



FINANCIAL STABILITY REPORT 2020



CONTENTS

ABBREVIATIONS AND ACRONYMS	i
FOREWORD	iii
1. FINANCIAL STABILITY OVERVIEW	1
Box 1.1 Regulatory Initiatives to Fight Covid-19	5
2. MACRO-FINANCIAL DEVELOPMENTS	8
2.1. Overview	8
2.2. Global developments	8
2.3. Domestic environment	9
Box 2.1 Housing Market Developments	10
3. FINANCIAL SYSTEM DEVELOPMENTS	15
3.1. Overview	15
3.2. The financial system	16
3.3. Deposit-taking institutions	16
3.4. Non-deposit-taking financial institutions	21
3.5. Measures of financial	26
3.6. Payment system developments	27
3.7. Concentration risk in the Large-value system	32
Box 3.1 Financial Deepening 2020 Initiatives	34
Box 3.2 Bank of Jamaica FinTech Regulatory Sandbox	37
Box 3.3 Greater Deposit Insurance Coverage	39
Box 3.4 MSME Finance Charting the way for recovery after COVID-19	42
4. FINANCIAL SYSTEM SECTORAL EXPOSURES	43
4.1. Overview	43
4.2. Household debt and deposit-taking institutions' exposure	43
4.3. Deposit-taking institutions' exposure to corporate sector debt	45
4.4. Deposit-taking institutions' exposure to the public sector	47
4.5. Non-deposit-taking financial institutions' sector exposure	49
4.6. NDTFIs exposure to real estate and equity	51
4.7. Pension industry exposure to government securities, equities & real estate	52
Box 4.1 Debt Repayment Capacity of Non-Financial Companies Listed on Jamaica Stock Exchange	53
5. RISK ASSESSMENT OF THE FINANCIAL SECTOR	55
5.1. Overview	55
5.2. Composite indicators	55
5.3. Risk exposure assessment of deposit taking institutions	57
5.4. Liquidity funding risk assessment for deposit taking institutions	57
5.5. Market risk assessment of deposit taking institutions	59
5.6. Credit risk assessment for deposit taking institutions	60
5.7. Risk exposure assessment for securities dealers	62
5.8. Liquidity funding risk assessment of securities dealers	63
5.9. Interest rate risk assessment of securities dealers	64
5.10. Foreign exchange risk assessment of securities dealers	64

5.11. Evolution of risk indicators – life and general insurance companies	65
5.12. Foreign exchange risk assessment of insurance companies	65
5.13. Market and interest rate risk assessment of insurance companies	65
5.14. Liquidity funding risk assessment of insurance companies	66
6. INTERCONNECTEDNESS AND SPILLOVER RISKS	67
6.1. Overview	67
6.2. Contagion and spillover risks	68
6.3. Gross funding in the financial system	68
6.4. Clusters	70
6.5. Financial groups	71
6.6. Systemically important banking groups	72
6.7. Evaluation of the JamClear®–RTGS payment system network topology interconnectedness	72
6.8. Stress tests	73
Box 6.1 Wire Transfers	74
APPENDIX	78
GLOSSARY	81

ABBREVIATIONS AND ACRONYMS

ABM	Automated Banking Machine	FSR	Fiscal Stability Ratio
ACH	Automated Clearing House	FSSC	Financial System Stability Committee
AFSI	Aggregate Financial Stability Index	FX	Foreign Exchange
BAML–GFSI	Bank of America Merrill Lynch Global Financial Stress Index	FUM	Funds Under Management
BINS	Benchmark Investment Notes	GDP	Gross Domestic Product
BIS	Bank for International Settlement	GI	General Insurance
BN	Billion	GOJ	Government of Jamaica
BOJ	Bank of Jamaica	GOJGB	Government of Jamaica Global Bonds
BPS	Basis Points	GWP	Gross Written Premium
CAR	Capital Adequacy Ratio	HHI	Herfindahl–Hirschman Index
CD	Certificate of Deposit	ICs	Insurance Companies
CIS	Collective Investment Schemes	LI	Life Insurance
CISS	Composite Indicator of Systemic Stress	JDX	Jamaica Debt Exchange
CPI	Consumer Price Index	JSE	Jamaica Stock Exchange
CRE	Credit Risk Exposure	LSCRI	Large–Value System Concentration Risk Index
CSD	Central Securities Depository	LCR	Liquidity Coverage Ratio
CY	Calendar Year	MaFI	Macro–Financial Index
D–SIB	Domestic Systemically Important Bank	MCCSR	Minimum Continuing Capital and Surplus Requirements
DTI	Deposit–taking Institution	MCT	Minimum Capital Test
DVBP	Dollar Value of a Basis Point	MiPI	Micro–Prudential Index
EMBI+	Emerging Market Bond Index	NDTFI	Non–Deposit–taking Financial Institution
ERPS	Electronic Retail Payment Services	NDX	National Debt Exchange
FSC	Financial Services Commission	NIR	Net International Reserves
FSI	Financial Soundness Index	NOP	Net Open Position

POS	Point-of-Sale	NPL	Non-Performing Loan
REER	Real Effective Exchange Rate		
ROA	Return on Asset		
ROE	Return of Equity		
RTGS	Real-Time Gross Settlement System		
RWA	Risk-Weighted Assets		
SD	Securities Dealer		
SIFI	Systemically Important Financial Institution		
The Bank	Bank of Jamaica		
VIX	Volatility Index		
WTI	West Texas Intermediate		

FOREWORD

The maintenance of financial stability by the Bank of Jamaica (BOJ) primarily concerns the safeguard of conditions which ensure the proper and efficient functioning of the financial system and, consequently, the promotion of real economic activity. The financial system consists directly of three basic financial components: institutions, markets and infrastructure.¹ These components interact with each other as well as with other indirect participants in the system – such as households, nonfinancial corporations and the public sector – to allocate economic resources and redistribute financial risks.

Aside from the supervision of deposit-taking institutions (DTIs), BOJ is charged with the responsibility of ensuring that the overall financial system is robust to shocks and that participants are assured of its robustness. This entails making sure that financial institutions are sound. The maintenance of financial stability by the Bank also involves overseeing the efficient and smooth determination of asset prices, making certain that participants are able to honour promises to settle market transactions and preventing the emergence of systemic settlement risk arising from various financial imbalances that may develop within individual institutions or the system.

The Financial Stability Report 2020 provides an assessment of the main financial developments, trends and vulnerabilities influencing the stability of Jamaica's financial system during the year. The data utilized for the analyses are at end-2020 except in some instances where data were available for end-September 2020.

The Report covers:

- i) an overall assessment of financial stability;
- ii) macro-financial risks;
- iii) financial system developments;
- iv) financial system sectoral exposures;
- v) risk assessment of the financial system; and
- vi) payment system developments.

Comments and suggestions from readers are welcomed. Please email your feedback on this report to library@boj.org.jm.

¹ For the purpose of this report, financial institutions include banks, securities dealers and insurance companies. Financial markets include foreign exchange, money and capital markets. Financial market infrastructure refers to payment and securities settlement systems.

1.0 FINANCIAL STABILITY OVERVIEW

During 2020, the fallout from the global pandemic had far reaching effects on Jamaica, resulting in major changes in the risk profile of the domestic financial system. The risks to domestic financial system stability were elevated relative to previous years but remained moderate. Deteriorating macroeconomic conditions, globally and domestically, coupled with a worsening of the fiscal accounts contributed to the increased risks. However, the financial system network showed improvements in measures of contagion risks and interdependence.

Bank of Jamaica’s macroprudential framework examines systemic risk along the following dimensions:

- excessive credit growth & leverage;
- excessive maturity mismatches & market illiquidity;
- direct and indirect exposure concentrations;
- excessive interconnectedness & systemic importance of institution; and
- overall resilience to financial shocks.

Macro-financial environment

The domestic macroeconomic environment deteriorated notably during 2020 due to the realities of the pandemic which led to reduced operations within a number of key economic sectors. While inflation remained within the target band throughout the year, the domestic economy is estimated to have contracted by 10.2 per cent for the year. There was also a faster rate of depreciation of the exchange rate and a rise in unemployment to its highest level since 2017. Additionally, the government’s efforts to keep the economy buoyant while addressing the ongoing health crisis, also within the context of falling revenues, the result of which was a deterioration in the fiscal accounts.

The global economy was also significantly affected by the pandemic which resulted in

economic contraction in the global GDP of 3.5 per cent for the year. This downturn was accompanied by increased volatility in financial markets as well as heightened financial stress.

Despite the notable slowdown in economic activity, private sector credit continued to grow, albeit more slowly. As such, the disparity between the growth in private sector credit as a proportion of GDP and its long-term trend (The credit to GDP gap) deteriorated above the BOJ’s lower threshold of 2.5 per cent, but remained below the Bank of International Settlements’ (BIS) signal threshold of 10.0 per cent. This occurred within the context of continued accommodative monetary policy as well as generally favorable liquidity conditions within the review period (see **Chapter 2**).

Furthermore, there was a general deterioration in leverage across the financial system, largely due to lower asset prices.¹ Additionally, the maturity mismatch statistics for domestic financial entities worsened. However, measures of liquidity improved for the year.

Financial system sectoral exposures

The domestic financial system was adversely impacted by the contraction in the real domestic economy during 2020. In the context where personal loans remained the largest loan category for DTIs, the capacity of households to service debt deteriorated during the review period.² However, the corporate sector reflected a notable expansion in credit. In particular, the tourism sector became DTIs’ second largest non-financial corporate sector loan exposure. This result was coupled with a deterioration in loan quality, particularly from the tourism sector, which served to increase the risk of default from the corporate sector. However, overall default risks were mitigated by moratoria on loan repayments offered by DTIs during the second quarter of 2020.

¹ Leverage is defined as the ratio of debt to equity

² The debt servicing capacity of households is measured by the debt to income ratio as well as the debt servicing ratio (see **Chapter 4**)

Within the context of the generally worsened economic conditions, government spending increased significantly, which partially contributed to the reversal of the downward trend in the public sector debt to GDP ratio of the last five years. Notwithstanding, non-deposit taking financial institutions (NDFIs) generally had continued reductions to their exposure to public sector debt (see **Chapter 4**).

However, there was a notable flight to safety in the pension industry as the sector's investment in government securities increased at the expense of their investment in equities. This can be attributed to the significant reduction in returns from the equities markets during 2020 (see **Chapter 4**).³

Risk assessment of the financial system

Network analysis revealed a reduction in the risks to the financial system from interconnectivity. Specifically, there were improvements in the systemic risk score which indicated a reduction in contagion. Similarly, the fragility of the network, due to concentration improved marginally, as evidenced by reductions in the fragility score. Despite this recent outturn, the system remains characterized by significant contagion and concentration risks. Additionally, DTIs and securities dealers continued to be the most significant contributors within the financial system network.

Both DTIs and securities dealers were more susceptible to funding and credit risks as a result of the effects of COVID-19, as evidenced by their stress test results. Notably, systemically important financial groups were susceptible to foreign exchange and interest rate shocks. Of note, these financial groups also had high scores on the contagion index, which indicates the presence of spillover risks from the interbank network (see **Chapter 6**).

DTIs remained robust to the contemplated credit, liquidity and market related shocks, because of

their strong capitalization. However, securities dealers showed vulnerability to the interest rate shocks due to fair value losses, while insurance companies were increasingly susceptible to interest rate and foreign exchange shocks (see **Chapter 5**).

New Developments

The global economy is anticipated to experience notable, albeit uneven, recovery within the coming year. In particular, global growth is projected to be 5.5 per cent for 2021, driven by a pickup in activities arising from the progress of the vaccine rollout in many large economies. Although the rollout of vaccines in Jamaica is expected to be slower than most countries within the region, the reopening of large foreign markets is expected to have strong spillover effects on the Jamaican economy.

Against this background, the domestic economy is expected to expand in the second half of 2021. This growth is expected to be supported by planned infrastructure projects by the government as well as normalization within the mining sector following the closure of a large production plant in 2019.

Regarding the housing market, the Bank has advanced its monitoring of price changes to gain a wider view on the possible risks that may be posed to the financial system. Based on data from the National Housing Trust (NHT) and the National Land Agency (NLA), the housing price results were found to be mixed. Residential property prices in the Kingston and St. Andrew region have been rising, however, these increases were not excessive in the context of the overall macroeconomic conditions. On the other hand, commercial property prices have been gradually declining since 2019, across the entire island.

There was a general deterioration in the debt repayment capacity of publicly listed non-financial corporations based on an assessment

³ Non-deposit-taking financial institutions include pension funds, collective investment schemes, securities dealers, life insurance companies and general insurance companies.

for the period June 2018 to June 2020. Notably, there was significant increase in leverage, particularly during the pandemic period, which elevates credit risk within the non-financial corporate sector. Although leverage ratios remain moderate, there could be further worsening in these measures if domestic economic conditions continue to deteriorate.

Financial deepening has been a key focus of the Bank and its stakeholders for the past two years and in the upcoming year a number of milestones are expected to be met. There are plans to list and trade GOJ local securities on the Jamaica Stock Exchange to facilitate efficient price discovery and increased market information. While, the recently established private market facilitates the trading of private placements of equities and debt. In addition, the reverse factoring platform will be implemented, and there will be continued work on public private partnerships (PPP) and privatization transactions for non-core government assets.

With the established framework for macroprudential policy, the Bank of Jamaica is developing tools to actively mitigate the buildup of systemic risks, as mandated by the amended Bank of Jamaica Act (2015). The Bank has begun work on the development of the counter cyclical capital buffer (CCyB), which is a tool used to dampen the impact of procyclicality within the financial system.

Furthermore, driven by the interconnected nature of the domestic financial system, the Bank has embarked on a joint project with the Financial Services Commission (FSC) to enhance surveillance of the insurance sector and the private pension industry. The committees for these projects will utilize stress testing frameworks initially developed by the International Monetary Fund (IMF) to assess the resilience of these vital sectors. The results from these projects are expected to better guide the overall macroprudential policy framework of the Bank.

Following the development of the FinTech Regulatory Sandbox Guidelines in March of 2020, the Bank has begun accepting applications from eligible entities for the programme. The FinTech regulatory sandbox is aimed at advancing

digitization and innovation within the financial sector, to promote efficiency and inclusion while monitoring emerging risks to the financial system. Since its introduction, three pilots have been approved, one of which has commenced. The initial pilot is the Central Bank Digital Currency (CBDC) which is expected to be available to the market in the first quarter of 2022. Further applications are also expected within the coming year from eligible entities which may be outside the financial sector.

Arising from the established threats posed by the ongoing phenomenon of climate change, the BOJ has committed to integrating the monitoring of climate risks to its surveillance of the financial system. The risks posed by climate change to the real economy has been more widely quantified, however, the risks to the financial system is still in the rudimentary stages of evaluation. The BOJ is planning to engage its stakeholders with discussion papers and workshops. These initiatives will be used to inform the research projects aimed at accurately quantifying the specific physical and transitional risks posed to the financial system in Jamaica.

COVID-19 has had a significant adverse impact on Jamaica's business sector and has disrupted the characteristic features of the markets within which they operate. However, these developments have created opportunities for a new digital economy. As such, the New Economy Task Force was formed to facilitate this transformation. The task force is comprised of key entities from the public and private sector, including the Bank of Jamaica. To aid this effort, legislative amendments were made to simplify due diligence requirements for medium, small and micro enterprises (MSMEs) engaging the banking sector. Additionally, these businesses were aided in setting up digital platforms to facilitate international transactions, and were provided with technical guidance by industry leaders. These projects are ongoing and are expected to create jobs, generate foreign exchange, increase deposits in the financial system and help boost Jamaica's economic recovery.

Furthermore, effective 31 August 2020, the Jamaica Deposit Insurance Corporation (JDIC) expanded the coverage limit on deposits from \$600,000 to J\$1,200,000. With this expansion, the scheme now covers approximately 98.0 per cent of the deposit accounts in the system. The decision was made to expand the limit primarily due to the loss of real value due to inflation. This policy is expected to further boost confidence and enhance the financial sector's resilience to liquidity shocks.

Box 1.1 Regulatory Initiatives to Fight the Economic Impact of COVID-19

In response to the economic challenges created by the COVID-19 pandemic, the BOJ and the Financial Services Commission (FSC) undertook several initiatives to safeguard financial system stability. In the early stages of the shock, the FSC identified the potential negative effects that extreme volatility in asset prices and funding liquidity pressures could have on redemptions of collective investments schemes (CIS). Therefore, the FSC intensified its supervisory activities for a more proactive and flexible approach in the areas of insurance, securities and private pension. At the same time, Bank of Jamaica focused on ensuring that adequate market liquidity, in both Jamaica and U.S. currencies, was available in the financial system. Both entities, engaged in continuous dialogue from the onset given the interconnectedness of the financial sector and the need for synergy in regulatory responsibilities.

A. Enhanced supervisory measures undertaken by the FSC for Non-deposit Taking Financial Sectors include:

1. Increased surveillance of the insurance and the securities dealers sectors

1.1. Insurance companies and securities dealers were required to conduct more frequent filing of liquidity pressures. These filings related to daily and weekly reporting of liquidity positions and cash flow activities of the securities dealers. This included their CIS business as well as on balance sheet client obligations.

2. Adapting the prudential requirements to help entities manage the challenges arising from the COVID-19 pandemic

Given the adverse and continued impact of the COVID-19 pandemic on the Jamaican economy, the FSC made the following decisions in order to ensure that the regulated entities will have adequate capital and liquidity to manage the challenges that they may face. This involved:

- 2.1. Exercising regulatory forbearance regarding:
 - i. investment and funding limits for CIS and
 - ii. large exposures reported above the transitional limit of 95 per cent reviewed on a case by case basis.
- 2.2. Suspending the implementation of the retail mismatch ratio
- 2.3. Relaxing the requirement to present an action plan for breaches of the early warning limits for the Capital to Risk Weighted Assets ratio of 14 per cent pursuant to the Guidelines to the Securities Prudential Regulations, 2014
- 2.4. Requiring insurance companies and securities dealers to notify the FSC ten (10) days before any dividend payments are made and
- 2.5. Granting of extensions to a number of regulated entities for the submission of their routine periodic statutory filings.

3. Strengthening business continuity

Insurance companies, pension administrators and pension investment managers were required to submit business continuity plans (BCP) to the FSC. These plans were reviewed by the FSC, and where necessary, the FSC recommended improvements and changes that companies should make to their BCPs. In addition, the securities dealers were required to provide a liquidity recovery plan to the FSC. Similarly, these plans were reviewed by the FSC and where necessary dealers were required to revise their plans.

4. Greater communication and collaboration

The FSC adopted a three-pronged approach of enhanced dialogue with stakeholders including regulated entities as well their respective

industry associations, the Bank of Jamaica and the general public. To this end, the FSC:

- 4.1. Issued guidance documents, tips and notices including information released on social media and directly to industry stakeholders and provided guidance on the purchasing of annuities for pension plans of members who may be retiring during this period.
- 4.2. Maintained open communication with stakeholders to provide more feedback while tracking the possible impacts of the pandemic on the industry. This included:
 - i. Consultation with pension stakeholders on a number of proposed legislative amendments to alleviate the financial burden due to the COVID-19 on members and sponsors of pension plans. From these consultations, the Pensions (Superannuation Funds and Retirement Schemes) (Repeal and Replacement) Bill now includes proposals to ease financial obligations for members and sponsors of pension plans related to the payment of contributions and
 - ii. A special advisory group, comprised of the FSC and pension stakeholders, was established to facilitate more enriched collaboration and dialogue in order to respond effectively to challenges arising from the pandemic.

B. Enhanced supervisory measures undertaken by the BOJ for DTIs:

1. Suspension of punitive measures against DTIs with loans on moratoria:

5.1 In an effort to ease the burden on customers, DTIs offered moratoria to help

borrowers who are experiencing temporary difficulties with their loan payments. Under this moratorium arrangement, loans were not to be classified as ‘non-performing’ over the period for which a moratorium was applied.

2. Provision of liquidity facility for credit unions

2.1 BOJ designated credit unions as financial institutions for financial stability purposes under Part VB, Section 34L of the Bank of Jamaica Act. This provided the BOJ with the legal authority to lend to the sector for purposes of financial stability.

2.2 BOJ consequently established a \$4.0 billion repurchase facility to make credit available to the credit union sector. The facility, which required the collateralization of unencumbered GOJ and/or BOJ securities for the period of the borrowing arrangement, was established to provide funding to credit unions facing liquidity challenges. These challenges could arise from a withdrawal of shares by members and/or a fallout in loan repayments due to the offer of loan moratoria to members.

3. Encouraged the suspension of dividend payment by DTIs

3.1 In May 2020 the Bank received the commitment of Financial Holding Companies (FHCs) and DTIs to make limited dividend distributions in an effort to encourage the preservation of DTIs’ capital in light of the pandemic. Furthermore, in December 2020, DTIs further agreed not to declare or pay any dividend over the following two quarters until June 2021. However, FHCs may declare dividends with these payments being limited only to shareholders that own 1 per cent or less of the outstanding shares in the FHC.

4. Support of market liquidity

The Bank provided market liquidity assistance to the financial system through the following

initiatives. Reduced the Jamaica Dollar and foreign currency cash reserve requirements for DTIs

4.1 Offered a bond-buying programme to DTIs and securities dealers, for GOJ and BOJ securities

4.2 Removed the limit on the amounts that DTIs can borrow overnight without being penalized

4.3 Re-activated the Emergency Liquidity Facility that was established in 2015

4.4 Re-activated an intermediation facility in which BOJ facilitates lending between financial institutions

4.5 Offered direct sales of foreign currency to major players in the energy sector and

4.6 Expanded the volume of foreign currency swap arrangements and the provision of a US dollar repurchase facility.

Going forward, both the FSC and BOJ will continue to assess the impact of the COVID-19 pandemic on the regulated entities with a view of implementing an adequate response in order to protect consumers and maintain financial stability.

2.0 MACRO-FINANCIAL DEVELOPMENTS

This chapter examines the risks and vulnerabilities due to macroeconomic developments.

2.1 Overview

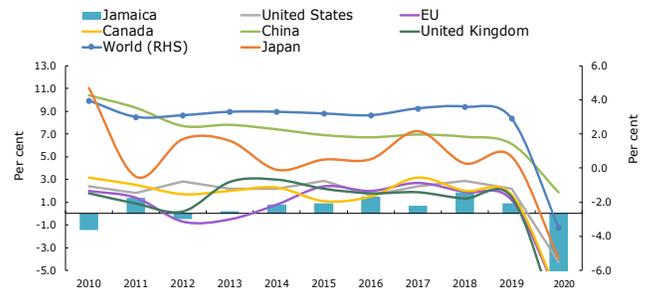
There was a deterioration in the macro-financial environment during 2020. Specifically, economic activity in both the global and domestic markets declined due to the COVID-19 pandemic. Furthermore, there was heightened volatility in both international and domestic financial markets.

2.2 Global developments

Risks emanating from the global environment were heightened for the review period due to the impact of the ongoing COVID-19 pandemic. Notable developments in the global economy included increased volatility in financial markets as well as heightened financial stress. There was an estimated contraction of 3.5 per cent in the global economy which for 2020 relative to growth of 2.9 per cent for 2019.¹

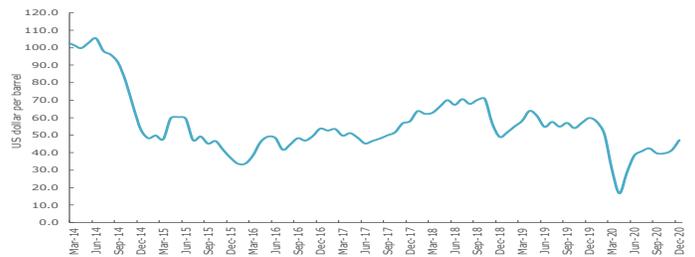
The decline in global economic growth reflected contraction in some advanced and emerging economies and deceleration in others (see **Figure 2.1**).² In particular, China experienced slower growth of 1.6 per cent in 2020 compared to growth of 6.1 per cent in 2019, while the USA, United Kingdom, European Union and Canada experienced economic decline for 2020 relative to 2019. The overall decline in the global economy precipitated a fall in oil prices

Figure 2.1 GDP growth rates of selected countries



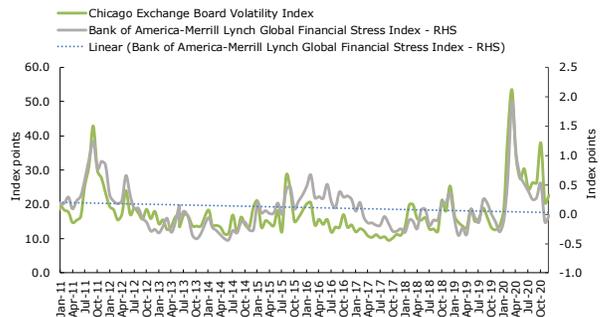
Source: IMF World Economic Outlook

Figure 2.2 West Texas Intermediate oil prices



Source: Bloomberg

Figure 2.3 International financial market indicators



Source: Bloomberg

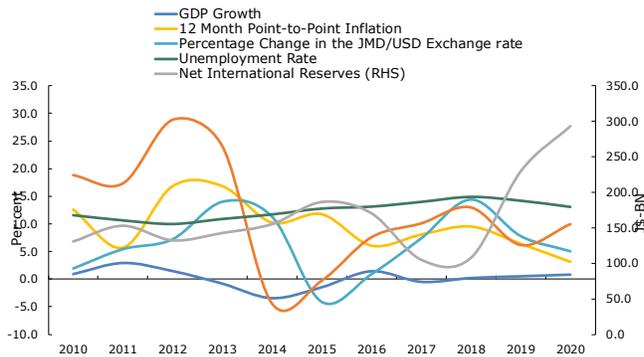
Note: (i) The BAML-GFSI is a calculated, cross market measure of risk, hedging demand and investor flows in the global financial system. Values greater than 0 indicate more financial market stress than normal while values less than 0 indicate less financial stress than normal. (ii) The VIX reflects a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

¹ See IMF World Economic Outlook Update October 2019.

