. This essentially leads to a relocation of deposits to large banks. While the argument exists, that smaller financial entities would be better positioned by migrating security to cloud-based vendors who have the resources and expertise to address cyber risk, the concern is that this action creates vulnerabilities with respect to concentration risk and potential vendor failure during an incident response.

Global and Domestic Policy Reponses

Globally, these attacks have led to new industry formations and enhanced government oversight. In the US, eight of the institutions identified as having "critical infrastructures" under a US executive order have created the Financial Systemic Analysis and Resilience Center. This entity will securely store and rapidly reconstitute account information if an institution appears unable to recover from a cyber-attack in a timely fashion. The entities, in conjunction with the US Treasury and other bodies, also conduct yearly tabletop exercises that simulate a cyber-attack against payment processes in order to improve public and private sector policies and coordination (Healey et al. 2018).

Information sharing and incident reporting are also key elements to combating cyber threats. Exchanging cyber information and intelligence enables counterparts to leverage their collective knowledge, experience and capabilities to make informed decisions regarding their defensive capabilities, threat detection techniques and mitigation strategies. Incident reporting by firms can provide regulators with timely and critical information on the threat landscape and the resilience of financial institutions. However, increased domestic and international information sharing and reporting must be underpinned by trust in order to be effective. Strengthening trust between counterparts will support cyber resilience for the entire financial system as it continues to become increasingly interconnected.

At the international level, the Financial Services Information Sharing and Analysis Center (FS-ISAC) launched CERES (Central Banks, Regulators and Supervisory Entities) in June

2018. The mission of the CERES Forum is to provide a trusted means for central banks, regulators and supervisors to:

1) Share best practices related to regulatory and compliance controls
2) Gather useful feedback from industry about which controls are most effective
3) Distribute rapidly, information on cyber threats, vulnerabilities, incidents and other threat intelligence that could impact financial services, including attacks that target central banks, regulators and supervisors.

Members of the Euro Cyber Resilience Board for Pan-European Financial Infrastructures (ECRB), established the Cyber Information and Intelligence Sharing Initiative (CIISI-EU). They also defined and agreed upon a high-level framework called the Cyber Information & Intelligence Sharing Initiative: Terms of Reference, which defined the format for establishing and participating in CIISI-EU; the core objectives for information sharing; and the terms to enable the safe and effective information and intelligence sharing within the CIISI-EU.

In the Caribbean, among regional regulators, the Caribbean Group of Supervisory Cooperation and Information Sharing was launched in 1983, to inter alia, enhance and harmonise bank supervisory practices and bring them in line with international standards. As an extension of this group, technical working groups (TWGs) were formed and focused, among other things, on the establishment and the implementation of regional frameworks and the exploration of best practices tailored for the region. A TWG on Cyber Risk was therefore established to facilitate collaboration with regional bank regulators in this area.

Additionally, central banks in the Caribbean established the Cybersecurity Information Sharing Group (CISG) in November 2016. Types of information shared by information security officers (ISOs) include cyber incidents, threats, mitigation methods as well as best practices. Information shared between the regional central banks has allowed them to be more proactive with timely updates of defences.

Essentially, the formal establishment of information sharing and reporting within a trusted community, is pertinent to the strengthening and enhancement of cyber resilience across the global financial system. Notwithstanding that there are many different platforms which can be used to facilitate these fundamental elements of cybersecurity, entities that use the information and intelligence, impede the threat and subsequently raise the level of protection. Moreover, by impeding the potential contagion of such threats, the community acts in the public interest by promoting the safe and sound operation of the entire financial system.

In Santucci (2018), Fox notes a wide proliferation of frameworks and methodologies that attempt to address cyber risk ranging from the US federally sponsored NIST Cybersecurity

Framework, to the qualitative based Information Risk Assessment Methodology 2 (IRAM-2), to the quantitative based Factor Analysis of Information Risk (FAIR). While numerous frameworks exist, no consensus has emerged around a particular cyber-risk management standard, framework of methodology. Given the range of advantages and disadvantages to the various approaches, one suggestion is that the institutions focus less on what is best, and instead select the framework that is most implementable given the institution's current operational and information constraints.

At the individual corporate level, researchers have noted that firms in sectors that employ more IT specialists, use more computers and provide more IT training to staff, are better equipped to mitigate the fallout stemming from a cyber event (Aldasoro et al. 2020). However, the challenges are multiplied by financial institutions grappling with cybersecurity issues of legacy applications and processes while simultaneously dealing with digital transformation efforts encompassing fintech, cloud-based mobile applications, and other developments. In addition to cloud-based solutions, innovations in the use of blockchain technology to enhance cyber risk management and embed cybersecurity applications into the enterprise's application development processes are all considerations in the strengthening of organisational resilience to cyber events.

Staff training is equally important. Firstly, the demand for cybersecurity specialists is growing rapidly, to the extent that the U.S. Bureau of Labour Statistics (BLS) projects that information security analysts will grow 31 percent from 2019 to 2029, compared to 11 percent for all computer occupations (BLS 2021). However, general staff training is equally important. Crucially almost all organisations have done cybersecurity training, with some engaging in cyber war gaming exercises with participation in some cases reaching the level of the board (Friedman 2016). Boards are also a crucial factor in ensuring cybersecurity in that their role is to verify that management has a clear perspective on how the business could be impacted, as well as the appropriate skills, resources and approaches, to minimise the likelihood of cyber incidents (Deloitte 2016).

Others have also emphasised other factors such as the value of integrating cyber risk management functions into the firm's wider enterprise risk management framework, the necessity of close cooperation between the chief information and security officers and chief risk officers in managing cyber risk and improving incident response frameworks among others (Santucci 2018).

Locally there have been some reported incidents of cyber-attacks, the nature of which reinforces the regulatory approach to focus on group-wide cyber-risk preventative measure. Therefore, the Central Bank's Bank Supervision Department is in the process of engaging licensed financial institutions on their cybersecurity practices. The information gathered will assist with the development and enhancement of supervisory tools and practices in the area of cyber risk assessment and provide guidance on the effective management and measurement of cyber risk.

Conclusion

Even with the emergence of frameworks aimed at addressing corporate cyber risk, it is likely to remain a critical issue given the growing importance of electronic based payments and activities. Issues surrounding cybersecurity are therefore likely to occupy regulatory authorities and the private sector for many years to come. Ultimately, the best technological solutions will be frustrated without the individual employee accepting responsibility for their contribution to the cybersecurity of their organisation, emphasising the necessary blend of technology and human factors in developing cyber resilience.

Table 1
Major Cyberattacks on Central Banks
(2010 – 2021)

	Year	Type of Attack	Details
Federal Reserve Bank of Cleveland	2010	Data breach	Theft of 122,000 credit cards
Federal Reserve Bank of New York	2012	Data breach	Theft of proprietary software code worth USD 9.5 million
Sveriges Riksbank	2012	Business disruption	Distributed Denial of Service (DDoS) attack left website offline for 5 hours
Banco Central del Ecuador	2013	Fraud	USD 13.3 million stolen from the account of the city of Riobamba at the central bank
Federal Reserve Bank of Saint Louis	2013	Data breach	Publication of the credentials of 4,000 US bank executives by Anonymous
Central Bank of Swaziland	2013	Fraud	Theft of USD 688,000
European Central Bank	2014	Data breach	20,000 email addresses and contact information compromised.
Norges Bank	2014	Business disruption	DDoS attack on the seven large financial institutions, resulting in suspended services during the day
Central Bank of Azerbaijan	2014	Data breach	Theft of thousands of bank customers' information
Bangladesh Bank	2015	Fraud	The SWIFT credentials of the Bangladesh central bank were used to transfer USD 81 million from its account at the FRBNY. Hackers attempted to steal USD 951 million
Bank of Russia	2016	Fraud	21 cyber-attacks aimed at stealing USD 50 million from correspondent banks at the central bank, resulted in a loss of USD 22 million.
Bank of Italy	2016	Data breach	Hack of email accounts of two former executives
Reserve Bank of New Zealand*	2021	Data breach	Data breach of the Bank's third-party file sharing service

*Sources: Bouvert (2018) and author(s) **

References

Aldasoro Iñaki, Leonardo Gambacorta, Paolo Giudici and Thomas Leach (2020), "Operational and Cyber Risks in the Financial Sector" BIS Working papers, No. 840, Monetary and Economic Department, Bank of International Settlements.

Boer Martin and Jaime Vazquez (2017), "Cyber Security and Financial Stability: How Cyber-Attacks Could Materially Impact the Global Financial System", Institute of International Finance, September.

Bouveret Antoine (2018), "Cyber Risk for the Financial Sector: A Framework for Quantitative Assessment", WP/18/143. IMF Working Paper.