² Contraction in the USA economy largely reflected negative contributions from personal consumption expenditure, private inventory investment and government spending. The slowing in EU growth was reflective of, weaker external demand and domestic risks related to Brexit and high-debt EU members. China's outturn was attributed to weaker foreign trade positions and slower credit growth as well as

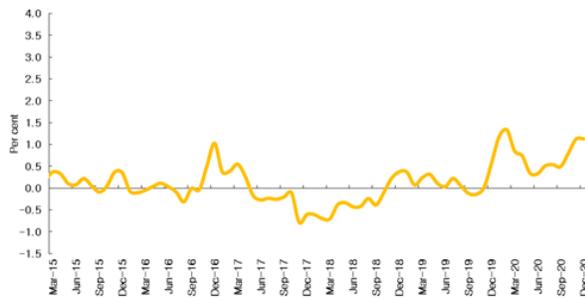
higher tariffs. The contraction in Canada's economy was attributed to weaker consumer spending and tighter monetary policy in other countries. The UK's marginal decline reflected losses in services output and industrial production as well as continued uncertainty surrounding Brexit.

Figure 2.4 Selected domestic macroeconomic indicators



There was an increase in volatility in global financial markets during 2020, as measured by the Chicago Board Options Exchange Volatility Index (VIX) and The Bank of America Merrill Lynch Global Financial Stress Index (BAML-GFSI) (see **Figure 2.3**). Heightened financial market stress was most evident in the March and June 2020 quarters, which resulted from increased political and global trade tensions as well as major fluctuations in investors' confidence.

Figure 2.5 TRE spread

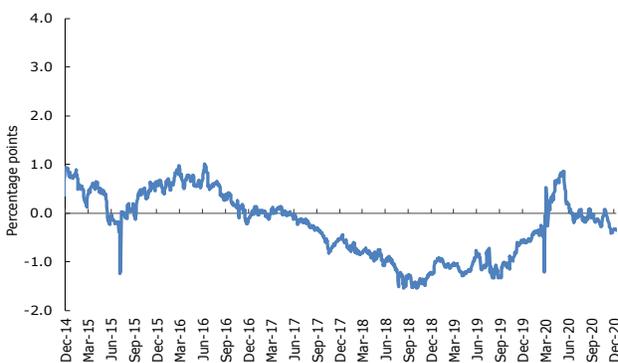


Note: The TRE spread measures the premium priced in the repo rate for default risk and is computed as the difference between the 30-day private money market repo rate and the 30-day T-bill rate.

2.3 Domestic environment

Macroeconomic conditions in Jamaica deteriorated for the review period. Specifically, GDP is estimated to decline by 10.2 per cent for 2020, while inflation remained low and stable. Additionally, there was a deterioration the fiscal position and the unemployment rate. Meanwhile, there was depreciation in the domestic exchange rate. However, inflation remained low and stable (see **Figure 2.4**).

Figure 2.6 Spread between GOJ global bonds and EMBI+



Source: Bloomberg

The annual point-to-point inflation decreased by 0.9 percentage point to 5.3 per cent at end-2020, relative to end-2019. In addition, the unemployment rate increased by 2.8 percentage points to 10.7 per cent at end 2020, reflecting weakened labour market conditions. Also, the Jamaica Dollar vis-à-vis the United States dollar depreciated by 7.6 per cent for 2020 relative to depreciation of 3.8 per cent for the prior year. This outturn was largely due to lower foreign exchange inflows, especially from the tourism sector.

due to the global pandemic. Specifically, West Texas Intermediate (WTI) oil prices decreased by 30.9 per cent to an average of US\$39.40 per barrel for 2020 (see **Figure 2.2**).

In the context of economic uncertainties and reduced investor confidence over the review period, there was widening of the TRE spread and the spread between GOJ Global Bonds composite yield (GOJGB) and the Emerging Market Bond Index (EMBI+) (see **Figure 2.6**). The average monthly TRE spread increased to 1.1 per cent from 0.6 per cent for 2019. This was due to a decline in the 30-day T-Bill and repo rates (see **Figure 2.5**). In addition, the spread between GOJGB and EMBI+ widened over the review period (see **Figure 2.6**).

Box 2.1 Housing Market Developments

Following improved macroeconomic and lending conditions over the period 2015 to 2019, there were several initiatives aimed at enhancing accessibility to homeownership in Jamaica. The ensuing increased demand for housing solutions led to growing concern about the potential for a bubble in the housing market. In light of this, the Bank embarked on various assessments to shed light on this issue, including continuing work on the development of:

- i. a local housing price index to give a fair representation of price trends in key market segments; and*
- ii. a model-based approach to determine whether housing prices in Jamaica were over- or under-valued relative to fundamentals.*

1. Empirical Assessment of Housing Price Bubble

According to Case and Shiller (2004), a bubble represents cases where “Excessive public expectations of future price increases cause prices to be temporarily elevated.” That is, when housing prices grow faster than fundamentals can explain, it might signal the emergence of a bubble. The empirical exercise to evaluate housing price misalignments included:

1.1 Computation of a repeat sales housing price index from data obtained from the National Land Agency (NLA) utilizing the April 2019 Standard & Poor (S&P) CoreLogic Case–Shiller Home Price Indices Methodology; and

1.2 Estimation of a Vector Error Correction Model (VECM) to unveil fundamentally determined, equilibrium housing price indices for the identification of over or

underpricing within the market. This activity explored the influence of 29 distinct variables that captures fundamental endogenous and exogenous influence as guided by literature and classified as either economic, demographic, legislative or environmental.¹

In computing the Repeat Sales Housing Price Index – Employing the Standard & Poor (S&P) CoreLogic Case–Shiller Home Price Indices Methodology (April 2019), the formulation adopted is labelled the “Interval and Value–Weighted Arithmetic Repeat Sales Indices”. It is developed from an estimate of home prices based on a matrix of independent variables corresponding to each time interval that records the instances of a sale based on the following equation: $Y=X\beta+\epsilon$

Where Y is an $(N \times 1)$ vector of house prices that can be paired with a previous purchase; X is a matrix with N rows and $(T-1)$ columns that reflects the pair of sale prices in the column corresponding to the respective time period (t) for the N th pair of repeat prices; β is a column vector of coefficients with $(T-1)$ rows and; ϵ is a vector of error terms.

In order to obtain consistent estimates of β , an instrumental variables approach done using OLS is employed such that $\beta=(Z'X)^{-1}Z'Y$ and where Z reflects $[1$ and $-1]$ corresponding to final and initial price in X , respectively. The method is characterized as being value weighted due to the price matrix influence on each estimated β for a given time interval.

The method is also interval weighted due to the potential for heteroscedasticity that may arise from variation in time intervals between property sales. The longer the time period between sales, the more likely will non–market factors such as, property deterioration, modifications

¹ Refer to Marku, Lleshaj, & Lleshaj, 2020 and Arestis & Gonzalez, 2014

or even abandonment, affect the price of homes.

Correction for heteroscedasticity is achieved by weighting each sale price by the time interval between sales before estimation of the index, represented as $(1/\beta)$.

Implementing the Vector Error Correction Model (VECM) for determining Equilibrium Housing Prices utilizes a similar method to that employed by (Arestis & Gonzalez, 2014) and (Marku, Lleshaj, & Lleshaj, 2020). The assessment includes unit root tests for stationarity and cointegration tests among the long-run variables with the aid of trace statistic and maximum eigen value test as a precursor to estimation. Following confirmation of a system of cointegrated variables, lag length tests are carried out with the aid of the Schwarz, Akaike and Hannan-Quinn Information Criterion.

The VECM model is then estimated using appropriate lags and fundamental variables that have first order integration $I(1)$. For stable results it is required that the inverse roots of the autoregressive characteristic polynomial all fall within the unit circle. Furthermore, the parameters on long-run variables must be significant with signs that can be justified in theory. The estimation results must also reflect a negative and significant parameter on the cointegrating error term. Post estimation evaluation also requires that impulse response functions reflect a convergence to new steady states over time.

The data used in the assessment was obtained from the National Land Agency, Statistical Institute of Jamaica (STATIN), the National Housing Trust (NHT) and BOJ. Quarterly data were utilized for the period September 2004 to September 2020. After constraints and verification exercise, housing price information obtained from the NLA included 7 200 instances of residential property prices within the Kingston & St. Andrew (KSA) and St. Catherine regions combined. When adjusted for instances of

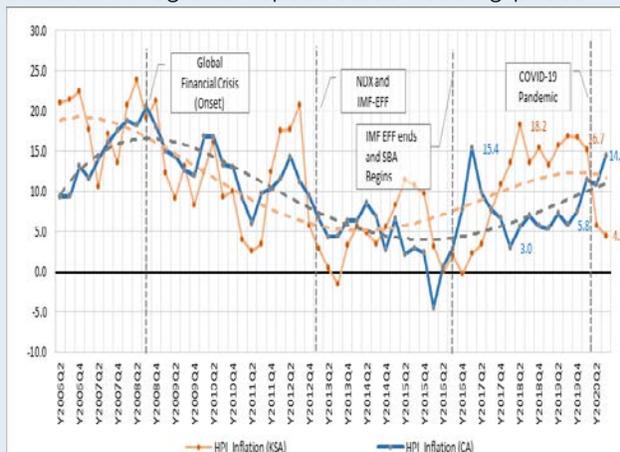
repeat sales, there were 2 613 unique data points.

Estimates of the Repeat Sales Housing Price Index (HPI), reflects an annual average trend increase in housing prices over the 16-year period ending September 2020 (see **Figures 1 & 2**). Furthermore, trend analysis showed that subsequent to the global financial crisis in 2008, the pace of growth of housing prices slowed. This slowdown was stronger in KSA relative to St. Catherine which featured a more gradual deceleration. The deceleration tempered after 2013 with the commencement of the economic programme under the IMF Extended Fund Facility (EFF). However, subsequent to 2016, when the EFF ended and the IMF Precautionary Stand-By Arrangement begun, residential prices began to rebound, especially in the KSA region. However, there was a downward adjustment in prices in KSA subsequent to the March 2020 quarter when the effects of the COVID-19 pandemic escalated.

Figure 1 Regional repeat sales housing price indices



Figure 2 Annual point-to-point growth in house inflation in regional repeat sales housing prices



2. Results

The VECM used to estimate equilibrium trends among best fit, economically consistent and parsimonious cointegrated relationships (variables) showed that house prices in KSA are positively influenced by local consumer prices (CPI). However, house prices were negatively influenced by the unemployment rate and equity market performance (JSE Main Index). For St. Catherine, house prices were positively influenced by trends in US consumer prices (imported inflation) but negatively influenced by local mortgage rates among banks. Results from the model showed that house prices within the KSA region had a statistically significant relationship with changes in stamp duty, during the period of the IMF-EFF as well as following the onset of the COVID-19 pandemic (see **Table 1**).

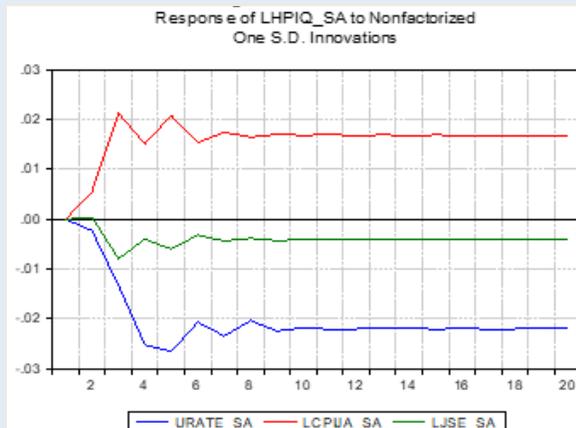
Table 1 Estimation Results from VECM

Variable	Expected Sign	VECM 1 (Kingston & St. Andrew)			VECM 2 (St. Catherine)		
		Parameter	SD	T-Stat	Parameter	SD	T-Stat
Housing Price Index							
Unemployment Rate	[-]	-6.05	1.22	-4.97	--	--	--
CPI Jamaica	[+]	1.39	0.08	16.62	--	--	--
CPI US	[+]	--	--	--	3.94	0.37	10.56
Mortgage Rate	[-]	--	--	--	-2.31	0.62	-3.35
JSE Index	[+/-]	-0.13	0.06	-1.99	--	--	--
Constant	[+/-]	-0.07	--	--	-16.17	--	--
Error Correction	[-]	-0.70	-0.17	-4.10	-0.21	-0.08	-2.68
Model Description		Vector Error Correction Estimates Date: 12/08/20 Time: 17:13 Sample (adjusted): 2005Q2 2020Q3 Included observations: 62 after adjustments			Vector Error Correction Estimates Date: 12/08/20 Time: 02:24 Sample (adjusted): 2005Q2 2020Q3 Included observations: 62 after adjustments		
R-squared		0.626427			0.394177		
Adj. R-squared		0.53494			0.315645		
Sum sq. resids		0.209409			0.117514		
S.E. equation		0.065373			0.04665		
F-statistic		6.847153			5.019284		
S.D. dependent		0.095862			106.344		
Exogenous Vars		[STAMP_DUTY_ADJ] [IMF_EFF] [COVID19]			N/A		

3. Impulse Response Analysis

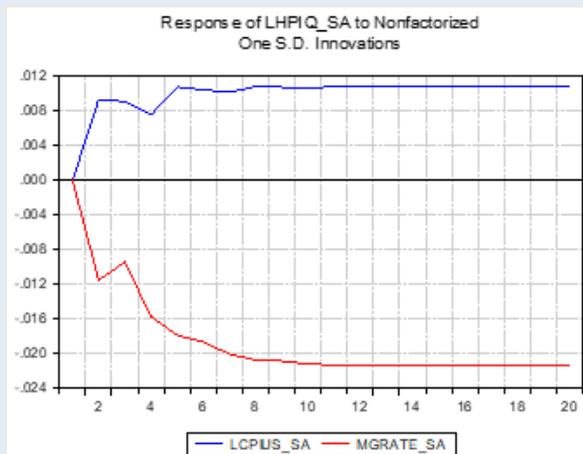
Impulse response analysis showed that for the KSA region, an increase in local consumer prices would pass-through to house prices within 3 quarters (see **Figures 3** and **4**). However, an increase in the performance of the equities market curtailed house prices within 3 quarters (suggesting that a substitution effect outweighed any potential income effect). The results also showed that higher unemployment rate led to a reduction in demand for houses in the region within 4 quarters (1-year). The impulse response function (IRF) for St. Catherine showed that higher US prices, as a proxy for imported inflation, positively impacted house prices within 2 to 8 quarters. However, mortgage rates had an adverse effect on demand and hence prices for houses between 2 and 8 quarters.

Figure 3 Impulse response function for Kingston & St. Andrew



Note: URATE_SA, LCPJA_SA and LJSE_SA represents the seasonally adjusted, unemployment rate, log consumer price index and log JSE index.

Figure 4 Impulse response function in St. Catherine



Estimates of the equilibrium Repeat Sales HPI, when seasonally adjusted and annualized, signaled that growth in house prices in both the KSA and St. Catherine regions have accelerated since 2016, following the culmination of the IMF–EFF and the beginning of the precautionary Stand–By Arrangement (see Figure 5). House prices have been largely aligned with fundamentals (equilibrium) and have featured a steeper incline since 2016. As at September 2020, the magnitude of price gaps, as a proportion of equilibrium HPI (percentage share), for KSA and St. Catherine were –5.6 per

cent and 3.8 per cent, respectively (see Figure 6). These price gaps are fairly low and do not signal any risk of a bubble in housing prices.

Figure 5 Long run trends

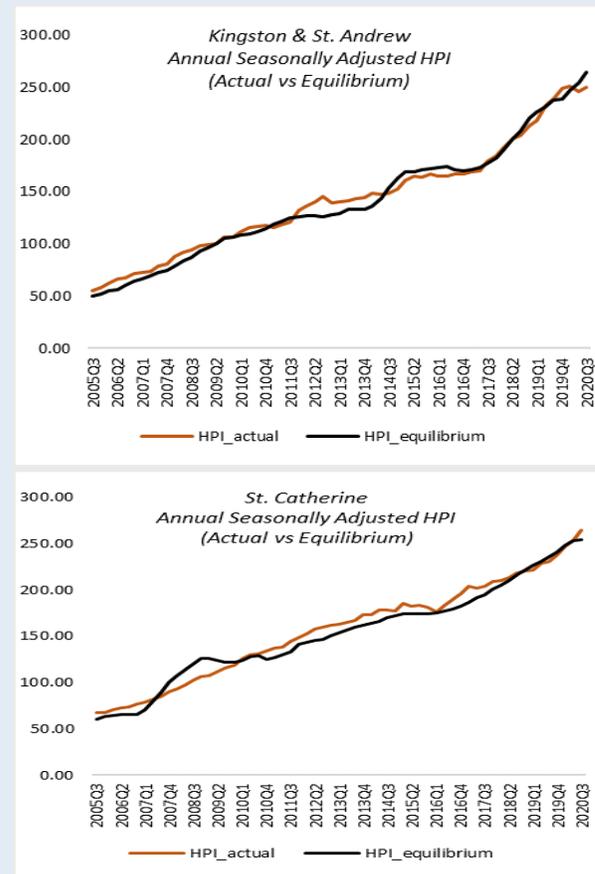
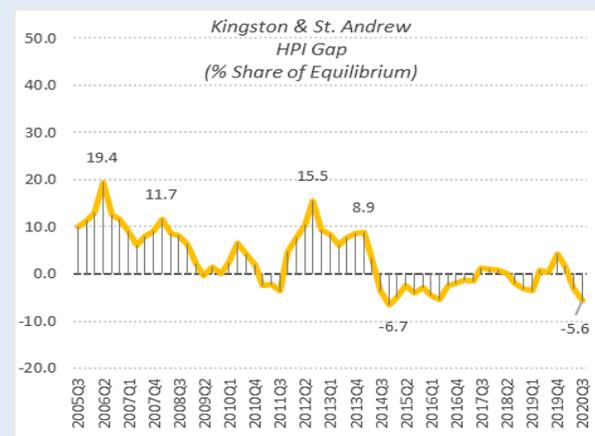
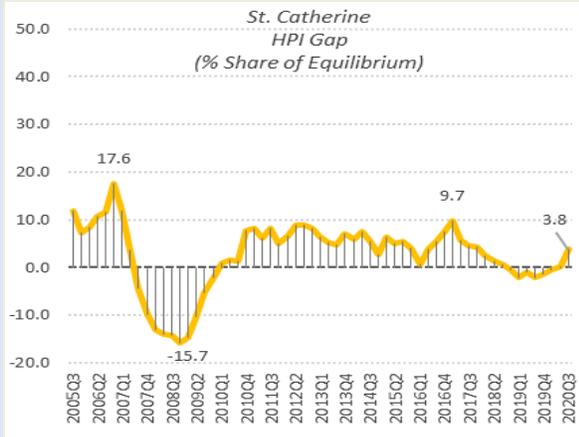
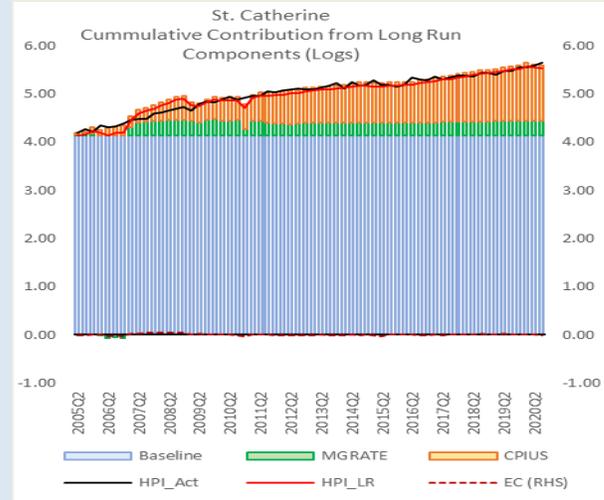


Figure 6 Long run gaps



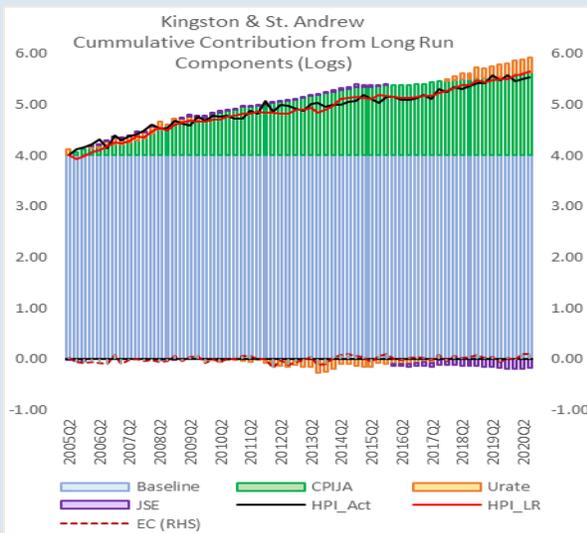


A component assessment of equilibrium prices signaled that the acceleration in house prices within KSA since 2017 was largely attributed to a decline in unemployment (see **Figure 7**). Though more moderate since 2016, local consumer prices continue to induce upward pressure on house prices. The steady climb in house prices in St. Catherine was influenced by the positive and significant relationship with increases in US prices, which is a proxy for imported inflation. The gradual decline in mortgage rates has had a miniscule effect on explaining trends in house prices in the region.



Note: HPI represent the Housing Price Index expressed in logs while the, MGRate, CPIJA, CPIUS, URATE and JSE represent the log component contribution from the Mortgage Rate, Jamaica Consumer Price Index, US Consumer Price Index, Unemployment Rate and the JSE Index.

Figure 7 Components of Equilibrium Housing Price Index



4. Conclusions

The results of the assessment confirmed that there was no evidence of a bubble in housing market prices at this time. However, given the deterioration in macroeconomic conditions, prices in the housing market are expected to soften in the near term. This is consistent with statistical evidence of a falloff in prices within KSA in light of the COVID-19 pandemic. Scenario assessment also revealed that the real estate market might be facing increased exposure to credit risk. In light of the foregoing, banks and building societies have been urged to closely monitor the potential risks that might emerge from exposure to real-estate price changes.

3.0 FINANCIAL SYSTEM DEVELOPMENTS

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

3.1 Overview

Jamaica's financial sector expanded substantially over the review year despite the adverse impact of the COVID-19 pandemic on economic activity. However, there was deterioration in the DTI sector's profitability and asset quality. Nonetheless, DTIs continued to maintain adequate levels of capital and liquidity during 2020.

Non-deposit-taking financial institutions (NDTFIs) recorded marginal increase in total asset base with contributions from almost all the sub-sectors. Life insurance companies, general insurance companies and securities' dealers were the largest contributors to the overall increase in NDTFIs' asset base. Securities dealers' on balance sheet assets increased over the review period. However, on and off-balance sheet funds under management declined.

Securities dealers' capital adequacy ratio was relatively unchanged for the review period. Of note, there was a continued slow pace of dollarization within the securities dealers' sub-sector. Securities dealers' profitability indicators reflected mixed results over the review period.

The asset base of both the life and general insurance sub-sectors recorded increases during the review period. Government securities continued to account for the largest share of life insurance assets. Insurance penetration, which measures the importance of insurance activity relative to the size of the economy, remained low during the review period.

The claims ratio for insurance companies increased during the review period. Profitability indicators generally improved in the insurance sub-sector over the review period. The insurance sub-sector's capital adequacy and solvency remained at adequate levels. The reinsurance retention ratios for life and general insurance companies showed mixed results.