Bureau of Labour Statistics, 2021, "Information Security Analysis", Occupation Outlook Handbook.

Carnegie Endowment for International Peace (2021), "Timeline of Cyber Incidents Involving Financial, Institutions", https://carnegieendowment.org/specialprojects/

protectingfinancialstability/timeline

Carter William (2017), "Forces Shaping the Cyber Threat Landscape for Financial Institutions", October, SWIFT Institute.

Committee on Payments and Market Infrastructures and International Organization of Securities Commissions (2016), "Guidance on Cyber Resilience for Financial Market Infrastructures", Bank for International Settlements, June.

Deloitte (2016) "Cybersecurity: The Changing Role of the Board and the Audit Committee", June, www.deloitte.com/in.

Eisenbach Thomas M, Anna Kovner and Michael Junho Lee (2021), "Cyber Risk and the US Financial System: A Pre-Mortem Analysis", Federal Reserve Bank of New York Staff Reports, no. 909, May.

Euro Cyber Resilience Board for Pan European Financial Infrastructures (2020) "Cyber Information & Intelligence Sharing Initiative: Community Rule Book", August.

European Central Bank (2020): "Cyber Information and Intelligence Sharing Initiative (CIISI-EU)", Euro Cyber Resilience Board Secretariat, September

Friedman Sam, (2016), "Taking Cyber Risk Management to the Next Level: Lessons Learned from the Frontlines at Financial Institutions", Deloitte University Press

G20 Research Group (2017), "Communiqué: G20 Finance Ministers and Central Bank Governors", University of Toronto, March.

Gogolin Fabian, Ivan Lim and Francesco Vallascas (2021), "Cyberattacks on Small Banks and the Impact on Local Banking Markets" Global Association of Risk Professionals White Paper, https://www.garp.org/risk-intelligence/all/all/a1Z1W000005lDiXUAU.

Healey Jason, Patricia Mosser, Katheryn Rosen, and Adriana Tache (2018), "The Future of Financial Stability and Cyber Risk, School of international and Public Affairs, Columbia University, The Brookings Institution, October.

Office of Financial Research (2017), "Cybersecurity and Financial Stability: Risks and Resilience", US Treasury Department.

Santucci Larry, (2018) "Quantifying Cyber Risk in the Financial Services Industry", Discussion Paper, DP 18-03, Consumer Finance Institute, Federal Reserve Bank of Philadelphia, November.

The Geneva Association (2016) "Ten Key Questions on Cyber Risk and Cyber Risk Insurance", The Geneva Association, Zurich.

Wilson Christopher, Tamas Gaidosch, Frank Adelmann and Anatasiia Morozova (2019) "Cybersecurity Risk Supervision", Money and Capital Markets Division, No. 19/15, IMF, September

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[8]	+
	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

[8] 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
Number of:						
Total DTIs	47	47	46	45	43	43
Commercial Banks	5	5	5	5	5	5
Finance, Trust and Mortgage	8	8	8	7	5	4
Credit Unions	34	34	33	33	33	33
Non-DTI Trust Companies	5	5	5	5	5	5
Insurance Companies	21	24	23	23	23	23
Life	6	8	7	7	8	6
Non-Life	15	16	16	16	15	15
Pension Plans	300	303	310	274	269	261
Mutual Funds	19	16	16	16	16	16
Assets to Total Financial System Assets (%)						
Total DTIs	69.9	68.9	68.0	67.1	66.0	66.4
Commercial Banks	54.8	54.3	53.1	52.8	51.6	51.6
Finance, Trust and Mortgage	7.1	6.3	6.2	4.2	4.0	3.9
Credit Unions	8.1	8.3	8.7	10.0	10.5	10.9
Non-DTI Trust Companies	0.1	0.1	0.1	0.1	0.1	0.0
Insurance Companies	13.2	14.0	14.0	14.4	14.7	14.6
Life	8.7	9.7	9.9	10.2	10.5	10.7
Non-Life	4.5	4.2	4.1	4.2	4.2	3.9
Pension Plans	8.8	8.8	9.1	9.7	9.6	9.4
Mutual Funds	8.0	8.2	8.7	8.8	9.7	9.6
Assets to GDP (%)						
Total DTIs	172.9	174.5	173.0	158.2	155.0	189.5
Commercial Banks	135.5	137.5	135.1	124.6	121.0	147.4
Finance, Trust and Mortgage	17.5	15.9	15.7	9.9	9.4	11.0
Credit Unions	19.9	21.1	22.2	23.6	24.6	31.1
Non-DTI Trust Companies	0.3	0.3	0.3	0.2	0.1	0.1
Insurance Companies	32.5	35.5	35.6	33.9	34.4	41.7
Life	21.4	24.7	25.2	24.0	24.6	30.6
Non-Life	11.1	10.8	10.4	9.9	9.9	11.0
Pension Plans	21.9	22.4	23.3	22.9	22.5	26.8
Mutual Funds	19.7	20.7	22.2	20.7	22.8	27.4
Memo:						
Credit Union Membership (000's)	176	186	195	206	216	222
Pension Plans Membership (000's)	31	29	29	28	26	24