Figure 3.1 Jamaica's financial intermediation (assets of financial corporations as % of GDP)

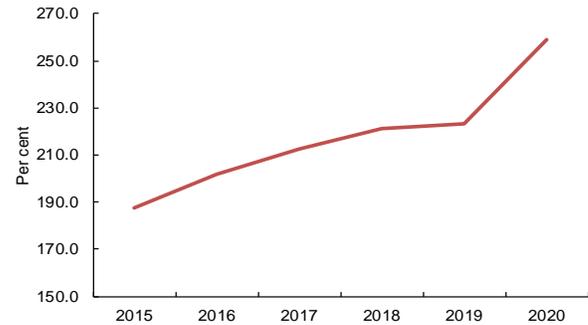


Figure 3.2 Distribution of financial system assets¹

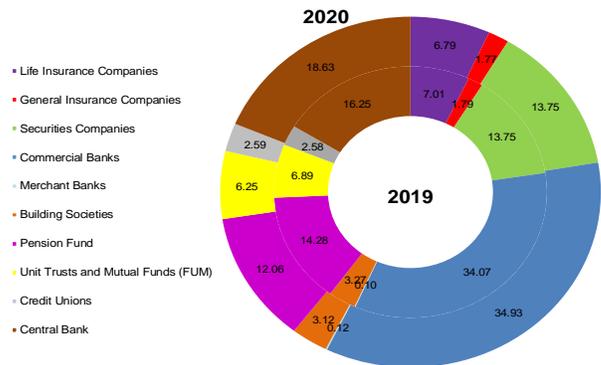
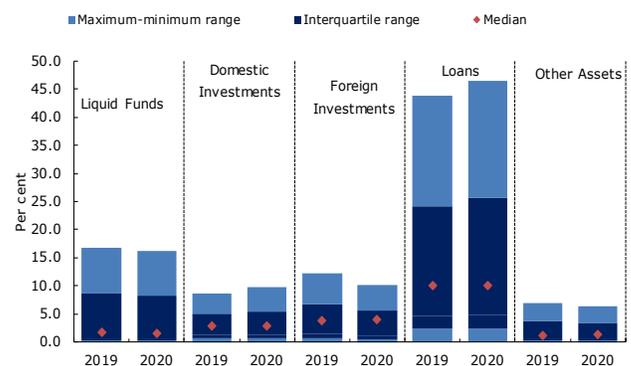


Figure 3.3 Distribution of major asset categories as a share of total DTIs' assets



¹ Assets are defined as total balance sheet assets.

Figure 3.4 Major components of DTIs' aggregate balance sheet

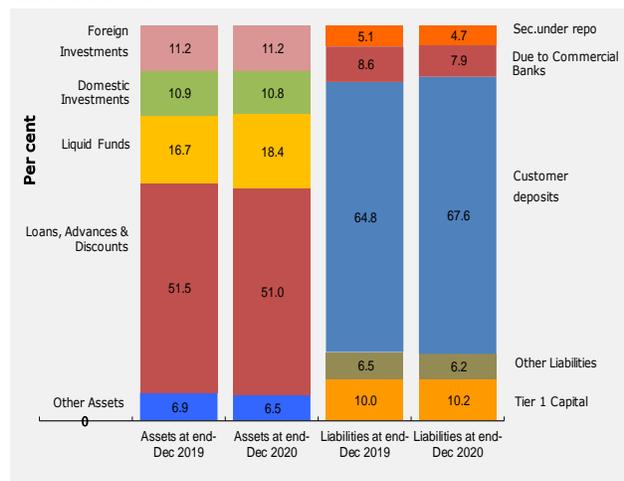


Figure 3.5 Concentration of DTIs' loan portfolio to private sector

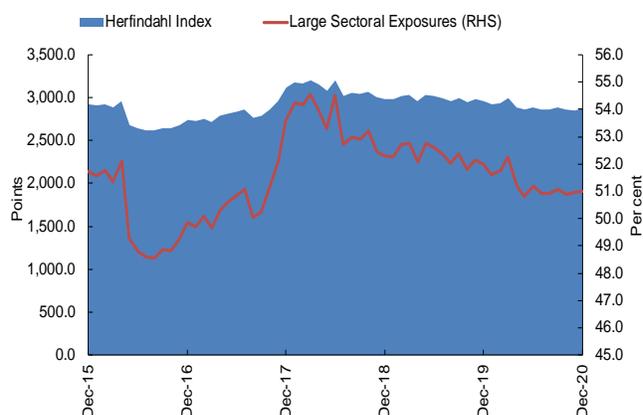
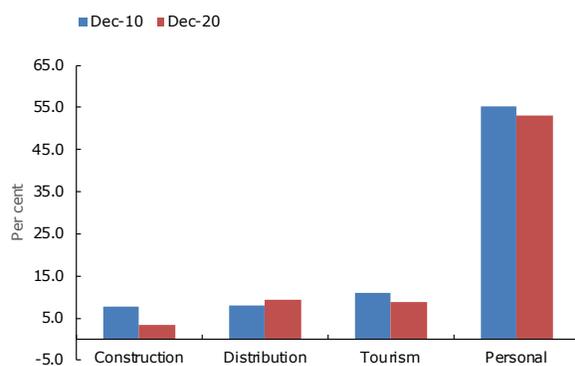


Figure 3.6 Share of private sector credit by top three DTIs



3.2 The financial system

There was a major improvement in the depth of financial intermediation in Jamaica, as the ratio of total financial institutions' assets to GDP increased significantly, relative to the previous period (see **Figure 3.1**).² The ratio grew to 259.1 per cent at end-2020 from 223.1 per cent at end-2019. This outturn reflected a stronger decline in GDP relative to the growth in financial system assets at end-2020.

3.3 Deposit-taking institutions

3.3.1 Market share of deposit-taking institutions

All DTI sub-sectors recorded growth in their market share, as measured by each sub-sector's assets as a percentage of overall financial system assets. Most notably, commercial banks' market share grew by 4.4 percentage points to 39.6 per cent of total financial system assets at end-2020, compared to 35.2 per cent for the previous period ending 2019. Furthermore, commercial banks' assets to total DTI assets increased marginally to 91.5 per cent at end-2020, from 91.0 per cent at end-2019. As such, commercial banks remained the dominant sub-sector within the DTI sector. Additionally, building societies recorded growth in their market share by 0.2 percentage points to 3.5 per cent (see **Figure 3.2**).³

3.3.2 Deposit-taking institutions' balance sheet position

All DTI sub-sectors recorded growth in assets for 2020. In particular, DTIs' total assets grew by 19.7 per cent to \$2,023.8 billion at end 2020, relative to 10.6 per cent at end 2019. This acceleration in asset growth was primarily driven by an increase in DTIs' holdings of *Liquid Funds* (see **Figures 3.3** and **3.4**). Notwithstanding,

² Total Financial Institutions assets includes the assets of commercial banks, building societies, FIA licensees, securities dealers, insurance companies and the Bank of Jamaica (BOJ)

³ Credit unions were not included in the analysis for the review period.

Loans, Advances and Discounts continued to account for the largest share of DTIs' total assets. The main components of this portfolio comprised domestic currency loans which grew by 11.4 per cent. Additionally, foreign currency loans increased by 8.7 per cent for the review period. Similarly, DTIs' domestic currency investment holdings increased by 10.5 per cent to \$218.8 billion, and DTIs' foreign currency investments increased by 12.0 per cent to \$227.0 billion.

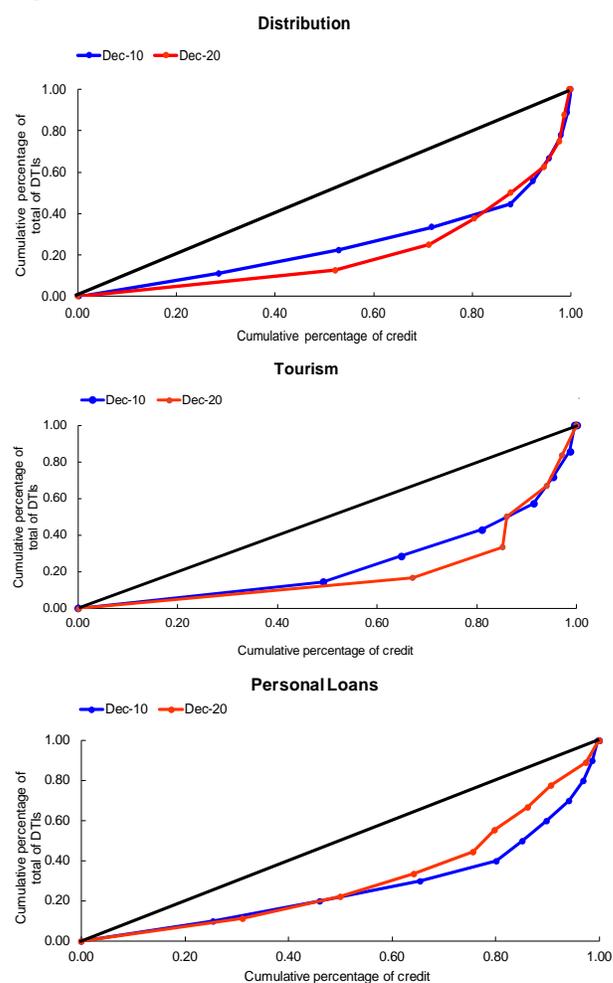
At the same time, the ratio of DTIs' net open position (NOP) to capital widened to a short position of 26.0 per cent at-end 2020 from a short position of 10.8 per cent at end-2019.⁴ During the year, DTIs generally held short positions in anticipation of possible liquidity needs. Of note, for the December 2020 quarter, DTIs' foreign currency assets decreased at a faster pace relative to foreign liabilities.

The sectoral concentration of DTIs' loans to the private sector, as measured by the Herfindahl-Hirschman Index (HHI), decreased by 3.0 per cent to 2,876.5 at end-2020, relative to end-2019 (see **Figure 3.5**).⁵ Moreover, the domestic *Household* sector (personal loans) remained the largest credit exposure for DTIs.⁶ DTIs' exposure to the household sector decreased by 1.9 percentage points to 51.0 per cent at end-2020. DTIs other main exposures for the review period, were to *Overseas* residents and *Distribution* (both 7.9 per cent), *Tourism* (6.3 per cent) and *Professional Services* (6.2 per cent) (see **Figure 3.6** and **Table 3.1**).

Table 3.1 Concentration of DTIs' loan portfolio⁷

Per cent	2016	2017	2018	2019	2020
AGRICULTURE & FISHING					
CONSTRUCTION & LAND DEV.					
DISTRIBUTION					
ELECTRICITY					
ENTERTAINMENT					
FINANCIAL INSTITUTIONS					
MANUFACTURING					
MINING, QUARRYING & PROC.					
PERSONAL NON BUS. LOANS TO IND					
PROFESSIONAL & OTHER SERVICES					
OVERSEAS RESIDENTS					
TOURISM					
TRANSPORT, STORAGE & COMM.					
PUBLIC SECTOR					

Figure 3.7 Lorenz curve distribution of credit for DTIs



⁴ The average quarterly NOP to capital for 2020 declined to a short position of 19.7 per cent relative to a short position of 5.6 per cent for 2019.

⁵ The Herfindahl-Hirschman Index (HHI) is calculated by squaring the loan share of each sub-sector within the private sector loan market and then summing the resulting numbers. The HHI index can range from close to zero to 10 000.

⁶ "Household" is used to represent the "Personal Loans" line item which include mortgages to households.

⁷ With respect to Table 3.1, darker areas indicate more concentration.

Figure 3.8 NPLs in the DTI sector

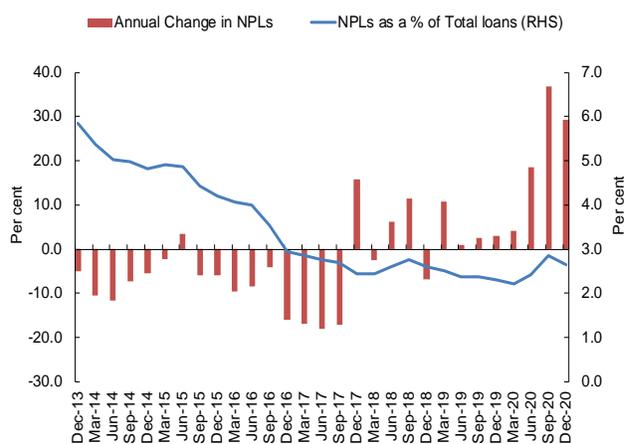


Figure 3.9 Loan loss provisioning rate and NPL coverage for DTIs

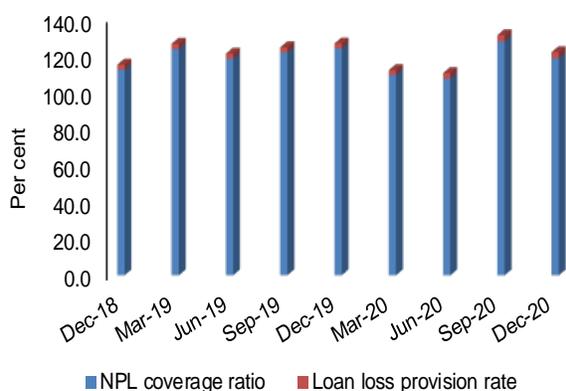
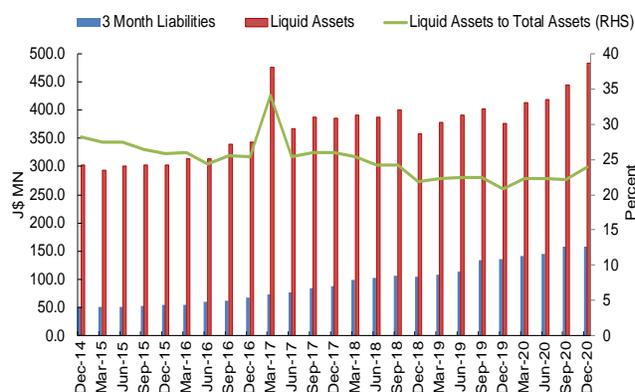


Figure 3.10 Liquidity conditions in the DTI sector



A Lorenz curve analysis showed that DTIs' credit portfolio continued to reflect high concentration levels as at end-2020.⁸ More specifically, three of the eleven DTIs continued to account for over 60.0 per cent of loans extended to the private sector. Moreover, the share of private sector credit for those DTIs that channeled credit to the three main economic sectors during the review period increased by 3.5 percentage points to 63.4 per cent of total credit to the private sector. This was primarily due to an increase in credit to the distribution sector over the 10-year period. Notably, larger institutions reduced their exposure to the tourism sector at end-2020 compared to end-2010. This is evidenced through the sharp contraction in the Lorenz curve for the tourism sector. However, the share of private sector credit for these three DTIs to total credit to the private sector, decreased by 0.9 percentage points, from 64.3 per cent in the previous period ending 2019.

In addition, the distribution showed that the concentration of credit to the private sector was channeled to three main economic sectors (*Household, Distribution and Tourism*). It is also noted that the share of private sector credit to households by most DTIs increased over the review period ending 2020 (see **Figure 3.7**).⁹

Against the backdrop of the COVID-19 pandemic, asset quality for DTIs deteriorated during the review period. In particular, the ratio of non-performing loans (NPLs) to total loans, increased by 0.6 percentage points to 2.8 per cent at end-2020, relative to the same period last year. Noteworthy also, there was an increase in the dollar value of NPLs by 41.9 per cent to 29.3 billion for the review period, relative to a smaller increase of 4.1 per cent to 20.7 billion for 2019 (see **Figure 3.8**). In contrast, the NPL coverage ratio decreased to 118.2 per cent at

⁸ The Lorenz curves show a sectoral distribution of credit to the private sector, and serves as an indication of the degree of credit concentration. The straight diagonal line represents equal distribution of credit by each DTI, and the extent to which the Lorenz curve deviates from (or drops below) the line of equality, indicates the degree of inequality in the distribution of credit.

⁹ Lorenz curve analysis subsequent to end-2010 is significant given the impact of the global financial crisis and the Jamaica Debt Exchange (JDX) on DTIs' loan portfolio.

end-2020 in comparison to 123.5 per cent at end-2019 (see **Figure 3.9**).¹⁰ This result was due to weaker growth in DTI provisions for the review period, relative to end-2019.

Moreover, the loan loss provisioning rate, as measured by the ratio of loan loss provisions to total loans, increased to 3.9 per cent at end-2020 relative to 2.8 per cent at end-2019.¹¹ The increase in the ratio was due to stronger growth in DTIs' total provisions relative to the growth in total loans.

DTIs continued to maintain adequate liquidity levels in compliance with the minimum regulatory requirements.¹² In particular, liquidity conditions as measured by the liquid assets ratio improved to 23.8 per cent at end-2020 compared to 20.7 for the previous period ending 2019.¹³ The increase in the liquid assets ratio reflected stronger growth in DTIs' liquid assets relative to the growth in DTIs' total assets (see **Figure 3.10**).

In addition, total liabilities for DTIs increased during the review period ending 2020, with funding from deposits remaining the major source of asset financing for DTIs. DTIs' total deposits increased by 16.8 per cent to \$1,366.4 billion and represented 78.3 per cent of total liabilities at end-2020 relative to 76.2 per cent for the same period last year. In contrast, the loans to deposit ratio, which is a measure of

Figure 3.11 Distribution of capital adequacy ratio

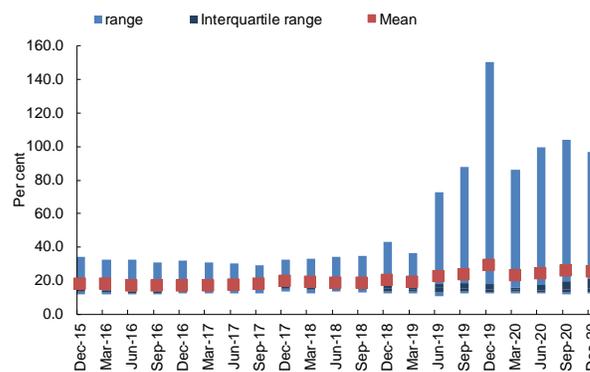


Figure 3.12 Operating profit and impairment losses for DTIs

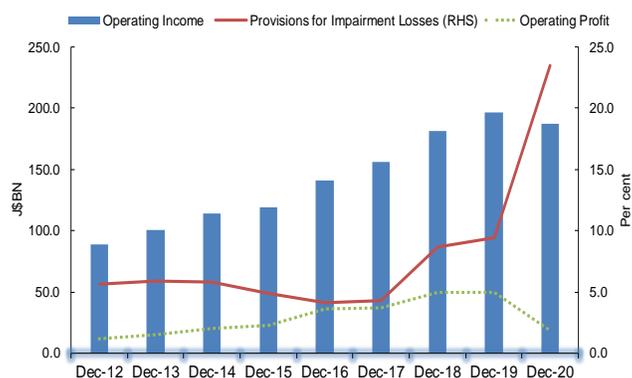
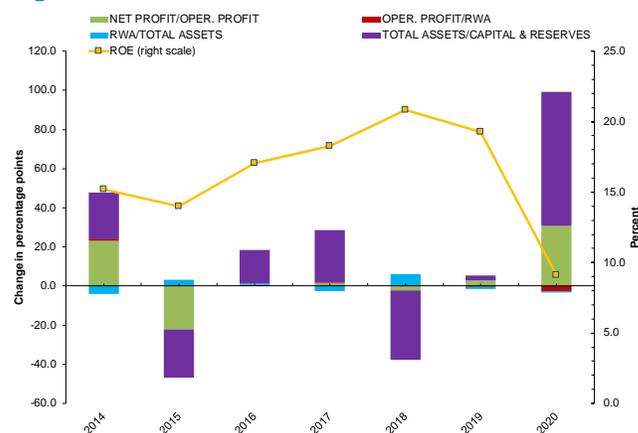


Figure 3.13 Decomposition of DTIs' ROE¹⁴



¹⁰ NPL coverage ratio measures a bank's ability to absorb potential losses from its non-performing loans. It is calculated as provisions for impairment under the International Financial Reporting Standards (IFRS) plus prudential provisions for expected losses based on regulatory criteria as a ratio to NPLs.

¹¹ Loan loss provisions represent the net new allowances that DTIs make in the period against bad or impaired loans. This is done based on their judgement as to the likelihood of losses. Under the International Financial Reporting Standards, it is calculated as provisions of impairment plus prudential provisions as a percentage of total loans.

¹² DTIs are required to hold cash reserves (CRR) at Bank of Jamaica amounting to 5.0 per cent and 13.0 per cent for domestic and foreign assets, respectively. The cash reserve requirement (CRR) for building societies is 1.0 per cent for both domestic and foreign assets. The liquid assets requirements for domestic and foreign assets are 19.0 per cent and 27.0 per cent, respectively. For building societies, the liquid assets requirements for both domestic and foreign assets are 5.0 per cent.

¹³ The Liquid assets ratio (LAR) is calculated as the ratio of liquid assets to total assets.

¹⁴ The ROE level is presented on the right-hand scale in percentage; the changes of factors (components of ROE) are presented on the left-hand scale.

Figure 3.14 Distribution of DTIs' ROA

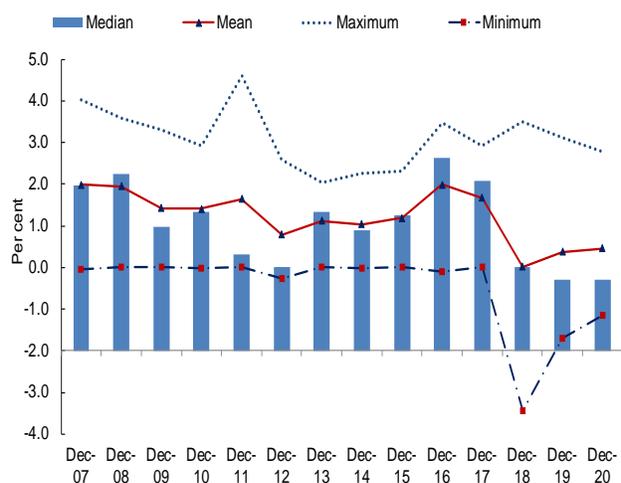
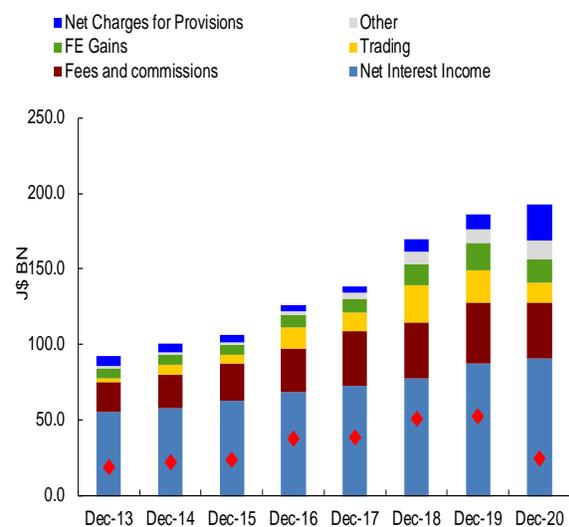


Figure 3.15 DTIs' sources of revenue, total provisions and net profit



financial intermediation, declined by 4.0 percentage points to 75.6 per cent as at end-2020. This result also reflects a decrease in DTIs exposure to liquidity risk.

The average capital adequacy ratio (CAR) for DTIs deteriorated to 25.3 per cent as at end-2020, from 29.0 per cent for the previous period ending 2019 (see **Figure 3.11**). In contrast, there was an improvement in the quality of regulatory capital, measured by the ratio of Tier 1 capital to total regulatory capital. This ratio increased by

2.1 percentage points to 94.1 per cent for the review period, relative to 92.0 per cent for the corresponding period last year. The ratio of retained earnings to capital, however, declined by 3.8 percentage points to 29.9 per cent as at end-2020 relative to 33.6 per cent as at end-2019. Additionally, the ratio of Tier 1 capital to risk weighted assets grew to 17.8 per cent at end-2020, relative to 15.3 per cent for the same period last year.

3.3.3 Deposit-taking institutions' earnings and profitability

Against the background of the COVID-19 pandemic, DTIs' net profits declined to \$25.0 billion for 2020 and represented less than half of the sector's net profits for 2019. Moreover, DTIs' total operating income of \$187.5 billion was 4.2 per cent lower than that of the same period last year. Of note, total operating expenses increased to \$167.1 billion from \$148.1 billion for 2019. Consequently, for the review period, operating profits declined by \$27.9 billion to \$22.8 billion, while provisions for impairment losses grew by \$11.5 billion to \$22.3 billion as at end-2020.

Against the background of declining net profits, the DTI sector also realized a decline in return on equity (ROE). The sector's ROE declined by 10.2 percentage points to 9.1 per cent for 2020 relative to 19.3 per cent for 2019. This decline was primarily driven by a lower operating margin, which is measured as the ratio of operating profit to risk-weighted assets (RWAs) (see **Figure 3.12**).

A decomposition of the ROE showed decreases in the operating margin and the risk weighted assets density ratio. These results were due to a decline in operating profits, accelerated asset growth and decline in capital and reserves (see **Figure 3.13**).

Similarly, DTIs' return on assets (ROA) declined to 1.2 per cent for 2020, relative to 2.9 per cent for 2019. The median ROA remained relatively unchanged at -0.3 per cent for 2020, similar to

2019 (see **Figure 3.14**). This result reflected declines in net income from trading, foreign exchange gains, as well as fees and commissions. However, net interest income for DTIs increased marginally by 3.4 per cent for the review period (see **Figure 3.15**). Concurrently, interest expenses decreased by 4.8 per cent, driven primarily by a reduction in expenses on demand deposits and borrowings. Nonetheless, DTIs' net interest margin, which is measured by the ratio of net interest income to average earning assets, also decreased marginally to 6.6 per cent at end-2020, from 7.3 per cent at end-2019.

3.4 Non-deposit-taking financial institutions (NDTFI)

3.4.1 Non-deposit-taking financial institutions' market share and balance sheet position

Non-deposit-taking financial institutions recorded a marginal increase in their total asset base with contributions from almost all the sub-sectors. In the context of the general decline in asset prices due to the COVID-19 pandemic, the asset base of the NDTFI sector increased by 2.0 per cent to \$2 196.7 billion as at end-September 2020, relative to growth of 12.7 per cent for the year ended-September 2019.¹⁵ This expansion in the sector's total assets was reflected in all the sub-sectors with the exception of the pension funds. For the year ended September 2020, the assets of life insurance, general insurance and collective investment schemes (CIS) grew by 6.2 per cent, 8.2 per cent and 0.5 per cent respectively. Similarly, the asset base of thirty core securities dealers grew by 9.7 per cent. However, the total assets of pension funds decreased by 7.3 per cent.

Life insurance companies, general insurance companies and securities' dealers recorded the highest market shares within the NDTFI sector. For the year ended-September 2020, the market

Figure 3.16 Major components of securities dealers' funds under management (FUM) assets

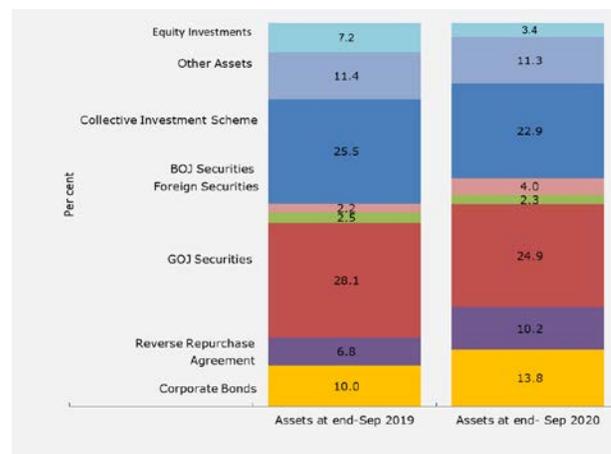


Figure 3.17 Securities dealers' regulatory capital, capital adequacy and primary ratios

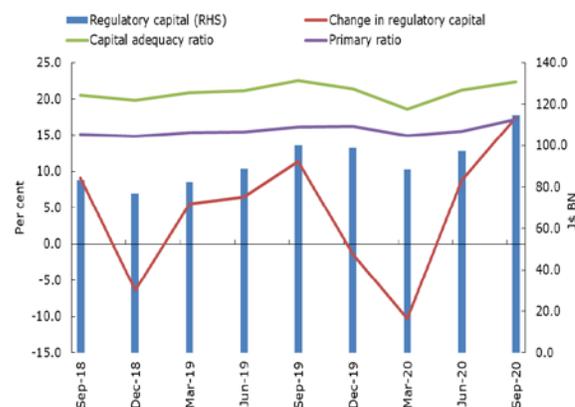
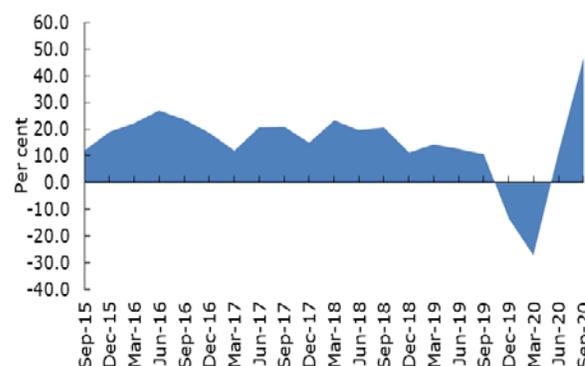


Figure 3.18 Foreign Currency Net Open Position (NOP) to Capital (exposure to foreign exchange risk)



¹⁵ NDTFIs consist of securities dealers, pension funds, CIS, life insurance and general insurance companies.

Figure 3.19 Securities Dealers’ Return on Asset (ROA) and Return on Equities (ROE)

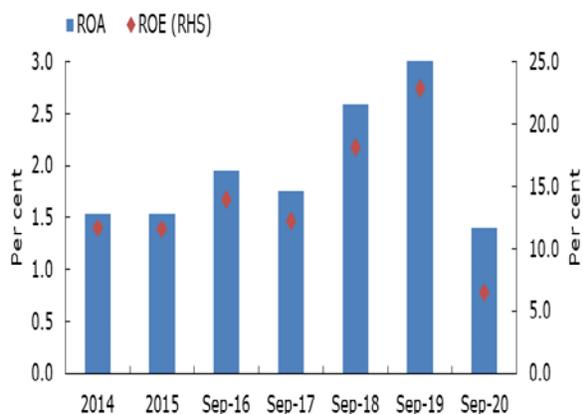


Figure 3.20 Distribution of assets of life insurance companies

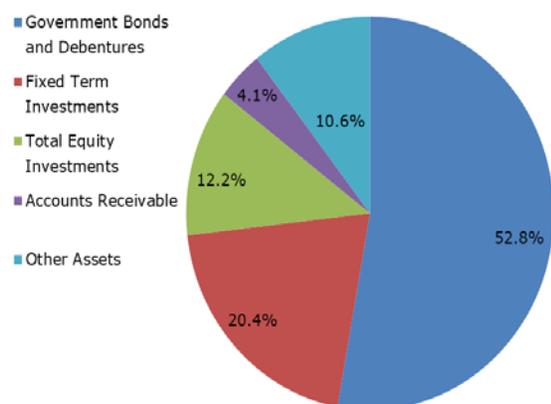
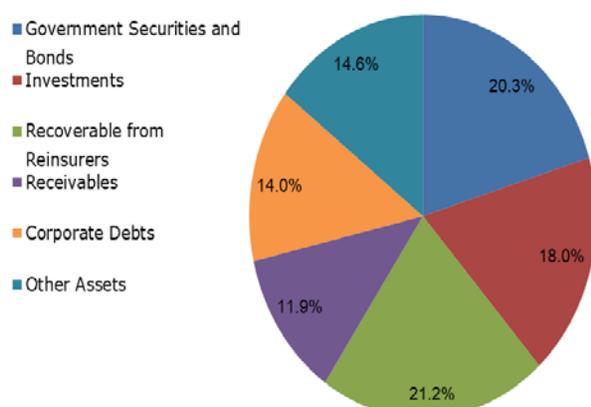


Figure 3.21 Distribution of assets of general insurance companies



share of securities dealers, pension funds and life insurance companies accounted for 33.2 per cent, 29.1 per cent and 16.4 per cent of NDTFI’s total assets relative to 30.9 per cent, 32.1 per cent and 15.7 per cent respectively, for the corresponding period of 2019. The market share of the pension funds and CIS’ sub-sector as a proportion of of NDTFI’s total asset was lower at September 2020 relative to the end of the previous review period.

3.4.2 Securities dealers

Securities dealers on balance sheet assets increased over the review period. However, on and off-balance sheet funds under management declined. The asset base of securities dealers was \$728.9 billion at end-September 2020 relative to \$664.7 billion at end-September 2019. However, securities dealers’ on and off-balance sheet funds under management (FUM) decreased by 5.1 per cent to \$1 285.7 billion at end-September 2020, which largely reflected a decline in CIS (see **Figure 3.16**).¹⁶ The decline in on and off-balance sheet FUM was influenced by a shift to Government of Jamaica Securities and Equity Investments at Market Value by 15.9 per cent and 55.4 per cent respectively.

Securities dealers’ capital adequacy ratio decreased by 0.1 percentage point to 22.4 per cent. Securities dealers’ regulatory capital grew by 16.6 per cent to \$114.7 billion at end-September 2020.¹⁷ Concurrently, securities dealers’ risk-weighted assets (RWA) increased by 15.2 per cent to \$512.7 billion at end-September 2020 relative to end-September 2019. These changes lead to an increase of 1.4 percentage points to 17.2 per cent in the primary ratio as measured by the ratio of regulatory capital to total assets (see **Figure 3.17**).

¹⁶ CIS includes pooled funds and other assets, where other assets consist of derivatives, interest receivables, other receivables and other investments such as real estate.

¹⁷ For the remainder of the chapter, the analysis is based on a representative sample of twelve securities dealers that comprise 91.5 per cent of the sector.

Securities dealers' exposure to foreign exchange risk, as measured by the foreign currency NOP to capital ratio, increased by 35.9 percentage points to 46.9 per cent at end-September 2020 (see **Figure 3.18**). In addition, for the review period, dollarization within the securities dealers' sub-sector increased. Specifically, the ratio of foreign currency investments to total investments increased by 3.6 percentage points to 55.8 per cent at end-September 2020. This compares to a decrease of 4.2 percentage points for the previous review period.

Securities dealers' profitability indicators reflected mixed results over the review period. For the year ended September 2020, the securities dealers' ROA increased to 4.9 per cent from 4.0 per cent at the end of the previous period. This was due to a faster growth in profits relative to the expansion in assets. However, the sector's ROE decreased marginally to 22.4 per cent from 22.8 per cent (see **Figure 3.19**). This decline was due to a faster growth in equities relative to the increase in profit. In addition, leverage as measured by the total liabilities, to total assets ratio, declined to 77.4 per cent as at end-September 2020 from to 79.3 per cent at the end of September 2019.

3.4.3 Insurance companies

The insurance sector's asset base increased marginally over the review period. The insurance sector's asset base grew by 6.7 per cent to \$454 billion at end-September 2020. Of note, life insurance companies accounted for 79.3 per cent of the insurance sector's total assets relative to 79.8 per cent for the previous corresponding period in 2019. Furthermore, within the life insurance sub-sector, the two largest life insurance companies accounted for 82.5 per cent of total assets at end-September 2020, relative to 65.6 per cent at end-September 2019. As it relates to general insurance, the two largest companies accounted for approximately 36.7 per cent of the sub-sector's asset base, relative to 50.9 per cent at end-September 2019.

Figure 3.22 Insurance Penetration

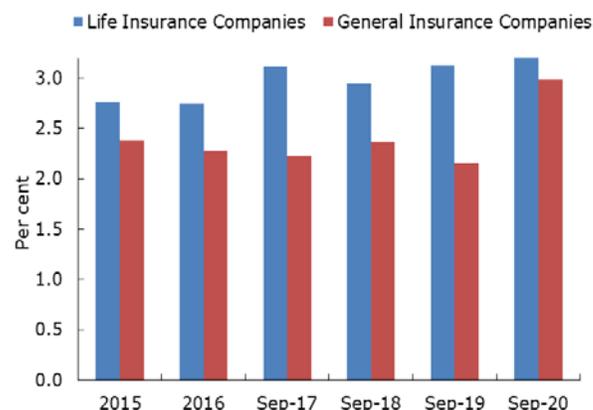


Figure 3.23 Premium income and growth of insurance sector

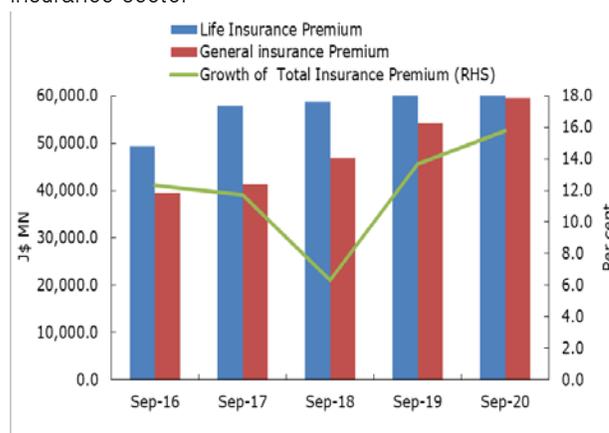


Figure 3.24 Earned premium, claims incurred and claims ratio of insurance sector

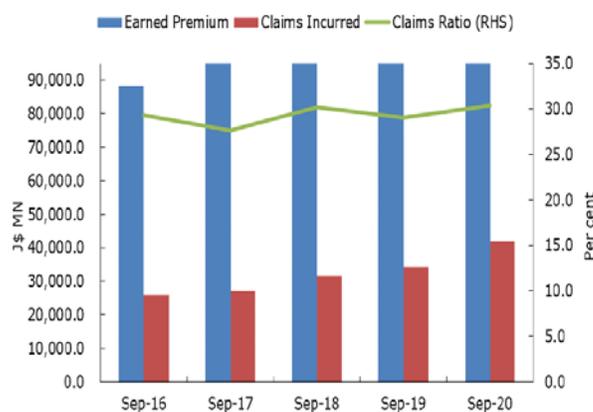


Figure 3.25 Growth in profit before tax for insurance companies

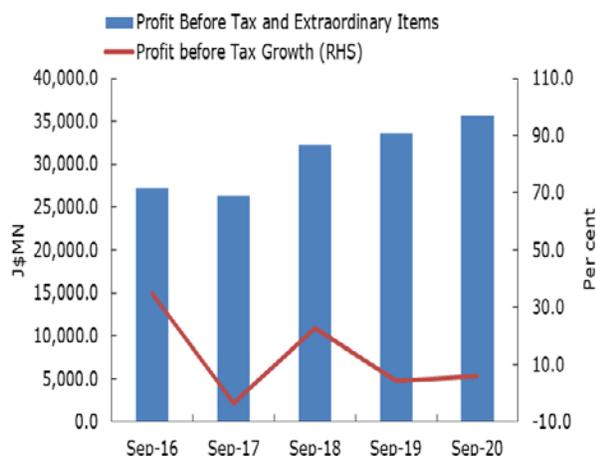


Figure 3.26 Total income (GWP + investment income) of the insurance sector

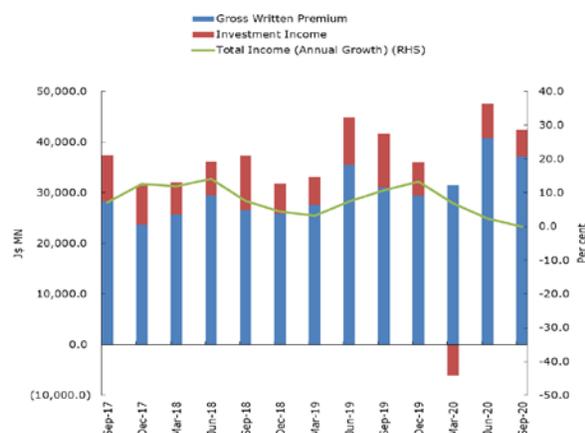


Figure 3.27 Distribution of the solvency ratio of insurance companies



Both the life and general insurance sub-sectors recorded increases in asset base during the review period. The asset base of life insurance and general insurance companies increased by 6.3 percent to \$359.9 billion and 8.2 per cent to \$93.8 billion respectively for the review period. The growth in assets of life insurance companies was largely influenced by increases in Other Assets and Real Estate by 128.5 per cent and 87.5 per cent respectively. For general insurance companies, the growth in the asset base reflected a 227.9 per cent increase in Investment Subsidiaries.

Government securities continued to account for the largest share of life insurance assets. Government securities accounted for 52.8 per cent of life insurance total assets at end-September 2020 relative to 54.4 per cent at end-September 2019 (see **Figures 3.20**). On the other hand, Recoverable from Reinsurers accounted for the largest share (21.2 per cent) of general insurance total assets. Government securities constituted the second highest share of general insurance total assets (20.3 per cent) at end-September 2020 (see **Figure 3.21**).

Insurance penetration, which measures the importance of insurance activity relative to the size of the economy, remained low during the review period. Insurance penetration, as measured by the ratio of gross premium to GDP, increased to 4.0 per cent and 3.0 per cent for life insurance and general insurance companies, respectively, at end-September 2020. This compares to ratios of 3.1 per cent and 2.2 per cent, respectively at the end of the previous review period (see **Figure 3.22**).¹⁸ Of note, insurance total gross premiums increased by 15.8 per cent to \$138.9 billion at end-September 2020 relative to the previous period (see **Figure 3.23**). Nonetheless, insurance density, measured

¹⁸ Based on latest available data, Jamaica's insurance sector penetration exceeded the average of 3.1 per cent average for Latin America and Caribbean countries in 2016. However, the trend over the years has lagged behind the aggregate insurance penetration of 8.0 per cent in developed markets. See, Gonzalez, R., "Insurance penetration in Latin America and the Caribbean", The Actuary, 2018, <http://www.theactuary.com/features/2018/07/insurance-penetration-in-latin-america-and-the-caribbean/>

as the ratio of average gross premiums for the general and life insurance sub-sectors to total population, remained at 0.002 per cent at end-September 2020.

The claims ratio for insurance companies increased to 30.4 per cent during the review period. The claims ratio, which is the ratio of claims incurred to earned premiums for insurance sector, was 30.4 per cent at end-September 2020 which was higher than the ratio of 29.1 per cent at end-September 2019 and the five-year average of 29.3 per cent (see Figure 3.24).^{19,20} This outturn in the ratio was influenced by a faster growth in claims relative to premiums earned.²¹

The insurance sector's profitability increased significantly over the review period. The insurance sector's profit before tax grew by 3.4 per cent to \$34.6 billion as at end-September 2020 relative to \$33.6 billion at end-September 2019 (see Figure 3.25).²² The improvement in the insurance sector's profitability was largely due to an increase of 19.3 per cent in the total income earned for the year ended September 2020 (see Figure 3.26). The growth in total income was largely influenced by the increase in gross written premium.

The insurance sector's capital adequacy and solvency remained at adequate levels. All life insurance companies exceeded the Minimum Continuing Capital and Surplus Requirements (MCCSR) ratio prudential benchmark of 150.0

Figure 3.28 Capitalization of the insurance sector

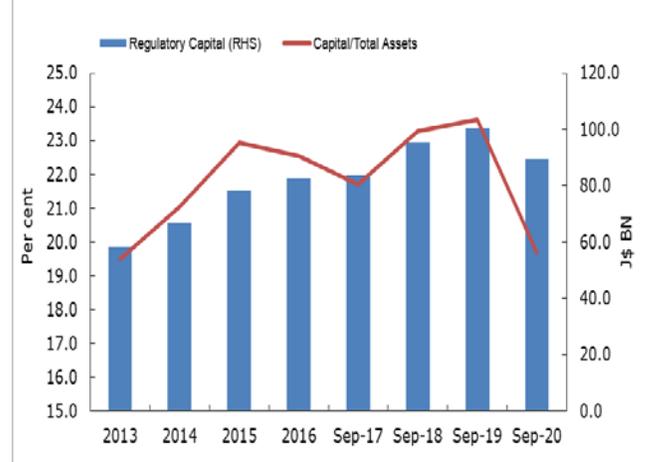


Figure 3.29 Retention ratio of life insurance companies

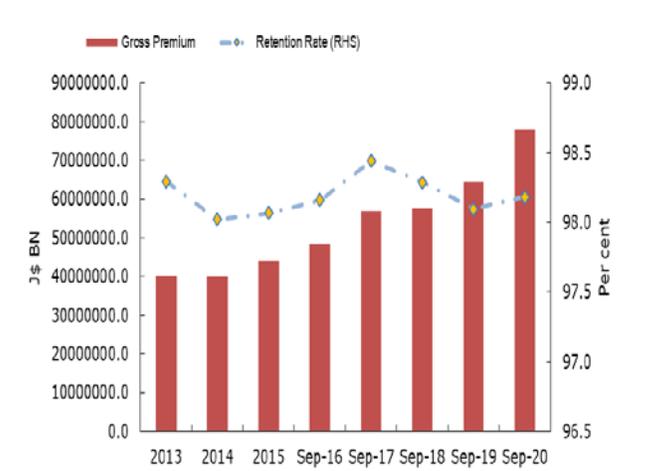
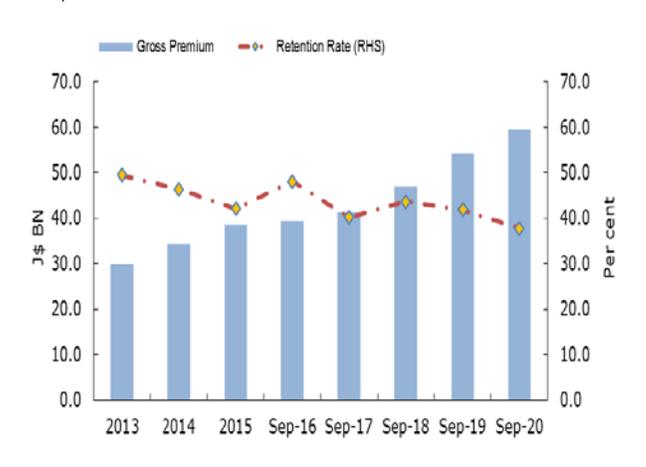


Figure 3.30 Retention ratio general insurance companies



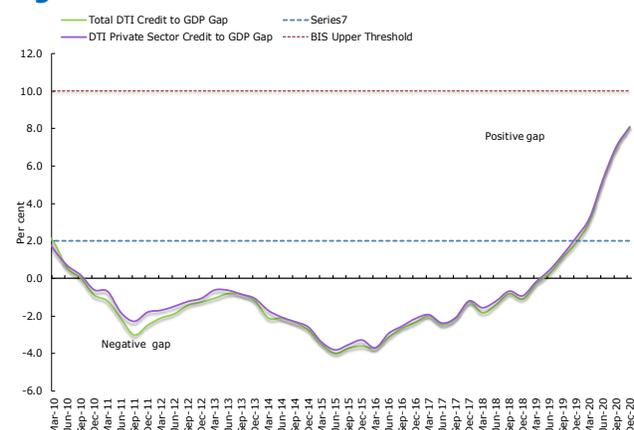
¹⁹ Earned premium is the pro-rated portion of the policy holder's prepaid premium that applies to the expired portion of the policy, which now belongs to the insurer.

²⁰ The breakdown of data required for the calculation of this ratio is not available for life insurance companies.

²¹ Faster growth in claims may have been due to the increase in health claims, increased motor vehicle claims and the surrender of life investments as a result of the COVID-19 pandemic. While the slower growth in premiums earned may have been due to the general fall out in income.

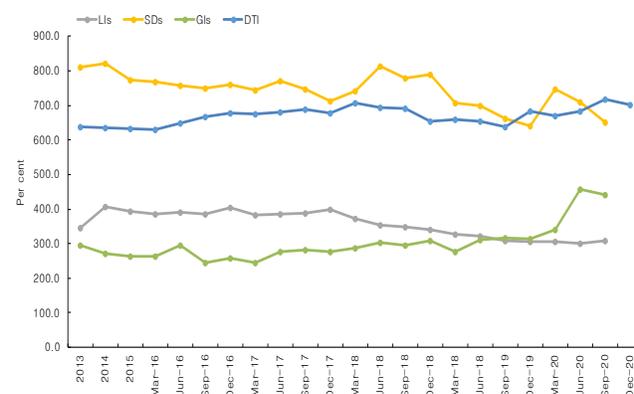
²² Profit before tax was calculated using the moving sum of the four (4) quarters to September 2020 for both insurance sub-sectors.

Figure 3.31 Credit-to-GDP Gap



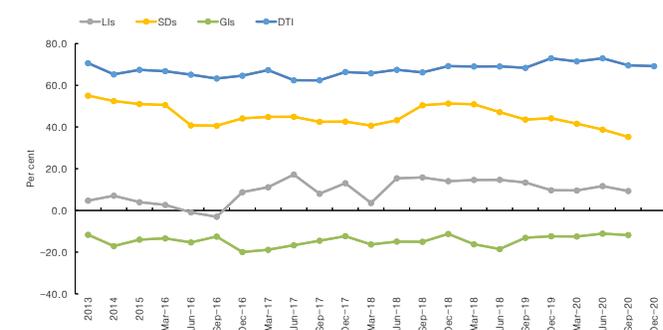
Note: Credit-to-GDP gaps were estimated by applying the one-sided Hodrick Prescott (HP) filter to quarterly data spanning the period 2000 to 2015 for all DTIs.

Figure 3.32 Leverage metric – DTIs, securities dealers and insurance companies



Note: Leverage is calculated as total financial assets to equity. DTI values prior to September 2016 are calculated as the average of the ratios of each DTI sub-sector. After September 2016, sector balances are first aggregated and a single ratio then computed. An increase in this indicator signals higher risks.

Figure 3.33 Maturity transformation (long-term) – DTIs, securities dealers and insurance companies



Note: Maturity transformation is calculated as long-term assets less long-term liabilities and nonredeemable equity divided by total financial assets. An increase in this indicator signals higher risks.

per cent.²³ In particular, the MCCR was 207.2 per cent for the sector. Similarly, all general insurance companies, except two, exceeded the Minimum Capital Test (MCT) prudential benchmark of 250.0 per cent.²⁴ The MCT ratio for the general insurance sub-sector was 263.1 per cent at end September 2020 (see **Figure 3.27**). However, there was a decline in the ratio of capital to total assets to 19.7 per cent at end-September 2020 from 23.6 per cent at end-September 2019 (see **Figure 3.28**).