Source: Central Bank of Barbados and Financial Services Commission

Table 2: Key Indicators of the Payment System

$ Millions	2015	2016	2017	2018	2019	2020
RTGs Transactions	30,731	33,561	36,781	27,001	11,668	14,771
ACH Transactions	18,689	18,501	19,584	19,559	19,293	17,268
Cheques	16,847	16,385	17,343	17,151	15,573	11,412
Direct Payments	1,842	2,116	2,241	2,408	3,719	5,855
Debit Card Transactions	1,067	1,136	1,197	1,248	1,324	1,223
ATM Transactions	620	639	660	675	698	611
Debit Card POS Transactions	447	497	537	573	626	612
Credit Card Transactions	664	737	725	717	739	646
Personal Sector	559	615	615	607	604	520
Business Sector	105	122	110	110	135	126
Currency in Circulation	668	730	750	784	829	890

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 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1
Solvency Indicators (%)										
Capital Adequacy Ratio (CAR)	15.8	17.0	17.0	13.8	13.5	14.6	14.9	15.8	16.0	15.9
Leverage Ratio	7.9	8.5	8.6	7.5	7.0	9.5	9.3	9.6	9.5	9.5
Liquidity Indicators# (%)										
Loan to deposit ratio	77.6	74.2	74.8	63.0	61.7	59.1	58.0	58.7	57.1	55.2
Transferable deposits to total deposits	88.6	90.3	90.1	92.3	94.8	95.1	95.7	95.8	95.9	95.9
Domestic transferable deposits to total domestic deposits	88.8	90.6	91.5	92.7	94.9	95.1	95.7	95.8	95.9	96.0
Liquid assets to total assets (Domestic)	29.9	32.5	32.6	17.6	19.3	20.2	21.0	22.1	22.9	25.7
Credit Risk Indicators (%)										
Total assets	4.1	4.0	1.4	-6.0	1.3	1.3	1.2	2.5	3.1	2.6
Domestic assets	4.2	3.5	0.9	3.0	3.3	2.9	3.4	5.0	4.1	7.1
Loans	-0.7	-0.6	1.4	-0.7	-0.6	-1.3	-1.9	-0.9	-2.1	-1.7
NPL ratio	10.2	8.6	7.7	7.4	6.6	6.9	6.8	7.2	7.3	7.9
Substandard loans/ Total loans	7.7	6.9	6.1	5.7	5.2	5.4	5.7	5.7	5.5	6.1
Doubtful loans/ Total loans	1.4	1.0	0.8	0.9	0.5	0.8	0.6	0.9	1.3	1.3
Loss loans/ Total loans	1.1	0.7	0.8	0.8	0.9	0.6	0.6	0.6	0.5	0.5
Provisions to NPLs	55.5	62.7	80.4	67.3	59.4	58.0	69.1	66.0	62.0	59.2
Foreign Exchange Risk Indicators (%)										
Foreign Currency Loans to Total Loans	5.3	5.1	4.4	4.0	2.9	2.1	2.1	2.2	1.8	1.8
Deposits in Foreign Exchange to Total Deposits	7.9	7.9	8.1	6.8	6.7	8.3	8.1	6.4	6.6	6.3
Profitability Indicators (%)										
Return on Assets (ROA)	1.4	1.5	1.3	-0.2	0.6	1.8	0.9	0.9	0.8	0.5
Net Interest Margin	4.7	5.0	5.2	5.3	5.7	5.7	5.7	5.5	5.4	5.2
Interest Rate Spread	5.4	5.7	5.8	6.0	6.1	6.0	6.0	5.8	5.7	5.5