The reinsurance retention ratios for life and general insurance companies showed mixed results. The reinsurance retention ratio, as measured by net premium written to gross direct premium written, for life insurance companies increased marginally to 98.2 per cent at end-September 2020 relative to 98.1 per cent at end-September 2019. Meanwhile, the general insurance companies' reinsurance retention ratio decreased to 39.9 per cent at end-September 2020 from 41.9 per cent at the end of the previous review period (see **Figures 3.29** and **3.30**).²⁵

3.5 Measures of financial cycle

3.5.1 Financial sector leverage

There was a slowdown in DTI credit growth for the review period. Growth in DTIs' total credit increased by 10.1 per cent for the year ended December 2020, relative to 16.4 per cent for the previous year. Meanwhile, expansion in private

²³ The Minimum Continuing Capital and Surplus Requirements (MCCR) measures an insurer's capital adequacy to meet its obligations to policyholders.

²⁴ The MCT Prescribed Capital Required ("PCR") assesses the riskiness of assets and policy liabilities and compares capital available to capital required. It was initially set at 200.0 per cent in 2011 and was increased to 225.0 per cent in the first quarter of 2012 and increased to 250.0 per cent in 2013. Except for annual filing of the MCT, the figures are preliminary.

²⁵ Reinsurance retention ratio measures the amount of risk being absorbed by an insurer rather than passing it on to a reinsurer. Measured as the ratio of net premiums written to gross premiums, the ratio captures the net amount of risk which the reinsurer keeps for his own account. The lower the ratio, the more the company is able to avoid financial distress following a large claim.

sector credit slowed by 10.4 per cent from 17.8 per cent for 2019.²⁶ This growth in credit, albeit slower, reflected continued expansion in domestic credit, primarily influenced by BOJ maintaining its accommodative monetary policy. Although the stronger credit growth was not deemed to be excessive, the credit-to-GDP gap increased to 8.1 per cent, largely due to the strong contraction in GDP during the review period (see **Figure 3.31**). Loan quality ratios continued to be low despite an increase in the non-performing loans to total loans ratio to 2.9 per cent at end-2020 from 2.2 per cent at end-2019.

The leverage metrics for DTIs increased for 2020 relative to 2019. This was attributable to stronger growth in total financial assets and off-balance sheet exposures relative to the increase in equity (see **Figure 3.32**). In addition, the leverage metrics for the general insurance and securities dealers sectors increased for the year ended-September 2020. Similarly, the leverage metrics for the life insurance sector increased due to a greater than proportional increase in total financial assets relative to equity.

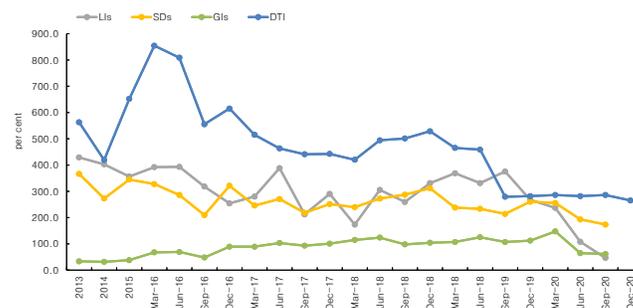
3.5.2 Maturity and liquidity transformation

As it relates to maturity gaps, the ratios of maturity mismatch for DTIs and for general insurance companies increased for the period under review. The performance for the DTI and general insurance sectors mainly reflected growth in long-term assets relative to long-term liabilities. Conversely, risks emanating from the maturity mismatch of long-term assets and liabilities declined for the life insurance and securities dealers sectors (see **Figure 3.33**).

The outturn for life insurance and securities dealers resulted from a larger than proportional increase in long-term liabilities relative to growth in long-term assets.

²⁶ Total DTI credit is comprised of private sector credit plus corporate securities held by DTIs plus public sector credit. Private sector credit is comprised of DTIs' loans and advances to the private sector excluding credit to overseas residents and other financial institutions.

Figure 3.34 Liquidity transformation – DTIs, securities dealers and insurance companies



Note: Liquidity Transformation is calculated as short term liabilities [≤ 30 days] divided by liquid assets. Liquid assets include high quality liquid assets, such as cash and equivalents, short-term investments and government securities with a 0% risk-weight. An increase in this indicator signals higher risks.

Liquidity transformation improved across the DTI, securities dealers, general and life insurance sectors. The outturn for DTIs, general insurance companies and securities dealers was due to stronger growth in liquid assets relative to the growth in short-term liabilities (see **Figure 3.34**).

3.6 Payment system developments

3.6.1 Key developments in large value payments^{27,28}

For 2020, market activity in the JamClear®-RTGS system exhibited mixed results. These results largely reflected the impact of the COVID-19 pandemic on economic activity. In particular, overall transaction values within the JamClear®-RTGS system declined sharply to \$12.5 trillion for 2020 from \$20.3 trillion for 2019. The system turnover was 6.3 times GDP compared to a system turnover of 9.5 times GDP for the preceding year (see **Figure 3.35**).²⁹

²⁷ JamClear®-RTGS statistics include both JMD and USD denominated transactions.

²⁸ The JamClear®-RTGS system consists of 23 full members: eight commercial banks, two clearing house, one building society, one merchant bank, eight primary dealers (broker dealers), the Jamaica Central Securities Depository (Trustee), Accountant General Department (AGD) and Bank of Jamaica (BOJ).

²⁹ Turnover is a ratio of the total transaction value as a percentage of GDP.

Figure 3.35 JamClear®–RTGS systems monthly turnover

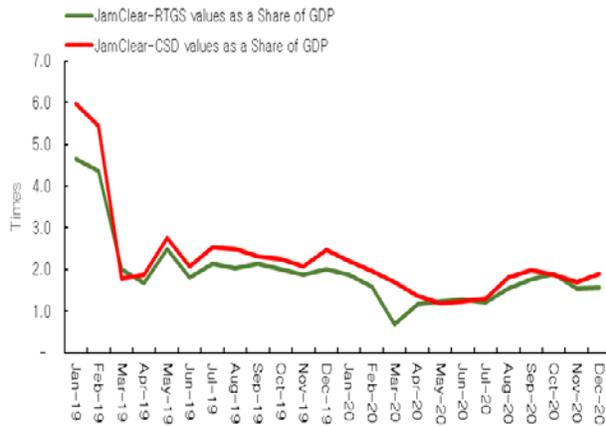


Figure 3.36 JamClear®–RTGS monthly transaction values and volumes

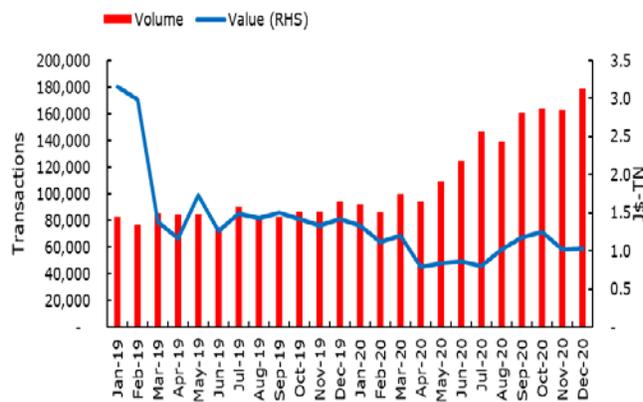
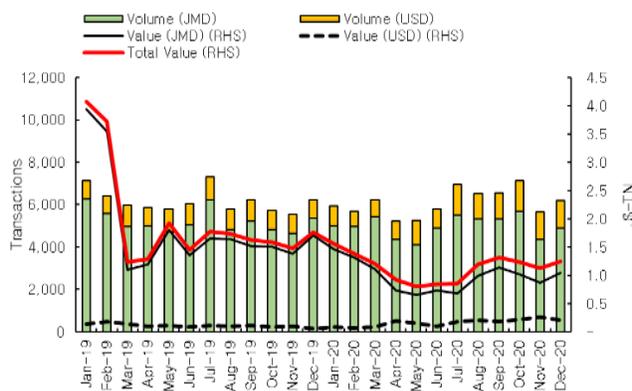


Figure 3.37 JamClear®–CSD monthly transaction values and volumes



Average monthly transaction values decreased by 38.8 per cent to \$1.0 trillion for 2020 and represented an average monthly turnover of 1.6 times monthly GDP.^{30,31}

Conversely, total volume of JamClear®–RTGS transactions grew by 53.5 per cent to 1 557 467 transactions for 2020. Additionally, average monthly transaction volumes increased by 34.8 per cent to 129 789 transactions (see **Figure 3.36**). Customer credit transfers (single and multiple) accounted for approximately 95.3 per cent of total transaction volumes relative to a share of 93.0 per cent for 2019.

During 2020, the sharp fall in the value of transactions in the JamClear®–RTGS system was largely attributable to lower securities settlement transactions which was reflected in declines in both the value and volume of securities traded in the JamClear®–CSD system (see **Figure 3.37**).³² Total transaction value in the JamClear®–CSD system declined by 47.5 per cent to \$11.7 trillion which represented a system turnover of 3.1 times GDP. This performance was also reflected in a decrease in the average monthly value of JamClear®–CSD transactions to \$9.8 billion for 2020, an average monthly turnover of 1.4 times monthly GDP. Similarly, overall volumes fell by 4.3 per cent to 59 962 transactions for 2020.

3.6.2 Key developments in retail payments³³

Retail payments activity contracted for the review period, reflecting the impact of the decline in economic activity due to the pandemic.³⁴ Of note, the average monthly transaction values fell to \$142 136 per person for 2020 from \$155 205 per person for the previous year. Concurrently,

³⁰ The monthly GDP was derived based on the interpolation of quarterly nominal GDP using the quadratic match sum method.

³¹ JamClear®–RTGS overall value does not include general ledger and Financial Institution Transfers (FIT).

³² JamClear®–CSD statistics include both JMD and USD denominated transactions.

³³ All retail payments figures except cash data are per 1000 persons of working age (age 15 and older).

³⁴ Retail payments include cheque payments, debit and credit card payments and other electronic forms of payment.

average monthly transaction volumes declined to 4.9 transactions per person for 2020 from 5.5 transactions per person for the previous year. Notably, debit cards continued to be the most utilized retail payment instrument accounting for 70.8 per cent of the total number of retail payment transactions. The value of cheques as a percentage of the total value of retail transactions declined to 32.6 per cent for 2020 from 39.3 per cent for 2019. This decline reflected the continued migration from paper-based means of payments to electronic forms. There was a noted increase in both the value and volumes of other electronic payments which increased by 16.1 and 40.7 per cent respectively (see **Figure 3.38**).³⁵

Automated Clearing House (ACH)³⁶

Consistent with the Bank of Jamaica’s objective of minimizing net settlement risk as well as the impact of the COVID-19 pandemic, total value of transactions processed by the ACH declined by 8.9 per cent to \$1.1 trillion for 2020.^{37,38} Of the total ACH transaction value for 2020, cheques processed accounted for \$621.3 billion, a decrease of 22.8 per cent relative to 2019. The average monthly value of cheques also declined to \$134 761 per transaction from \$139 197 per transaction for 2019 (see **Figure 3.39**). On the other hand, total volume of ACH transactions increased to 11.8 million for 2020 from 11.3 million for 2019. This was primarily due to increases in both direct credit and debit transactions as the number of processed cheques fell by 20.3 per cent for the review period.

³⁵ Other electronic payments include any transaction conducted without a card such as online transfers.

³⁶ The Automated Clearing House (ACH) is owned by commercial banks, clearing transactions against their account and those transactions made on behalf of other payment services providers with indirect access to the ACH.

³⁷ This performance was attributed to the success of the ACH value threshold of \$1 million which resulted in a reduction in the processing of large value cheques through the ACH.

³⁸ Commercial banks faced a charge of \$5 000.0 per transaction greater than and equal to the targeted ACH threshold of \$1.0 million.

Figure 3.38 Proportion (%) of average monthly retail payment transactions

	2019		2020	
	Value	Volume	Value	Volume
Cheques	39.3	8.7	32.6	6.7
Card Payments				
Debit	38.2	69.7	44.1	70.8
Credit	16.9	18.9	16.8	18.7
Other Electronic Payments	5.6	2.7	6.5	3.8

Figure 3.39 Automated Clearing House monthly transaction values and volumes

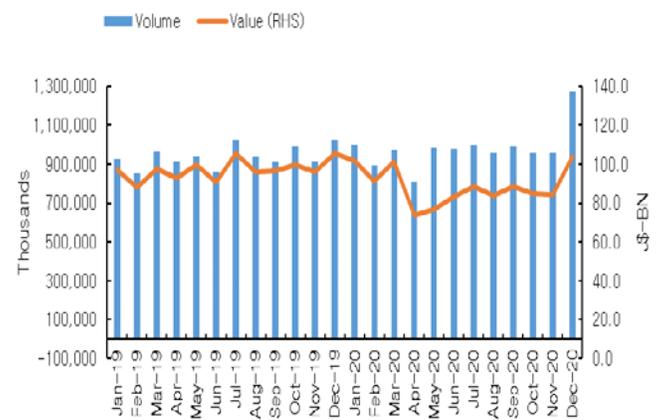


Figure 3.40 MultiLink monthly transaction values and volumes

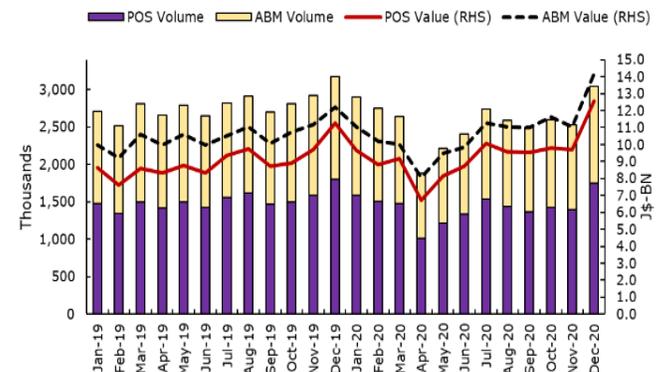


Figure 3.41 Inter-bank and intra-bank cheque volumes and values per person

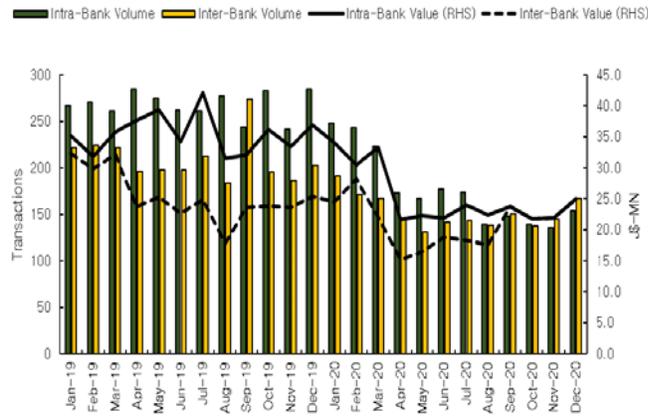


Figure 3.42 Debit & credit card volumes and values per person

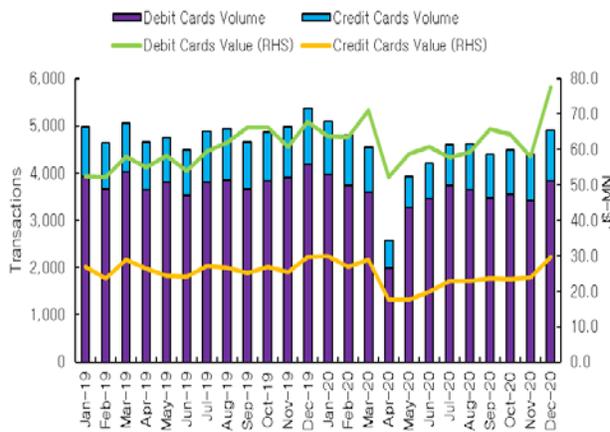
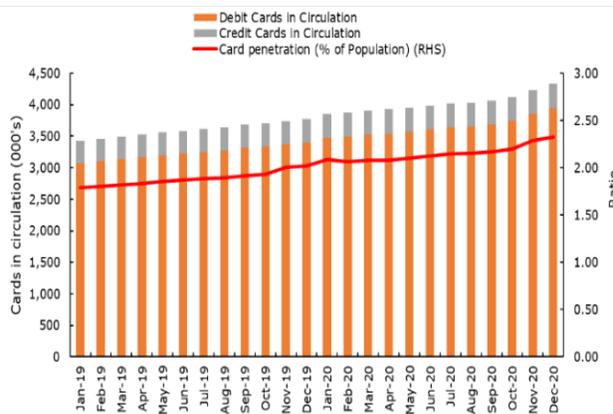


Figure 3.43 Monthly credit and debit cards in circulation



MultiLink

For 2020, there was a reduction in the volume of electronic retail means of payments due to efforts to reduce person-to-person interaction and maintain physical distance. Year-on-year growth in the total value of MultiLink transactions decelerated to 3.1 per cent from the increase of 14.5 per cent recorded for the prior year. This deceleration was influenced by slower growth in both point-of-sale (POS) and automated bank machine (ABM) transaction values. In addition, overall MultiLink transaction volumes declined to 30.8 million from 33.5 million transactions for 2019 with ABM transactions accounting for majority of the decline. In particular, the number of ABM transactions fell by 10.5 per cent to 13.7 billion while the number of POS transactions declined by 6.0 per cent to 17.1 billion for 2020 (see Figure 3.40).

Paper-based Instruments

Cash

Notwithstanding, the increased usage of electronic means of payment over the past few years, cash continued to be the preferred means of payment for retail consumers. Currency in circulation rose by 28.0 per cent to \$190.4 billion for 2020, relative to growth of 15.3 per cent for 2019. In addition, the average monthly level of currency in circulation as a share of annual GDP, increased to 8.0 per cent for 2020 from 5.9 per cent for 2019. Average monthly currency in circulation as a share of M1 also increased to 50.8 per cent for 2020 from 47.0 per cent for 2019³⁹.

Cheques⁴⁰

Cheque payments continued to decline in 2020. The average monthly cheque transaction value declined to \$46 313 per person from \$60 919 per person for 2019. Furthermore, the value of average monthly intra-bank cheque transactions declined to \$25 200 per person from \$35 500 for

³⁹ M1 is a narrow measure of the money supply that includes physical currency, demand deposits, traveler's checks, and other checkable deposits.

⁴⁰ These transactions capture both interbank and intrabank cheque transactions.

2019, while the value of inter-bank transactions declined by 17.0 per cent to \$21 100 per person.

At the same time, average monthly cheque transaction volumes declined by 31.1 per cent to 0.3 transactions per person. This reduction reflected declines in both intra-bank and inter-bank average cheque volumes by 34.1 per cent and 9.7 per cent to 0.2 and 0.1 transactions per person, respectively (see **Figure 3.41**).

Card payments

Card payment activity showed mixed result for 2020. Specifically, the value and number of credit cards processed by commercial banks declined by 8.8 per cent and 11.9 per cent to \$287.1 million and 10.9 transaction per person, respectively. Meanwhile, debit card transaction values increased by 5.6 per cent to \$752.0 million per 1000 persons for the review period.

However, debit card volumes reflected a decline of 9.2 per cent to 41.6 transaction per person (see **Figure 3.42**). The average number of cards in circulation increased by 4.8 per cent to 4.6 million. Within this context, average monthly card penetration increased to 2.2 cards per person for 2020 from 1.9 for 2019 (see **Figure 3.43**).⁴¹

The onset of the pandemic in March 2020 contributed to a sharp reduction in the average monthly number of US dollar card transactions. Specifically, during 2020, the average monthly number of US dollar card transactions reflected a significant decline of 48.9 per cent to 102 transactions per 1000 persons (see **Figure 3.44**). However, there were signs of a reversal of the decline in the number of transactions during the latter part for the year.

Figure 3.44 Domestic exchange rate and US dollar card transaction per 1000 persons and exchange rate

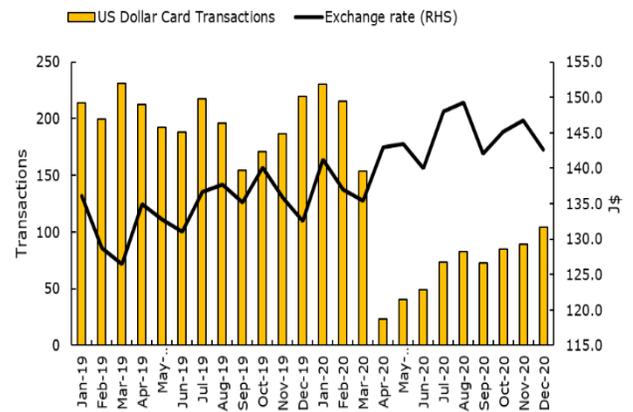


Figure 3.45 Number of active POS and ABM Terminals

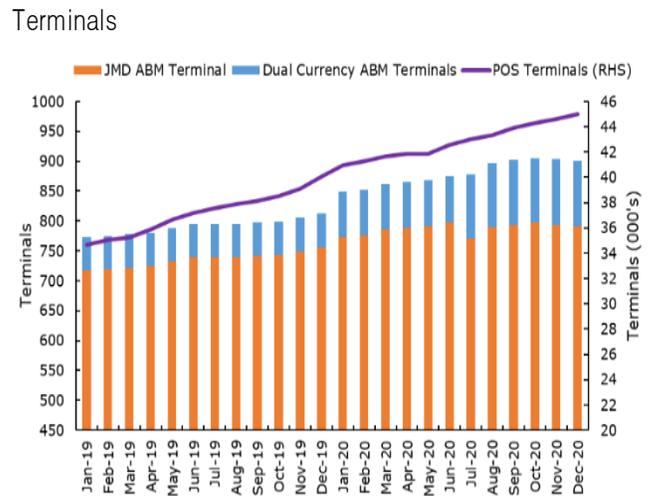
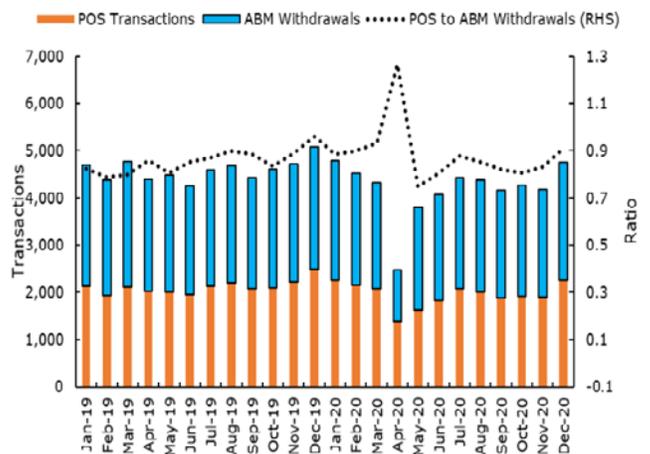


Figure 3.46 POS transactions to ABM withdrawals



⁴¹ Cards penetration is total credit and debit cards (JMD, USD and dual currency) to the working population (14 years and older).

Figure 3.47 Large-value system concentration risk index

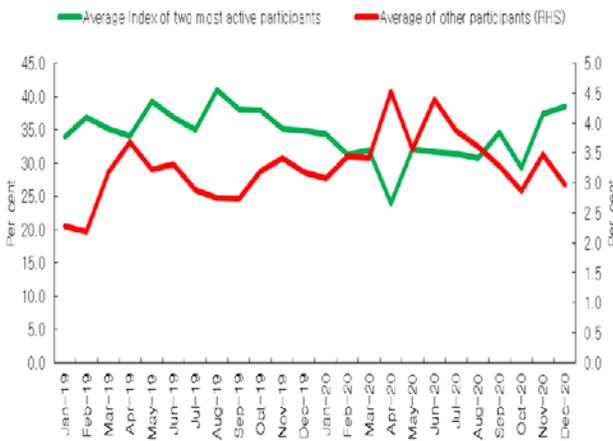
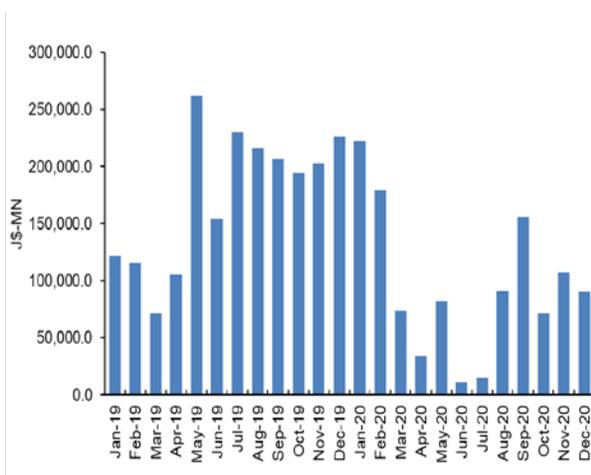


Figure 3.48 Herfindahl index of JamClear-RTGS payment activity



Figure 3.49 BOJ intraday repo facility monthly transaction value



Electronic payment channels offered by commercial banks

Consistent with efforts by banks to reduce the number of in branch transactions, the number of active ABM and POS terminals operated by commercial banks continued to increase in 2020. Specifically, ABM active terminals increased by 4.8 per cent to 791, while the number of active POS terminals grew by 12.4 per cent to 45 002 (see **Figure 3.45**). However, the average monthly number of ABM withdrawals declined by 9.6 per cent to 2 236 transactions per 1 000 persons. At the same time, the average monthly POS transactions decreased by 8.1 per cent to 1 945 transactions per 1 000 persons.

The ratio of POS transactions to ABM withdrawals, which measures customers' preference for using either electronic transactions channel, increased marginally by 0.05 percentage point for 2020 relative to 2019. (see **Figure 3.46**).

3.7 Concentration risk in the Large-value system⁴²

Concentration risk, as measured by the large-value payment system concentration index, reflected a decline for 2020 relative to the previous year.⁴³ Notwithstanding, the two most active participants continued to dominate the share of payment activity, with both accounting for an average monthly share of 32.3 per cent during 2020 relative to 36.5 per cent for 2019. On the other hand, the monthly average share of activity for other participants within the system

⁴² This measure is computed based on payments made and received by each bank as a share of overall payments for the system.

⁴³ The LSCRI records the share of payment activity between:
a) the two most active participants in relation to all other participants; and
b) all other participants in relation to the two most active participants.

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

increased to 3.5 per cent at end-2020 from 3.0 per at end-2019 (see **Figure 3.47**).

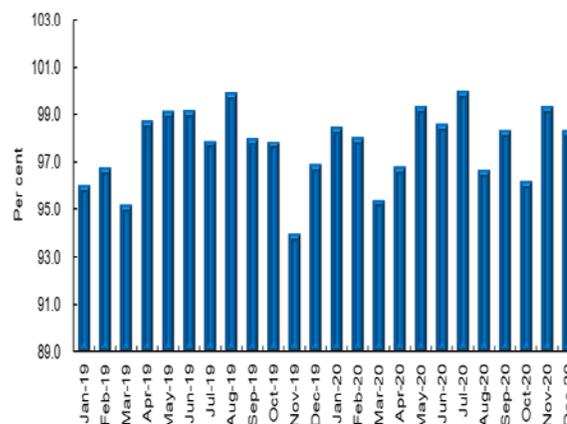
During 2020, the level of liquidity concentration within the JamClear®-RTGS system, as measured by the Herfindahl index, moderated relative to 2019. In particular, the index averaged 0.1 for 2020 relative to an average index value of 0.2 for 2019 (see **Figure 3.48**).⁴⁴ The improvement in the levels of concentration, as indicated by both the HHI and LSCRI, indicated a tempering of potential systemic risk within the Jamaican payment system. Nonetheless, there will need to be continued surveillance of systemically important financial institutions (SIFIs), especially within the JamClear®-RTGS.

3.7.1 Liquidity risk

Usage of BOJ's intraday liquidity facility⁴⁵

For the review period, there were declines in the average monthly and overall value of BOJ's intraday liquidity facility usage (see **Figure 3.49**). The reduced usage of the facility mainly reflected the impact of actions undertaken by the Bank of Jamaica in March 2020 to facilitate expanded access to Jamaica dollar liquidity through various channels amid the COVID-19 pandemic.⁴⁶ Of note, the average monthly and overall value of BOJ's intraday liquidity facility usage decreased to \$94.3 billion and \$1.11 trillion, respectively, for 2020, relative to respective values of \$175.5 billion and \$2.1 trillion for 2019. Similarly, the

Figure 3.50 Share of BOJ intraday repos (values) demanded by the top four subscribers during 2019 & 2020



number of intra-day liquidity transactions declined by 33.9 per cent to 1 044, relative to 2019. However, as it relates to the BOJ intra-day repo facility, the percentage of funds demanded by the top four institutions remained consistently above 90.0 per cent for 2020 (see **Figure 3.50**).

⁴⁴ Values 0.2 and above indicates that the system is concentrated, while values below suggest that the system is competitive

⁴⁵ The BOJ's intraday liquidity facility provides funds to system participants to minimize their liquidity exposure brought about by timing mismatches between incoming and outgoing payment activities.

⁴⁶ These channels include: (a) removing the current limits on the amounts that DTIs borrow overnight without being charged a penal rate; (b) re-introduction of a facility whereby the central bank can make Jamaica Dollar liquidity available to DTIs for periods up to six months; (c) The Bank committed to purchasing GOJ securities on the secondary market from holders of these instruments, to intermediate funds between holders of liquid balances and others who require liquidity and (d) activate the Emergency Liquidity Facility that was established in 2015 upon application by any financial institution.

Box 3.1 Financial Deepening 2020 Initiatives

Bank of Jamaica continued to lead the implementation of Jamaica's financial deepening agenda during 2020. The Implementation Group collaborated with the various stakeholders to initiate and implement reforms aimed at deepening capital markets, increasing transparency, price discovery and improving access to financial services. The main highlights in the respective focus areas are as follows:

1. Improving transparency and price discovery in markets

The Financial Deepening Implementation Group focused on two key initiatives in 2020 to facilitate increased transparency and efficient price discovery in markets. The first key initiative undertaken was the development of a private market, which is a formal channel for the trading of private placements of equity and debt on the Jamaica Stock Exchange (JSE) National Association of Securities Dealers Automated Quotations (NASDAQ) platform. This platform is expected to facilitate greater efficiency and transparency in the securities market, provide reliable price discovery and encourage increased liquidity relative to the over the counter operation.

The private market was launched in January 2021 subsequent to the FSC's approval of the rules governing the initiative in December 2020. The development of the private market was completed as a result of the collaboration of JSE, BOJ, FSC and the Jamaica Securities Dealers Association (JSDA).

The second initiative is a project to facilitate the listing and trading of GOJ local securities on the

JSE NASDAQ platform which is expected to facilitate greater market information, increase liquidity and lead to efficient price discovery. In February 2020, a stakeholder group, with representatives from the BOJ, FSC, JSE, JSDA and the Ministry of Finance and the Public Service, was established to drive the project. In December 2020 a first draft of the business requirement document was completed.

During 2020, amendments were also made to the Securities Regulations which allowed for a more competitive fee structure for the trading of debt.

2. Institutions Standardizing Asset Quality

BOJ and FSC collaborated to establish a national ratings scale infrastructure to facilitate the bringing to market of high-quality assets. The FSC is finalizing a work programme to implement the recommendations from the note that was drafted in December 2020 to address the gaps in the infrastructure related to unsophisticated investors.

Discussions have advanced regarding the proposed credit rating by Caribbean Information & Credit Rating Services Limited (CariCRIS) of GOJ debt on a national scale. This is a key element of the infrastructure as the elaboration of a national rating scale provides an anchor for information to assess credit risk. Furthermore, CariCRIS announced intentions to open a branch office in Jamaica by March 2021, which bodes well for the ongoing efforts to strengthen the credit rating infrastructure.

During 2020, both the BOJ and the FSC undertook liquidity management and capital

¹ The financial deepening agenda focuses on implementing reforms and initiatives aimed at expanding

the range of domestic assets that are formally intermediated and to develop an ecosystem for deeper financial markets.

adequacy reforms. In October 2020, BOJ increased the minimum requirement of its Liquidity Coverage Ratio (LCR) to 100 per cent and also initiated work to reform the capital adequacy framework for DTIs.² The increased LCR is expected to materially incentivize and increase the demand for and listing of high-quality liquid assets on the JSE which will add further depth to the market. A market sensitization session was held in December 2020 to brief participants on the implications for capital markets. In January 2021 a second session was convened during the JSE Annual Regional Capital Market Conference.

3. Implementing an Electronic Reverse Factoring Platform³

The Development Bank of Jamaica (DBJ) progressed with work to implement an electronic platform to scale the use of reverse factoring in Jamaica. In April 2020, the DBJ signed the contract with the platform provider which facilitated the commencement of the integration process. The electronic platform became available for use in July 2020 following the completion of the testing phase. For the remainder of 2020, the DBJ bolstered its engagement with deposit taking institutions and anchor firms in an effort to secure their participation on the platform. DTIs that have confirmed interest in utilizing the platform, have begun reviewing their internal processes to ensure a successful implementation of the product.

4. Accelerating the creation of domestic investible assets

The Development Bank of Jamaica continued to work on Public Private Partnership (PPP) and

privatization transactions that when completed would lead to the monetization of non-core government assets. COVID-19 adversely affected the pace of completion of the transaction due to the reallocation of some resources to address the impact of the pandemic. For 2021, the DBJ will continue to work closely with relevant entities to finalize various transactions, which include the privatization of the Jamaica Mortgage Bank and the sale of government shares in the Jamaica Public Service Company on the JSE. The financial deepening team will also engage and collaborate with other government agencies in its efforts to securitize and monetize GOJ assets. The completion of these and other transactions augurs well for continued capital market development as investors seek additional investible assets.

5. Reform Focus for 2021

For 2021, the financial deepening team will focus on finalizing the implementation of initiatives which were in progress in 2020, specifically:

- (i) utilization of the reverse factoring platform;
- (ii) listing of GOJ securities on the JSE NASDAQ platform; and
- (iii) the completion of key PPP and privatization transactions.

In addition, emphasis will be placed on identifying and implementing reforms to further enhance the environment for the issuing, listing and trading of Jamaican corporate debt securities. This will be complemented by regulatory reforms that will further encourage the use of independent credit ratings which will facilitate increased supply of high-quality liquid

² The changes includes allowing for the application of external ratings as an input for the risk-weighting framework. This shift provides an opportunity for DTIs to hold highly rated exposures to corporate.

³ Under reverse factoring, a supplier receives finance in relation to its receivables (money for goods/services delivered) by a process that is started by the Buyer (ordering company). It allows the supplying company to

receive better finance terms than it would otherwise be able to receive from a lender. Reverse factoring would allow suppliers to be paid in a timely manner for a fee that is determined between large retailers and banks. Reverse factoring provides an alternate to traditional collateral based financing for SMEs.

assets.⁴ Finally, the financial deepening implementation team will explore additional mechanisms to facilitate increased access to financial services for micro, small and medium enterprises.

⁴ There is currently a dearth of level 2 assets so the DTIs have been mainly using level 1 assets to meet the 100% LCR minimum. A key component of the financial deepening agenda is pursuing reforms to facilitate the expansion of debt and equity issues qualifying as high-quality liquid assets (particularly level 2) by identifying and implementing initiatives for improving the ecosystem for the issuing, listing, trading and rating of Jamaican corporate securities.

Discussions have started with the security dealers/arrangers regarding the expected increased demand for level 2 HQLA by DTIs and the incentives and benefits of having those corporate issues rated and traded. Successful reform will see DTIs increasing their demand for corporate issues as part of their liquidity management.

Box 3.2 Bank of Jamaica FinTech Regulatory Sandbox

The global surge in financial technologies has led to the implementation of the regulatory sandbox by several policymakers around the world.¹ These new technologies offer significant efficiency gains, more consumer choice and enhanced financial inclusion. Countries across the globe have opted for regulatory sandboxes to facilitate payment system innovation while keeping abreast of emerging risks to the financial system. The United Kingdom Financial Conduct Authority pioneered the world's first regulatory sandbox in 2015.

On 1 February 2013, BOJ published the initial Guidelines for Electronic Retail Payment Services (ERPS) and revised the Guidelines and ERPS 23 which took effect 1 February 2019. Further review of the overall legislative framework highlighted gaps in the existing framework that would adversely affect the country's national risk assessment.

The Caribbean Financial Action Task force (CFATF) spearheaded an assessment of Jamaica's existing Anti-Money Laundering and Counter-Terrorist Financing (AML/CFT) framework in 2015. The results outlined the need to improve certain deficiencies in Jamaica's AML/CFT framework, to enhance the security of the financial system and bring it closer in line with international AML/CFT standards.

The CFATF is the regional body tasked by the Financial Action Task Force (FATF) to assess the AML/CFT controls in the Caribbean, while, FATF is the global standard-setter for anti-money laundering and counter terrorism financing rules. The FATF measures the effectiveness of AML/CFT regime geared towards interrupting or preventing criminals from benefiting from the proceeds of their crime.

¹ The regulatory sandbox is a framework implemented by regulators to allow small-scale testing of innovations by firms in a controlled environment

To this end, Jamaica was required to commit to the FATF an Action Plan that would address the identified weaknesses. This Action Plan included the completion of the national risk assessment, among other things. Jamaica's comprehensive national risk assessment that was approved by Cabinet in August 2016 and is scheduled for completion in 2021.

The national risk assessment aims to provide a comprehensive report that identifies risks associated with the financial, legal, accounting, real estate, jewellery, remittance, pawn broking, car dealership and non-profit sectors among others. The assessment was designed to provide the government with a better understanding of Money Laundering (ML) and Terrorism Financing (TF) risks and would aid in the development of mitigating policies and strategies. The ERPS 2 Guidelines were not supported by a comprehensive legislative and regulatory framework for overseeing and enforcing anti-money laundering procedures to mitigate ML/TF risks and in this regard were withdrawn on 02 March 2020.

1. Launch of FinTech Regulatory Sandbox

The primary benefit of a regulatory sandbox is that it provides an environment in which risks and liabilities to the stability of the financial system can be discovered and properly managed prior to the full-scale launch of products or services to market.

The operation of the regulatory sandbox will be guided by the Fintech regulatory Sandbox Guidelines (Sandbox Guidelines) which took effect on 16 March 2020. The Sandbox Guidelines are developed pursuant to Section 28 of the Payment, Clearing and Settlement Act of 2010 (PCSA, 2010).²

²http://www.boj.org.jm/uploads/news/bank_of_jamaica_fintech_regulatory_sandbox_guidelines__22_june_2020.pdf

The Bank, in developing the Sandbox Guidelines, adopted four (4) characteristics as follows:

1.1 *Objectives* – The regulatory sandbox aims to provide a platform to encourage innovation in financial products and services, incentivize digitization to enhance access to digital financial services, promote sustainable financial inclusion, and promote competition while protecting consumers and mitigating risks associated with digital financial services.

1.2 *Eligibility Criteria* – Provide the standards for which the Bank will accept applicants for the regulatory sandbox. Applicants should demonstrate that their products and services are innovative, benefit customer and country, do not fall under any regulatory regime and are ready for immediate testing. Applicants must have resources and expertise to mitigate and control potential risks and losses.

1.3 *Duration/Timing* – The Bank’s regulatory sandbox provides a maximum duration of 24 months for testing.

1.4 *Safeguards* – The safeguards for operating within the regulatory sandbox highlight the requirements for:

- o financial and client limits;
- o consumer protection mechanisms and
- o risk management arrangements.

2. Eligible Institutions

Regulated Entities eligible to participate in the sandbox include DTIs, cambios, remittance service providers, and securities dealers which have been authorized by the FSC to participate in the Sandbox. Other eligible entities include credit unions, Fintech companies in partnership

with a DTI; Fintech companies offering solutions not related to a payment service and may not necessarily require partnership with a DTI as well as entities invited by BOJ to provide technology solutions.

Figure 1 Sandbox Activity Table as at December 31, 2020

Details	Number of Fintech Products
Sandbox Applications	10
Approved Pilots	3
Pilot in Progress	1
Completed Pilots	0

3. Potential Impact on Financial Stability

The implementation of the regulatory sandbox improves the potential of the Bank to obtain evidence on the benefits, risks and implications of emerging technologies. In facilitating the identification of new risks of emerging technologies, the regulatory sandbox promotes the faster implementation of policies, legislation and the requisite measures needed to mitigate these risks and bolster financial stability.

The regulatory sandbox will also support data collection to improve analysis and provide input into financial stability measures and policies. Additionally, the regulatory sandbox will aid the Bank to keep abreast of emerging Fintech solutions and their potential use for Money Laundering and Terrorism Financing. This capability will ensure that the requisite safeguards will be in place to protect both firms and potential consumers prior to market launch. Overall, the rigor of the regulatory sandbox process will continue to support the Bank’s financial stability mandate of the monitoring and management of systemic risks.

³[http://www.boj.org.jm/uploads/news/2019_erps_guidelines_for_electronic_retail_payment_services_\(erps_2\).pdf](http://www.boj.org.jm/uploads/news/2019_erps_guidelines_for_electronic_retail_payment_services_(erps_2).pdf)

Box 3.4 Greater Deposit Insurance Coverage

The global financial crisis, which occurred during 2007 and 2008, highlighted the importance of maintaining depositor confidence in the financial system and the key role that deposit insurance schemes play in maintaining that confidence. In response to the crisis, a number of countries substantially increased their deposit insurance coverage limits in order to maintain market confidence and to avert potential runs on their banking sectors. The coverage limit is the maximum amount a depositor is guaranteed to be reimbursed in the event of the failure of a DTI and resolution is the only method for a payout.¹ An appropriate deposit insurance coverage limit helps to support and promote depositor confidence and financial stability as well as the economy. The determination of an adequate coverage limit is guided by international best practices in the area of deposit insurance. At the end of August 2020, Jamaica's Deposit Insurance coverage was increased. This increase has implications for financial system confidence and stability, especially during the COVID-19 pandemic.

1. International Guidance

According to the International Association of Deposit Insurers' (IADI) Core Principles for Effective Deposit Insurance Systems, coverage should be limited, credible and cover the large majority of depositors but leave a substantial amount of the value of deposits exposed to market discipline² Deposit insurance coverage should be consistent

with the deposit insurance system's³ public policy objectives and related design features. In order to make certain that coverage remains credible, coverage limits are reviewed periodically to ensure that it meets the public policy objectives⁴ of the deposit insurance system and where necessary, adjusted.

The following are additional guidance with respect to a credible coverage limit:⁵

- 1.1. The coverage limit should be at a level that fully protects most retail depositors. This should range upwards from 90–95 per cent of the number of total deposit accounts in the system;
- 1.2. To ensure equity, the deposit insurer should apply the same level and scope of coverage to all member institutions;
- 1.3. The value of the insured deposits at risk of loss and the likelihood of failure should be estimated and assessed;
- 1.4. Funding requirements should be examined to support coverage limits and to ensure that adequate funding for a typical loss is available, whether from an ex-ante deposit insurance fund or secured ex-post funding

¹ Other resolution options include: mergers and acquisitions, purchase and assumptions, bridge banks and bail-ins

² See IADI Core Principles 8 (2014)

³ Deposit Insurance System is a measure implemented in many countries to protect bank depositors, in full or in part, from losses caused by a bank's non-viability.

Deposit insurance Systems are one component of a

financial system safety net to promote and maintain confidence in the system.

⁴ The Public Policy Objective of the JDIC is to protect the majority of retail depositors thereby contributing to confidence and stability in the financial system.

⁵ IADI Enhanced Guidance for Effective Deposit Insurance Systems: Deposit Insurance Coverage, 2013

arrangements.^{6,7} Additionally, the international standards recommend that deposit insurers arrange for liquidity funding in advance for timely access to emergency funding, should it become necessary; and

- 1.5. The deposit insurance coverage limit should be reviewed on a regular basis. In reviewing the coverage limit, it is an effective practice for the deposit insurer to take into account inflation and changes in real income. This should preserve the value of depositors' purchasing power and the composition and size of deposits, as well as stakeholder's expectations. Additionally, the development of new deposit products, additional funding requirements, the robustness of the supervisory and regulatory framework, the financial performance of the institutions, the performance of the economy and other factors could impact the public policy objectives of the deposit insurance system.

2. Increase in Deposit Insurance Coverage Limit in Jamaica – “You’ve Been Upgraded”

Effective 31 August 2020, the Jamaica Deposit Insurance Corporation (JDIC) increased the coverage limit for depositors to J\$1,200,000 from J\$600,000, under the advertising slogan “You’ve Been Upgraded”. At the new level, the JDIC covers approximately 98 per cent of the deposit accounts in the system, surpassing the international best practice recommendation⁸. This amount is to be paid out of the Deposit

⁶ Ex-ante funding refers to the regular collection of premiums, with the aim of accumulating a fund to meet future obligations (e.g. reimbursing depositors) and covering the operational and related costs of the deposit insurer. Presently the JDIC uses a flat-rate ex-ante funding methodology in order to have available the financial capacity to carry out its mandate timely and effectively.

Insurance Fund in respect of insured deposits, to every depositor of a Policyholder (commercial banks, building societies and merchant banks) in circumstances where the Policyholder ceases to be viable and is insolvent and the winding up of the Policyholder is the decided resolution strategy. Adequate depositor protection is important especially in a jurisdiction of Jamaica's size and interconnectedness, where difficulties in one financial institution could adversely affect the entire financial system and the economy.

The decision to increase the coverage limit was based on decline of the real value of the previous coverage limit over the years due to the movements in inflation and the exchange rate. Other factors that led to the decision to increase the coverage limit included the financial performance of the institutions as well as the robustness of the regulatory and supervisory environment and the strength of Jamaica's economy. The JDIC aims to continue offering a coverage limit that sufficiently protects the large majority of retail depositors, and mitigate against the risk of bank runs. At this new level, the JDIC has determined that there will be a balance between depositor protection and market discipline, tending to mitigate moral hazard.⁹

3. Financial System Confidence Amidst COVID-19

The ongoing crisis caused by the COVID-19 pandemic introduced significant uncertainty in the world's economic and financial landscape, and has reiterated the importance of maintaining depositor confidence and financial system stability. COVID-19 created a series of unprecedented world-wide shocks in the forms

⁷ Ex-post funding refers to a system in which funds to cover deposit insurance obligations are only collected from surviving Banks after a Bank failure.

⁸ IADI recommends a coverage level that fully protects most retail depositors which may range upwards from 90–95 per cent of the number of total depositors.

⁹ Moral hazard arises when parties have incentives to accept more risk because the costs that arise from such risk are borne, in whole or in part, by others.

of a major health crisis, and a severe shock to the real economy and the financial sector.

Against this background, the banking industry in many jurisdictions experienced heightened volatility in capital markets and a deterioration in asset values. Furthermore, the deterioration in the credit worthiness of many borrowers led to concerns regarding the solvency of financial institutions across the globe. In this context, national regulators provided timely support by rolling out a suite of measures to include liquidity assistance to financial institutions. These measures were aimed at mitigating any potential impact on the economy and financial system, arising from the measures put in place to prevent the spread of COVID-19.

Despite the challenges and uncertainties in the global and local economic environments, Jamaica's financial institutions continued to satisfy prudential regulatory obligations. Further, deposits held in deposit-taking institutions increased in the midst of the crisis, indicating that depositors view the system as a safe haven for their funds, buttressed by JDIC's upgraded deposit insurance coverage limit.

The JDIC, as a member of the Financial System Safety Net (FSSN), continues to review the coverage limit and collaborate and work with the other members of the FSSN to promote and maintain confidence and stability within the financial system.

Box 3.4 MSME Finance Charting the way for recovery after COVID-19

In 2020, micro, small and medium-sized enterprises (MSMEs) were severely impacted by COVID-19. The immediate and secondary effects of the COVID-19 pandemic were felt in the reduction of consumer and business confidence, weakened demand due to increased unemployment and reduced work hours as well as reduced economic activity across several industries.

The performance of this sector reflects a sizable risk exposure to the banking system. MSMEs accounted for 11.0 per cent of business loans placed on moratoria by banks as at December 2020. Therefore, the resilience of these business through the down-turn and a quick normalization of their activity will auger well for risks to the financial system.

Despite the negative performance of the economy, the COVID-19 pandemic presented a unique opportunity for MSMEs to adapt new business models focused on digital payments products and e-commerce. In May 2020, under the New Economy Taskforce, work commenced on encouraging the use of technology by MSMEs, including digital payments and removal of barriers to accessing finance.¹

1. Improving access to banking and payment services for MSMEs

In January 2020, Bank of Jamaica began work on sensitizing its regulated entities on simplified customer due diligence requirements which were permitted by the legislative amendments to the Proceeds of Crime Act and the Proceeds of Crime (Money Laundering Prevention) Regulations. This work continued in August 2020, with Bank of Jamaica partnering with the PSOJ Access to Finance Facilitation Panel to communicate to MSMEs and the wider public, the Bank's high level expectations regarding the application of simplified customer due diligence requirements as part of a risk based approach

to anti-money laundering and counter-financing of terrorism.

2. Digitisation Programme for MSMEs

As part of its work to create the business enabling environment for MSMEs, the Ministry of Industry, Investment and Commerce (MIIC) implemented a Digital Transformation Initiative to assist MSMEs to internationalize their operations through e-commerce. MIIC forged alliances with two service providers to facilitate access to technology in order to establish e-commerce platforms to increase access to overseas markets, through intelligent websites, the creation of online shops and easy payment solutions with social media integration.

Currently, over 2,000 MSMEs in all industrial sectors in Jamaica have online access to sell their goods and services globally, thereby improving their ability increase revenue, create employment, generate foreign exchange and scale-up their operations. The objective is to facilitate the digitization of 25,000 MSMEs by the end of 2022.