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 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1
Solvency Indicators										
Capital Adequacy Ratio (CAR)	35.2	36.2	38.8	21.8	18.4	18.2	18.2	18.5	18.8	18.9
Leverage Ratio	19.7	21.3	22.0	11.5	11.2	11.4	11.3	12.1	12.1	12.3
Non-performing loans net of provisions to capital	14.4	13.8	12.5	26.6	47.0	46.0	54.2	44.2	42.5	52.1
Liquidity Indicators[#]										
Domestic Loans to domestic deposits	99.0	110.0	104.1	98.2	99.1	101.2	102.3	104.5	105.4	106.3
Transferable deposits to total deposits	15.0	12.1	18.6	1.4	2.6	3.5	3.7	3.8	3.7	4.5
Domestic liquid assets to domestic total assets	16.7	14.7	16.6	11.6	9.9	7.5	8.4	8.2	8.3	7.1
Credit Risk Indicators (percent)										
Total assets	1.0	(6.8)	2.4	(35.4)	(2.0)	(1.2)	(4.0)	(4.2)	(0.4)	(0.8)
Domestic assets	2.5	(7.1)	2.8	(35.5)	(3.8)	(3.4)	(6.2)	(5.3)	(0.2)	0.1
Total Loans and advances	(1.4)	(3.0)	(1.7)	(25.0)	(0.0)	1.6	(2.2)	2.2	2.8	(0.3)
Non-performing loans ratio	9.6	9.5	9.4	8.4	11.3	11.3	14.2	12.4	11.7	13.3
Substandard loans/ Total loans	6.1	6.3	6.4	6.8	8.9	8.5	11.8	9.8	9.3	11.0
Doubtful loans/ Total loans	2.6	2.5	0.8	0.6	0.6	0.7	0.6	0.8	0.9	0.9
Loss Loans/ Total loans	0.8	0.6	2.3	1.0	1.7	1.7	1.8	1.8	1.5	1.5
Provisions to non-performing loans	43.8	43.3	44.9	31.0	26.0	28.1	24.0	29.0	30.1	27.0
Foreign Exchange Risk Indicators (percent)										
Deposits in Foreign Exchange to Total Deposits	3.4	9.4	3.0	0.2	1.3	1.3	1.7	2.0	1.7	2.5
Profitability Indicators										
Return on Assets (ROA)	0.8	1.4	1.2	0.4	1.2	1.6	1.6	1.4	0.7	0.7
Net Interest Margin	4.0	4.2	4.7	4.7	4.5	4.5	4.3	4.4	4.5	4.3
Interest Rate Spread	3.9	4.2	4.7	4.4	4.5	4.4	4.3	4.3	4.3	4.2

Source: Central Bank of Barbados

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

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

Source: Financial Services Commission

Table 4: Life Insurance Performance Indicators

%	2015	2016	2017	2018	2019	2020[P]
Capital Adequacy						
Capital to Assets Ratio	31	43	46	45	46	48
Asset quality						
Rein. Ceded to GPW	7	12	14	11	11	11
Actuarial Risk						
Risk Retention Ratio	98	90	86	89	89	89
Earnings						
Return on Assets	5	6	5	6	5	4

P-Provisional data
Source: Financial Services Commission

Table 5: General Insurance Performance Indicators

%	2014	2015	2016	2017	2018	2019	2020[P]
Capital Adequacy							
Net Prem. / Capital	65	72	73	81	109	142	142
Capital to Assets Ratio	31	29	29	27	21	17	18
Asset quality							
Rein. Ceded to GPW	57	55	52	51	52	51	51
Actuarial Risk							
Risk Retention Ratio	45	47	49	51	50	52	52
Profitability and Earnings							
Loss Ratio	55	64	60	64	65	61	60
ROA	3	1	2	0	-3	2	4

Source: Financial Services Commission

Table 6: Mutual Funds Performance Indicators

	2016	2017	2018	2019	2020
Asset Concentration (Related Party Investments/Total Assets)	20.6	27.2	28.4	30.0	30.7
Liquidity (Liquid Assets/Total Assets)	8.4	7.7	6.1	6.3	4.9
Asset Growth Return on Net Assets (Net Income/Net Assets)	0.4	1.8	(5.3)	3.6	5.7
Growth in Net Assets Under Management	8.1	10.3	(3.8)	13.5	1.9

Source: Financial Services Commission