3. PSOJ Access to Finance Facilitation Panel – Equipping MSMEs with “Fit for Purpose” tools and skills to mitigate the impact of COVID-19

In 2020, the PSOJ A2FF Panel began its COVIDCast JA series, an online webinar series, which was designed to provide a platform for MSMEs to engage with industry leaders on critical issues that would empower MSMEs to transform their business operations in the context of COVID-19. The series provided business training opportunities on managing the provision of services, employment issues, utilisation technology and negotiating with financial institutions regarding loans and lines of credit.

¹ Members of the New Economy Taskforce included Bank of Jamaica, JAMPRO, PSOJ Access to Finance Facilitation Panel, the Development Bank of Jamaica and other members of the private sector.

4.0 FINANCIAL SYSTEM SECTORAL EXPOSURE

This chapter examines the vulnerabilities of the financial system due to balance sheet exposures to the household, corporate and public sectors.

4.1 Overview

In 2020, Jamaica's economic environment was largely characterized by contraction in economic activity as well as heightened uncertainty among households and businesses amidst the COVID-19 pandemic. DTIs' exposure to the household, corporate and public sectors exhibited no significant deviation from historical averages. However, despite DTIs' exposure to the household sector remaining relatively stable, there was a notable increase in the ratio of household debt to disposable income in 2020 indicative of rising household sector indebtedness, lower disposable income and potential future losses for DTIs.

Securities dealers' exposure to private sector debt and sovereign risk remained stable for 2020 and reflected marginal declines for both private and public sector debt to asset ratios relative to 2019. For the review year, insurance companies recorded lower exposures to sovereign risk while pension funds' exposure increased, albeit, in line with historical trend.

4.2 Household debt and deposit-taking institutions' exposure

In the context of the COVID-19 pandemic, there was a sharp reduction in economic activity in Jamaica during 2020. In addition, there was heightened uncertainty among households and businesses. These developments led to a deceleration in the growth of household sector debt held by DTIs for the review period.¹ In real terms, household sector debt grew by 3.4 per cent for 2020, relative to growth of 9.4 per cent for 2019 (see Figure 4.1).

Figure 4.1 Real growth in household debt and its sub-components for DTIs

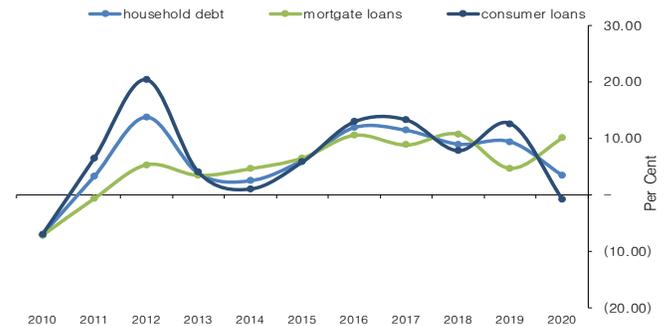


Figure 4.2 Household debt as a share of DTIs' loans & assets

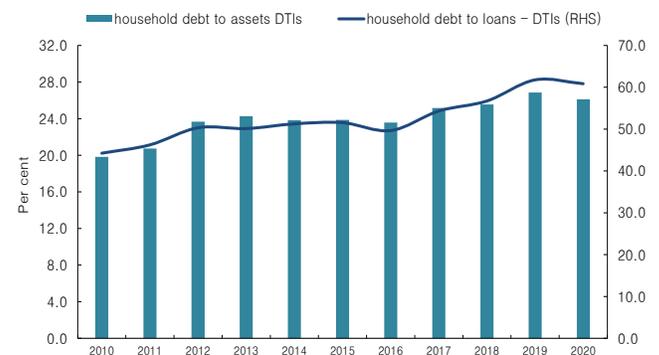
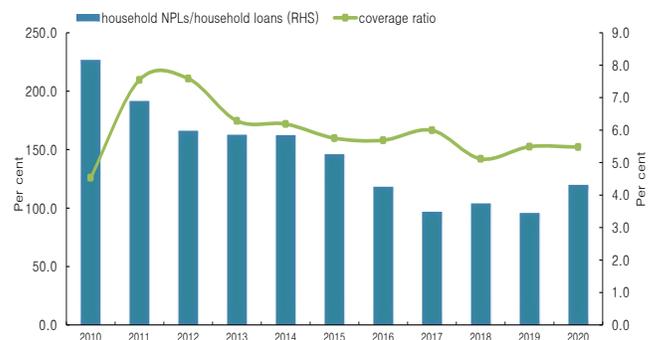


Figure 4.3 DTIs' household sector loan quality & loan loss provisioning to household sector NPLs



¹ Household debt incurred with DTIs is proxied by the sum of residential mortgage loans and consumer loans (which includes credit card receivables).

Table 4.1 Selected interest rates

Sectoral Interest Rates (per cent)	2016	2017	2018	2019	2020
Building societies					
Real Mortgage Loans Rate*	7.1	3.2	5.8	1.5	2.1
Mortgage Loans Rate	9.0	8.6	8.3	7.8	7.4
Average Weighted Loan Rate	9.0	8.7	8.4	7.9	7.5
Commercial banks					
Real Mortgage Loans Rate*	7.6	3.3	5.7	1.4	2.0
Mortgage Loans Rate	9.4	8.7	8.3	7.7	7.3
Installment Credit Rate	13.8	12.4	11.4	11.0	10.7
Personal Credit Rate	25.5	24.0	21.5	21.4	20.9
Commercial Credit Rate	12.3	12.2	10.5	9.9	9.4
Average Weighted Loan Rate	16.2	14.6	13.5	12.5	11.8
Merchant bank					
Personal Credit Rate	10.7	11.0	11.2	9.4	7.8
Commercial Credit Rate	11.7	10.5	9.7	8.3	8.0
Average Weighted Loan Rate	11.6	10.5	9.9	8.5	7.9

* Change in percentage points from Sep 2018 – Sep 2019
* Annual Average Inflation rate used to compute the real mortgage rate.

Figure 4.4 Household debt servicing capacity

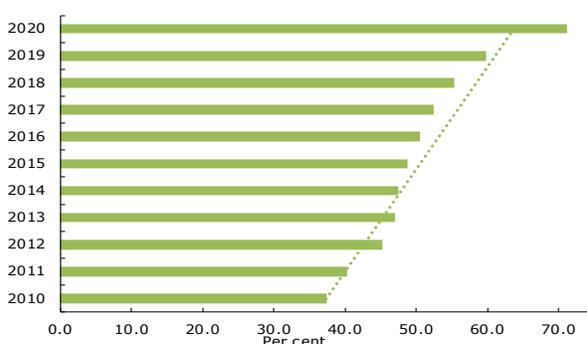
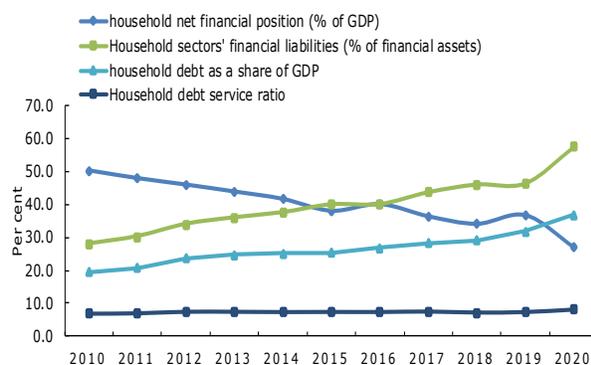


Figure 4.5 Other household sector indebtedness indicators



² The unemployment rate increased to 10.7 per cent in 2020 from 7.2 per cent in 2019.

³ Personal loans continued to trend upward for 2020 with all categories increasing relative to 2019, with the exception of instalment loans which remained the same. Of the total \$528 billion in personal loans issued by DTIs, mortgage loans accounted for \$218 billion or 41.3 per cent for 2020. This was followed by Instalment loans which accounted for \$133 billion or 25.2 per cent, Terms loans which

The slower expansion in real household sector credit mainly reflected a contraction in consumer loans as growth in mortgage credit was relatively robust. Specifically, real consumer loans declined by 0.8 per cent for 2020 compared to an expansion of 12.6 per cent for the prior year. The decline in 2020 reflected the impact of weak disposable income and higher levels of unemployment.² On the other hand, real mortgage debt grew by 10.1 per cent, relative to the increase of 4.7 per cent recorded for the prior year.³ The growth in the review year occurred within a context of greater competition as well as lower mortgage rates among building societies and commercial banks (see **Table 4.1**).

Vulnerability measures showed that DTIs' exposure to the household sector remained relatively stable and was in line with the historical average for the ten-year period 2010–2019. Consistent with a slower pace of growth in household sector debt, DTIs' exposure to the household sector, as measured by household debt to assets, declined marginally at end-2020 to 26.1 per cent, relative to 26.9 per cent at end-2019 and the ten-year historical average of 24.0 per cent (see **Figure 4.2**). Furthermore, household sector debt as a share of DTIs' credit portfolio declined marginally to 60.9 per cent relative to 2019 but was above the historical average of 51.6 per cent.

In relation to DTIs' loan quality, household non-performing loans (NPLs) as a share of total household loans increased to 4.3 per cent at end-2020 from 3.4 per cent at end-2019 amid lower income due to the impact of the COVID-19 pandemic. Notwithstanding, the ratio was below the historical 10-year average of 5.3 per cent. Of note, further deterioration in the NPL ratio was mitigated by loan moratoriums offered by DTIs.⁴ Additionally, DTIs continued to maintain adequate coverage of NPLs as evidenced in the ratio of loan

accounted for \$112 billion or 21.2 per cent and Demand loans which accounted for \$65 billion or 12.3 per cent.

⁴ At the beginning of the pandemic many DTIs' extended loan moratoriums in an effort to ease customers' financial burdens due to the COVID-19 pandemic.

loss provisions plus prudential provisioning to non-performing household loans exceeding 100.0 per cent for the review period (see Figure 4.3).

4.2.1 Household sector indebtedness

The debt servicing capacity of households, as measured by household debt to disposable income, continued to deteriorate in 2020. For 2020, the ratio of household debt to disposable income deteriorated by 10.2 percentage points to 71.5 per cent, relative to 2019 and was well above the ten-year annual average of 49.3 per cent (see Figure 4.4).^{5,6} This outturn was due to a faster pace of growth in household debt of 8.7 per cent relative to a 6.8 per cent decline in disposable income. By extension, other household sector debt sustainability measures also showed a general deterioration for 2020 when compared to the prior year (see Figure 4.5).⁷

4.3 Deposit-taking institutions' exposure to corporate sector debt

DTIs' exposure to the corporate sector, as measured by corporate sector debt to DTIs' assets, decreased marginally by 0.6 percentage point to 18.4 per cent at end-2020 mainly reflecting a slowdown in the growth of corporate lending (see Figure 4.6).^{8,9} Of note, real growth in corporate sector debt held by DTIs moderated to 2.7 per cent for 2020. This outturn compares to growth of 13.0 per cent for 2019 and average real growth of 3.3 per cent for the period 2010-2019. The moderation in the growth of corporate sector debt occurred within the context of a slowdown in economic activity caused by the COVID-19 pandemic. Furthermore, the sluggish pace of growth in corporate sector lending was reflected in most economic sectors with the exception of

Figure 4.6 Real growth in corporate debt held by DTIs & corporate debt as a share of DTIs' assets

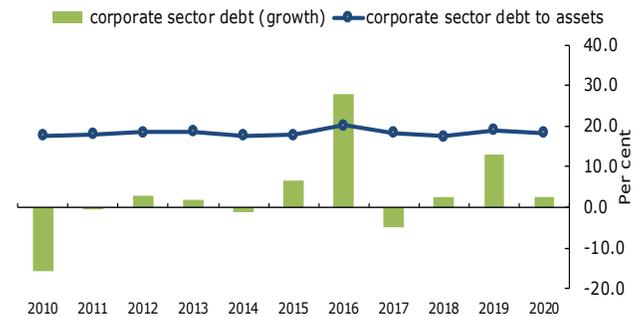


Figure 4.7 Growth in DTIs' lending to the top five corporate sectors

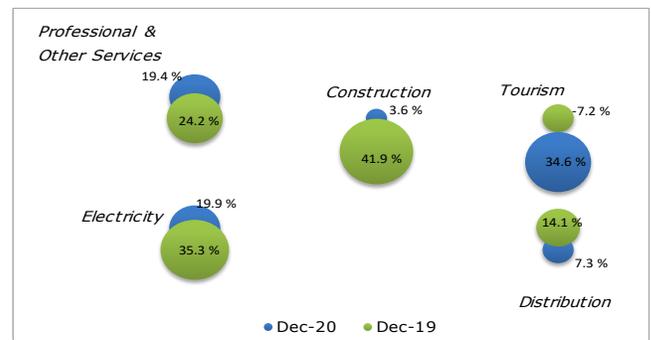
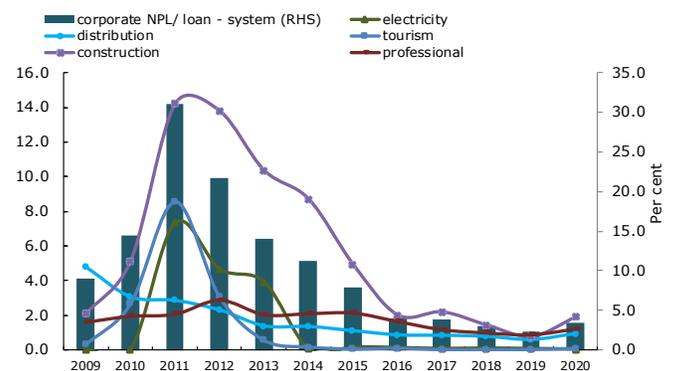


Figure 4.8 Ratio of corporate sector NPLs to corporate sector loans for Top 5 sectors-DTIs



⁵ Total household debt is proxied by the sum of residential mortgage loans, consumer loans (which includes credit card receivables) and National Housing Trust loans.

⁶ BOJ's projection for disposable income is computed as gross personal income less statutory deductions. Gross personal income is proxied as the sum of compensation to employees domestically and from the rest of the world as well as current transfers from rest of the world (which primarily includes remittances). Operating surplus of the household sector is excluded from personal income due to data availability.

⁷ The DSR for households is computed as follows:

$$DSR_{j,t} = \frac{i_{j,t}}{(1-(1+i_{j,t})^{-s_{j,t}})} * \frac{D_{j,t}}{Y_{j,t}}$$

where $D_{j,t}$ denotes the total stock of household debt, $Y_{j,t}$ denotes aggregate household income available for debt service payments, $i_{j,t}$ denotes average interest rate on the existing stock of debt and $s_{j,t}$ the average remaining maturity across the stock of debt.

⁸ This ratio was well within the historical average of 18.4 per cent for the past ten-years.

⁹ Corporate sector debt includes loans for commercial purposes and notes & debenture holdings of DTIs.

Figure 4.9 Corporate sector debt to corporate operating surplus

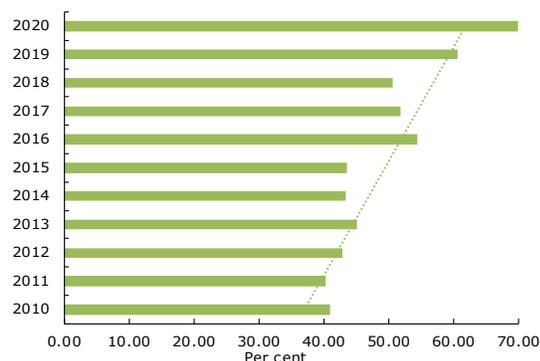


Figure 4.10 Other corporate sector indebtedness indicators

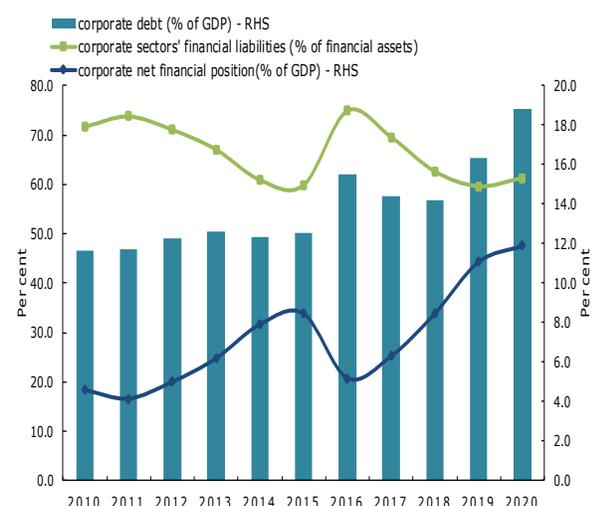
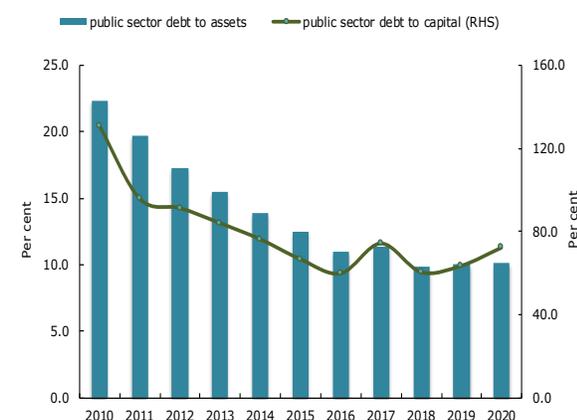


Figure 4.11 Public sector loans and securities to assets & capital – DTIs



Agriculture, Mining, Manufacturing, Tourism and Entertainment. Notably, of the top five economic sectors, based on share of total loans, only *Tourism* recorded improved growth rates relative to 2019 (see **Figure 4.7**). *Distribution, Professional and Other Services, Construction and Land Development, Tourism and Electricity* accounted for the top five economic sectors that DTIs had exposures to at end 2019 and 2020. The *Tourism* sector had the largest increase in exposure, accounting for 16.0 per cent of DTIs' loans to the corporate sector at end 2020, relative to 13.4 per cent at end 2019, becoming their second largest exposure. DTIs' largest exposure remained the *Distribution* sector.

4.3.1 Corporate sector loan quality

There was a marginal deterioration in DTIs' loan quality associated with the corporate sector for 2020. The ratio of corporate sector NPLs to total corporate sector loans increased to 1.6 per cent at end-2020 from 1.1 per cent at end-2019 (see **Figure 4.8**). Specifically, the NPL ratio for all economic sectors deteriorated for 2020 with the exception of *Agriculture, Mining, Manufacturing and Electricity*. Of note, *Construction* recorded the highest increase in the NPL ratio of 2.5 percentage points while *Tourism* recorded the least of 0.1 percentage point.

Construction, Professional & Other Services and Distribution accounted for the largest amount of NPLs among the economic sectors, with 32.9 per cent, 26.6 per cent and 25.4 per cent of corporate NPLs, respectively. Of note, *Tourism* and *Transportation* had the largest proportional increases in NPLs of 153.4 per cent and 141.2 per cent, respectively. These sharp movements reflected the impact of the travel restrictions and nightly curfews imposed to constrain the spread of the novel coronavirus. *Mining* recorded the largest proportional decreases in NPLs, falling by 90.8 per cent.

4.3.2 Corporate sector indebtedness

The debt servicing capacity of the corporate sector deteriorated for 2020, reflecting a faster pace of growth in corporate sector debt relative to

operating surplus (see **Figure 4.9**).¹⁰ Furthermore, corporate sector net financial position as a share of GDP deteriorated slightly to 11.9 per cent from 11.1 per cent at end-2019. This result was due to an increase in net corporate assets coupled with a decline in economic output. Additionally, corporate sector financial liabilities as a share of corporate sector assets increased marginally to 61.3 per cent at end-2020 from 59.6 per cent at end-2019 (see **Figure 4.10**).¹¹

4.4. Deposit-taking institutions' exposure to the public sector

DTIs' exposure to public sector debt was virtually unchanged for 2020. In particular, the ratio of public sector loans and securities to DTIs' assets increased by 0.1 percentage point to 10.1 per cent at end-2020 and was well below the historical ten-year average of 14.3 per cent. The performance for 2020 was mainly influenced by a 12.7 per cent increase in public sector loans and securities for the review period and an 11.8 per cent increase in DTIs' assets. Similarly, the ratio of public sector loans and securities to DTIs' capital increased by 8.7 percentage points to 72.1 per cent at end-2020 but was well below the historical ten-year average of 87.0 per cent (see **Figure 4.11**).

4.4.1 Public sector performance & indebtedness

Within the context of increased government spending and the contraction in economic output, due to the COVID-19 pandemic, public sector debt as a share of GDP increased for the review period. This outturn reflected a reversal of the trend observed since 2014. The ratio increased to 106.5 per cent at end-2020 from 94.7 per cent at end-2019 (see **Figure 4.12**).¹² The higher public sector debt stock reflected growth in both external and domestic debt. For 2020, the external and domestic debt stocks increased by 9.1 per cent

Figure 4.12 Debt to GDP ratios

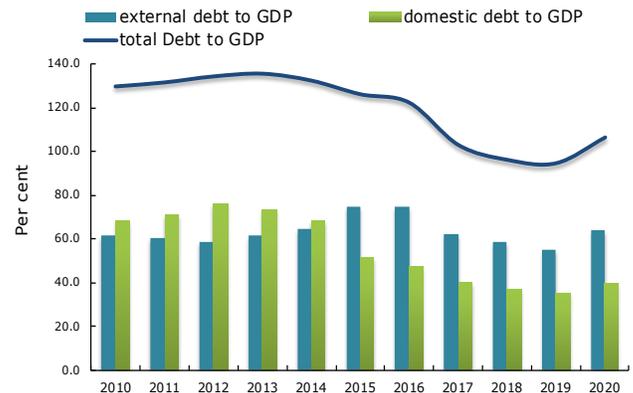


Figure 4.13 Growth in public sector debt stock

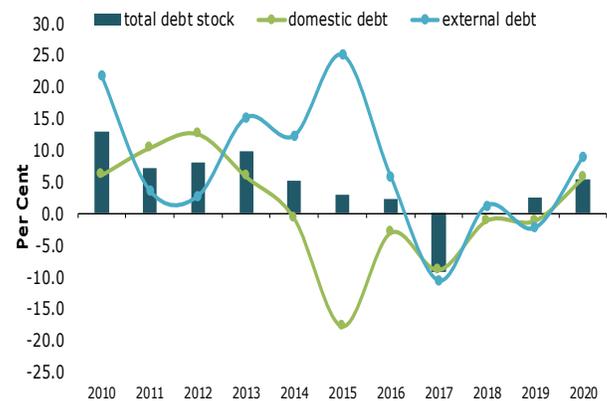
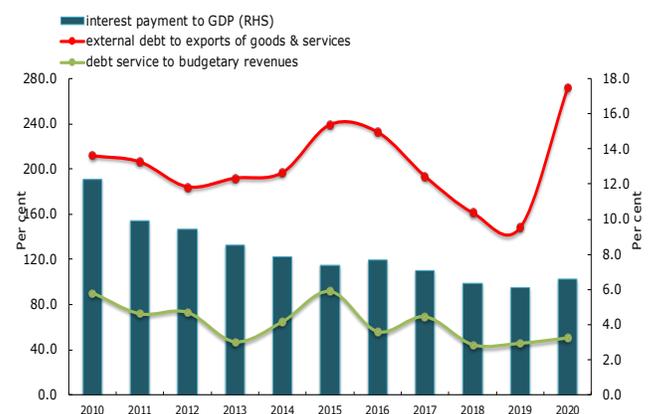


Figure 4.14 Debt sustainability indicators

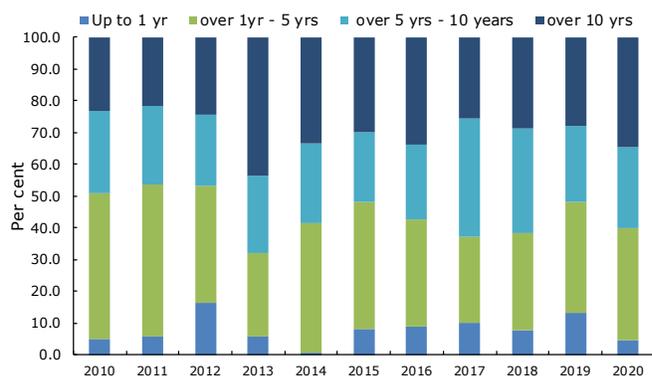


¹⁰ Capacity measured as the share of corporate sector debt to corporate sector operating surplus

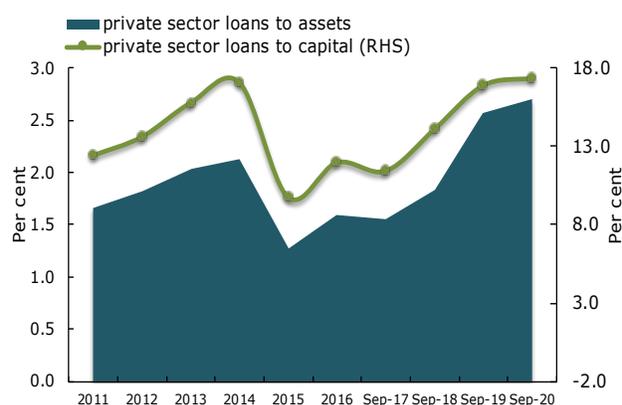
¹¹ The financial assets of corporates include: deposits and retail repos (retail repos figure used is as at September 2020) Corporate financial liabilities on the other hand include: loans for commercial purposes as well as notes & debenture holdings of DTIs (notes and

debentures figure used is as at November 2020). Notably, corporate financial assets does not capture large shares and other classes of corporate assets

¹² Public sector debt stock figures represent data up to November 2020 while GDP data for 2020 is based on projections from the Bank of Jamaica

Figure 4.15 Public Sector domestic debt by maturity

Table 4.2 Share of public sector domestic debt by instrument type (%)

	Fixed rate	Variable rate	Non Interest Bearing Debt
2009	48.9	51.1	0.0
2010	59.3	40.7	0.0
2011	56.5	43.4	0.1
2012	56.0	43.9	0.1
2013	67.9	32.0	0.1
2014	67.7	32.2	0.1
2015	60.8	39.2	0.1
2016	59.6	40.4	0.1
2017	55.7	44.3	0.0
2018	62.3	37.7	0.0
2019	63.0	37.0	0.0
2020	76.1	23.9	0.0

Figure 4.16 Private sector loans to assets & capital for the 12 core securities dealers


and 5.7 per cent, respectively (see **Figure 4.13**). The increase in the domestic dollar value of the external debt stock largely reflected the impact of the weakening of the domestic currency as well as increased borrowing from multi-lateral lending agencies for budgetary support. With regard to the domestic debt stock, the growth reflected new issuances of Treasury Bills and the re-opening of benchmark investment notes (BINs).

The stability of government finances, as measured by the fiscal stability ratio (FSR), deteriorated to 1.13 at end-2020 from 0.95 at end-2019.¹³ This performance was due to lower revenues and grants as well as higher expenditure which resulted in a fiscal deficit, relative to a fiscal surplus for the previous year. In addition, there was deterioration in the debt servicing to budgetary revenues, interest payments to GDP and external debt to exports of goods and services ratios which increased by 4.7, 0.5 and 123.9 percentage points, respectively, for the review period (see **Figure 4.14**).¹⁴

The maturity profile of domestic public debt for the review period showed a decline in refinancing risk.¹⁵ In particular, the proportion of debt due to mature within 1 year declined to 4.7 per cent from 13.4 per cent the previous review period. However, refinancing risk in the medium-term increased marginally, as reflected in a rise in the portion of domestic debt due to mature in 1 to 5 years to 35.3 per cent for 2020 from 34.6 per cent for 2019 (see **Figure 4.15**). Additionally, domestic fixed rate instruments continued to account for the largest share of the total debt stock. The share of domestic fixed rate instruments as a share of the total debt stock increased to 76.1 per cent at end-2020 from a ratio of 63.0 per cent at end-2019 (see **Table 4.2**).

¹³ The FSR is computed as the ratio of the overall fiscal balance as a per cent of total revenue less 1 (one). The closer the FSR is to zero indicates more stable government finances.

¹⁴ The performance of the external debt to exports of goods and services ratio was largely driven by a sharp 44.8 per cent decline in the exports of goods and services.

¹⁵ Refinancing risk is defined as the possibility that a borrower cannot refinance by borrowing to repay existing debt.

4.5. Non-deposit-taking financial institutions' sector exposure

4.5.1 Securities dealers' exposure to private sector debt

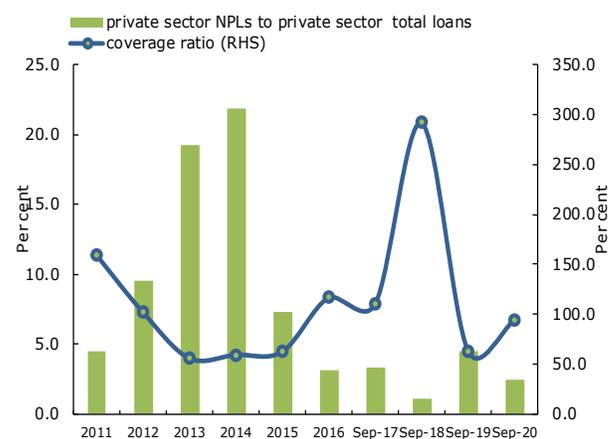
The exposure of the securities dealers to private sector debt remained below 3.0 per cent of securities dealers' total asset base for the review period.^{16,17} Private sector debt as a ratio of securities dealers' total assets increased marginally to 2.7 per cent at end-September 2020 from 2.6 per cent at end-September 2019 (see **Figure 4.16**). Similarly, the ratio of securities dealers' holdings of private sector debt to capital increased to 17.4 per cent at end-September 2020 from 16.9 per cent at end-September 2019. This increase reflected a greater than proportional growth in private sector debt relative to the increase in total assets and capital. Notably, of the twelve securities dealers, only seven institutions had exposure to private sector debt relative to eight at end-September 2019.

Securities dealers' exposure to corporate securities, as measured by corporate securities to assets, increased to 40.5 per cent at end-September 2020 from 28.9 per cent at end-September 2019. Similarly, the ratio of corporate securities to capital increased to 259.7 per cent at end-September 2020 from 190.1 per cent at end-September 2019 (see **Figure 4.17**).¹⁸ These increases mainly reflected greater than proportional increase in foreign securities relative to that of domestic securities. The ratio of foreign securities to assets increased to 27.3 per cent from 18.6 per cent for the previous review period, while domestic securities to assets grew to 13.2 per cent from 10.3 per cent. Likewise, the ratio of foreign securities to capital increased to 175.0 per cent from 122.4 per cent for the previous review period. Domestic securities to capital was 84.7 per cent for the review period relative to 67.7 per cent at end-September 2019.

Figure 4.17 Securities dealers' exposure to corporate securities



Figure 4.18 Private sector NPLs to total private sector loans & coverage ratio for securities dealers

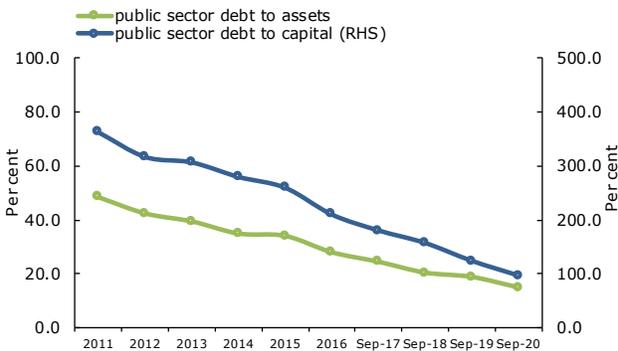


¹⁶ Private sector loans include loans to corporate sector entities and personal (household) loans.

¹⁷ The twelve securities dealers include dealers whose business model is predominantly securities dealing activities and include the top 5 largest Securities dealers'.

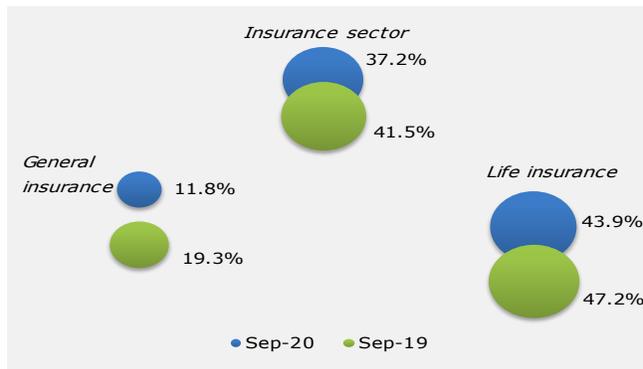
¹⁸ Corporate securities include both foreign and domestic securities

Figure 4.19 Public sector debt holdings to assets & capital for securities dealers



Securities dealers’ loan quality, as measured by private sector NPLs to private sector loans, was 2.5 per cent at end–September 2020, an improvement relative to the 4.5 per cent which obtained at end–September 2019 (see **Figure 4.18**). The ratio at end–September 2020 was also below the average of 2.9 per cent over the past five years. This improvement was largely due to the operations of one institution. There was also a marked improvement in the coverage ratio of securities dealers to 93.5 per cent at end–September 2020 from 62.8 per cent at end–September 2019.

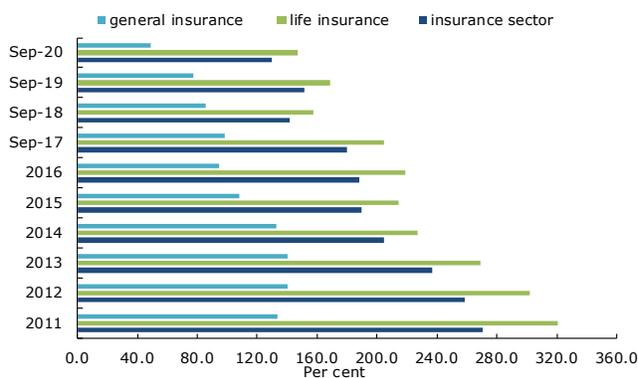
Figure 4.20 Public sector debt holdings to assets for insurance companies



4.5.2 Public sector debt & securities dealers’ exposure

Securities dealers’ exposure to public sector debt continued to trend downward for the review period. This was consistent with measures that have been introduced by the Financial Services Commission since 2014 to reform the retail repo business model of securities dealers. The ratio of securities dealers’ holdings of public sector debt to securities dealers’ assets declined to 14.7 per cent at end–September 2020 from 18.9 per cent at the end of the previous review period. Correspondingly, securities dealers’ public sector debt holdings to capital fell to 94.1 per cent at end–September 2020 from 124.1 per cent at end–September 2019 (see **Figure 4.19**).

Figure 4.21 Public sector debt holdings to capital for the insurance sector



4.5.3 Insurance sector exposure to public sector debt

The insurance sector’s exposure to public sector debt decreased for the review period.¹⁹ Specifically, the ratio of public sector debt holdings to the insurance sector’s assets fell by 4.3 percentage points to 37.2 per cent at end–September 2020 relative to the previous review period (see **Figure 4.20**). This outturn reflected declines in public sector debt holdings for both the life insurance and general sub–sectors. As a share of capital, public sector debt holdings for the insurance sector declined to 129.8 per cent at

¹⁹ Public sector debt is defined as public sector domestic securities which include Bank of Jamaica Securities, Treasury Bills as well as other domestic Jamaican Government Securities.

end–September 2020 from 151.4 per cent at end–September 2019 (see Figure 4.21).

4.6 NDTFIs exposure to real estate and equity

4.6.1 Residential real estate market performance

Activity in Jamaica’s property market remained buoyant. The total value of title transfers for the December 2020 quarter was \$35.7 billion dollars, a 2.7 per cent increase compared to the September 2020 quarter and a 3.1 per cent increase compared to the September 2019 quarter (Figure 4.22).

Excessive price inflation was not evident for properties during the review quarter. The 4 quarter moving average price per square meter of residential properties for All Jamaica, Kingston and St. Catherine increased by 1.8 per cent, 1.4 per cent and 2.1 per cent, respectively at end–September 2020 quarter, relative to the same measure at the end of the previous quarter. Average residential property prices fell by 1.3 per cent across all Jamaica, but increased by 2.3 per cent and 11.3 per cent for Kingston and St. Catherine, respectively, over the review period (Figure 4.23). On the other hand, commercial property prices continued to show gradual declines since 2019. As at end–September 2020, the 4 quarter rolling average price per square meter of commercial properties declined by 24.2 per cent, 22.5 per cent and 30 per cent for All Jamaica, Kingston and St. Catherine, relative to end–September 2019 (Figure 4.24)

Regarding real estate investments, there was a slight increase in exposure for the insurance sector to 1.9 per cent as at end–September 2020 from 1.3 per cent at end–2019, which largely reflected activities within the life insurance sub-sector (see Figure 4.25).^{20,21}

4.6.2 Equity market performance

The Standard & Poor's 500 Index (S&P 500) increased by 16.5 per cent for the review period.

Figure 4.22 Value of Transfers and Price per Transfer



Figure 4.23 Average Price per Square Meter Residential Properties (4 qtr moving average)

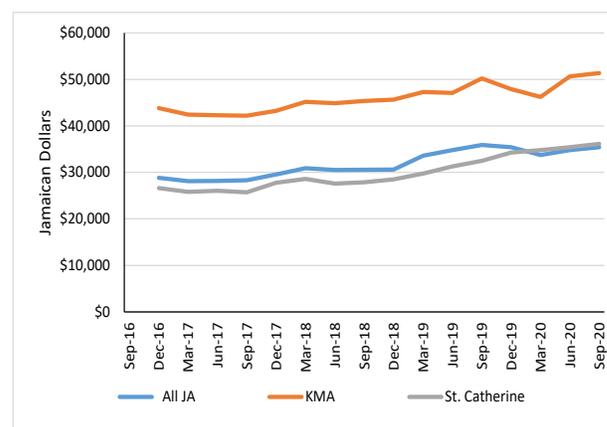
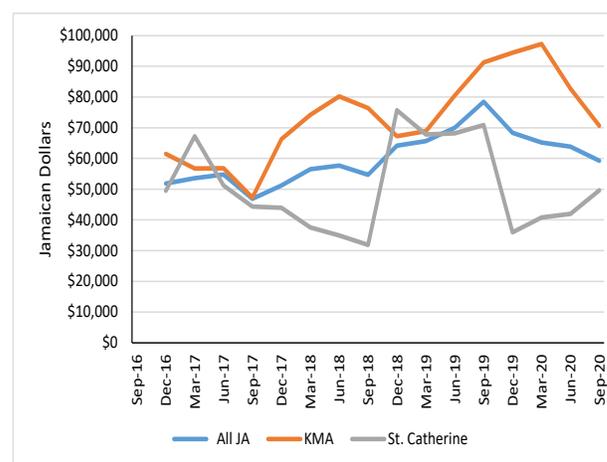


Figure 4.24 Average Price per Square Meter Commercial Properties (4 qtr moving average)



²⁰ Real estate investments include only on–balance sheet positions for the insurance companies.

²¹ DTIs are restricted from holding real estate for investment purposes, while equity investments are limited to 10.0 per cent of regulatory capital.

Figure 4.25 Investment in other assets for the Securities Dealers & Insurance Sector

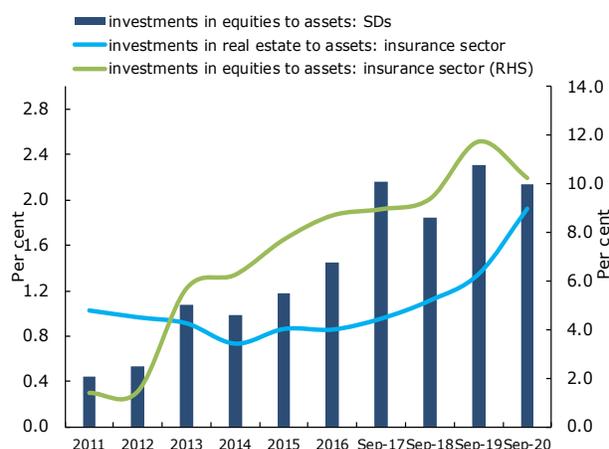


Table 4.3 Investment classes as a per cent of total assets pensions industry

	2015	2016	Sep-17	Sep-18	Sep-19	Sep-20
Investments in Governments Securities to Assets (%) ^{1/}	33.6	30.4	26.1	25.0	20.6	22.3
Investments in Equities to Assets (%)	14.6	17.0	20.3	23.8	26.3	21.6
Investments in Real Estate to Assets (%)	5.4	4.8	4.0	3.8	3.6	4.4
Investment Arrangements to Assets (%) ^{2/}	32.8	36.6	38.0	36.9	37.4	37.5
Other Investments to Assets (%)	13.2	11.1	11.5	10.7	12.2	0.6
Total Asset values (J\$BN)	396.9	453.1	513.3	595.1	690.0	639.8

Meanwhile, the JSE (Main) index declined by 27.9 per cent, over the same period. Against this background, NDTFIs' exposure to equities remained relatively low during the review period.²² Specifically, for securities dealers and insurance companies, the ratios of equity investments as a proportion of assets declined to 2.1 per cent and 10.2 per cent, respectively, at end-September 2020. The respective ratios were 2.3 per cent and 11.7 per cent at end-September 2019 (see **Figure 4.25**).

4.7 Pension industry exposure to government securities, equities & real estate²³

At end-September 2020, the pension industry continued to have the highest exposure to investment arrangements relative to other investment classes. However, the ratio of investment arrangements to assets for the pension industry was relatively unchanged at 37.5 per cent for the review period (see **Table 4.3**).^{24,25,26,27} At the close of the review period investments in government securities and equities accounted for 22.3 per cent and 21.6 per cent of total assets, respectively. This was in comparison to 20.6 per cent and 26.3 per cent, respectively, at end September 2019. The portfolio shift away from investments in equities toward safer investment classes could be attributed to the sharp decline in the equities market during 2020 as a result of the corona virus pandemic that affected investor confidence. For the review period, the pension fund industry's exposure to real estate and other investments increased marginally relative to end-September 2019.

²² Of note, DTIs' investment in equities has consistently been below 1.0 per cent of DTIs' assets base

²³ The data for the industry represents data for the pension fund as at end-September 2020.

²⁴ Investment arrangements consists of a pool of various investments including Deposits, Commercial Paper, Securities of Governments, Repurchase Agreements, Bonds and Debentures, Mortgages, Other Loans, Promissory Notes, Stocks and Shares, Real Estate, Derivatives and other investments

²⁵ Pension industry refers to private pension plans within the regulatory oversight of the Financial Services Commission.

²⁶ Exposure is computed as a per cent of total assets.

²⁷ Investment arrangements includes pooled funds and deposit administration contracts.

Box 4.1 Debt repayment capacity of non-financial companies listed on Jamaica Stock Exchange (JSE)

An assessment was conducted in order to examine the debt repayment capacity of Jamaican non-financial companies listed on the JSE over the two-year period (June 2018 to June 2020). Key performance ratios, specifically the return on equity (ROE), return on assets (ROA), debt to profit and debt to equity were assessed. The results demonstrated that these companies reflected significant vulnerabilities to debt exposure during the COVID-19 pandemic. Furthermore, there were increases in the debt to profit and debt to assets ratios for the review period. These increases were primarily due to debt increasing at a faster pace relative to profits and assets.

The forty-three non-financial companies examined accounted for 37.7 per cent of the share of the total market capitalization of the JSE main index, were examined in order to analyze their debt repayment capacity. The debt repayment capacity of a company refers to the amount of debt that it can incur and repay according to the terms of a debt agreement. Note that, a company acquires debt for several reasons which usually includes expanding capacity, or acquiring new businesses. As such, this assessment utilized the listed non-financial companies' balance sheets and income statements to calculate key financial metrics in order to estimate these companies' leverage.

Profitability

The profitability performance of the listed non-financial companies was examined, given that companies with higher profitability ratios would have higher retained earnings and are better able to repay debt. Specifically, the average return on equity ratio declined by

9.1 percentage points to 3.2 per cent for the June 2020 quarter relative to 12.3 per cent for the December 2019 quarter. This was primarily due to profits declining at a faster pace relative to equity, due to the ongoing impact of the COVID-19 pandemic. Of note, ROE declined by 0.9 percentage points for the two-year period (June 2018–June 2020). This notable decline in the ROE suggests that non-financial companies could become significantly vulnerable to their debt exposure in the event of a prolonged downturn in the business cycle.

Moreover, return on assets declined to 2.4 per cent for the June 2020 quarter from 5.5 per cent for the December 2019 quarter. Of note, over the two-year period (June 2018–June 2020), ROA fell by 0.2 percentage points. The decline in the ROA indicated that these non-financial companies have become less efficient in utilizing capital invested in assets to generate revenue.

Debt Repayment Capacity and Leverage

Overall, the debt repayment capacity of Jamaica's listed non-financial companies deteriorated over the review period, particularly since the onset of the pandemic. The outturn highlighted that these companies increased their reliance on debt as a source of funding.

A quarterly assessment of the non-financial listed companies demonstrated that the debt to profit ratio increased significantly to 1859.9 for the June 2020 quarter relative to 80.4 per cent for the December 2019 quarter (see Figure 1). The quarterly average debt to profit ratio increased due to a faster pace of growth in debt relative to profits. Of note, over the last two quarters of June 2020 twelve

non-financial companies realized losses over the review period. As such, the overall repayment capacity of the listed non-financial companies worsened over the two quarters ending June 2020. This performance implied a greater exposure to financial risk which emanated from increased debt repayment obligations (see **Table 1**). Further assessment of these institutions' balance sheets showed that as a group, these companies became more leveraged at end-June 2020 relative to end-June 2018.

Additionally, debt to assets ratio of the listed non-financial companies increased to 44.9 per cent for the June 2020 quarter relative to 4.4 per cent for the December 2019 quarter. This result demonstrated that a higher percentage of assets were being financed through debt. This significant increase indicated that the creditors have more claims on the company's assets. Furthermore, non-financial companies assessed became more exposed to increased insolvency risk and would also face increased difficulty in acquiring financing for any new projects that may arise.

In conclusion, the assessment showed that the non-financial companies listed on the JSE became significantly exposed to debt, especially following the onset of the COVID-19 pandemic. In general, the assessment identified risks to debt repayment capacity that could lead to further credit and default risks. Therefore, the materialization of these risks could disrupt financial system stability if the domestic economy continues to contract. In this regard, the BOJ should remain vigilant in monitoring these developments, especially given the current domestic financial conditions.

Table 1 Average Assets, Liabilities and Profit after Tax

Period	June 2020	December 2019
Profit After Tax	28,757,133.1	1,235,227,187.3
Assets	1,314,687,164.1	22,416,018,123.6
Liabilities	560,235,880.6	10,047,788,211.8

Figure 1 Debt repayment capacity for non-financial companies



5.0 RISK ASSESSMENT OF THE FINANCIAL SECTOR

This chapter discusses the resilience of the financial sector to hypothetical macroeconomic and financial shocks.

5.1 Overview

There was a deterioration in the macro-financial environment during 2020 due to the COVID-19 pandemic. These developments were observable in composite indices of domestic macro-financial conditions. On average, both the Aggregate Financial Stability Index (AFSI) and Macro Financial Index (MaFi) reflected weaker conditions. This downturn was mainly driven by a decline in the JSE Main Market index and slower growth in private sector credit. Furthermore, there was a deterioration in the quality of loans.

There were improvements in DTIs' average exposure to liquidity and foreign exchange risks for 2020. However, DTIs' average exposure to credit and interest rate risks increased. Notwithstanding, the DTI sector remained adequately capitalized to absorb shocks credit, liquidity and market risks.

NDTFI remained robust to the contemplated range of liquidity and foreign exchange shocks during the review period. However, in the context of the pandemic, the securities dealers' sector showed vulnerability to aggregated hypothetical shocks. Specifically, the sector continued to demonstrate susceptibility to interest rate risks due to fair value losses.

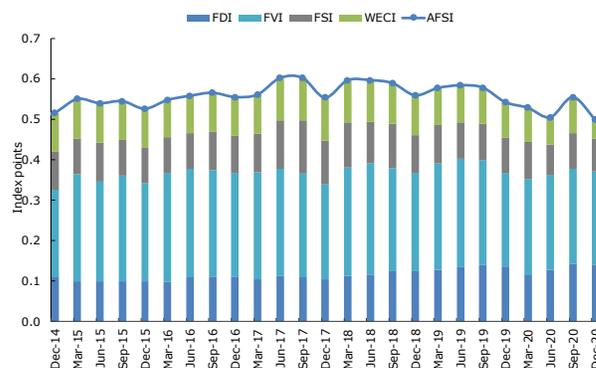
The pandemic also had an impact on the insurance sector as there were increased susceptibility to interest rate and foreign exchange appreciation shocks compared to end-September 2019.

5.2 Composite indicators

5.2.1 Macro-composite indicators of financial stability

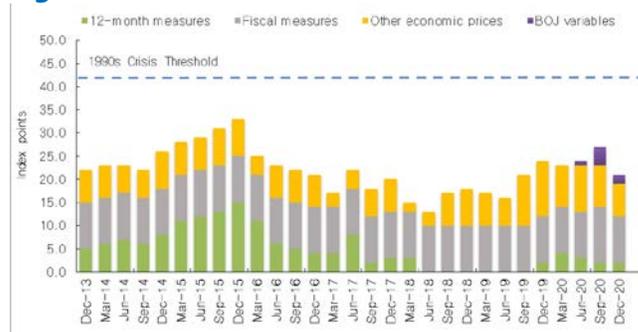
The Aggregate Financial Stability Index (AFSI) as well as the Macro Financial Index (MaFi), which are composite indicators of macro-financial

Figure 5.1 Aggregate financial stability index



Note: The AFSI aggregates microeconomic, macroeconomic and international factors to form a single measure of financial stability. A higher value indicates increased financial stability while a lower value indicates deterioration in financial sector stability. Of importance, microeconomic data captures information for DTIs. FDI – Financial Development Index, FVI – Financial Vulnerability Index, FSI – Financial Soundness Index, WECl – World Economic Climate Index

Figure 5.2 Macro-financial index

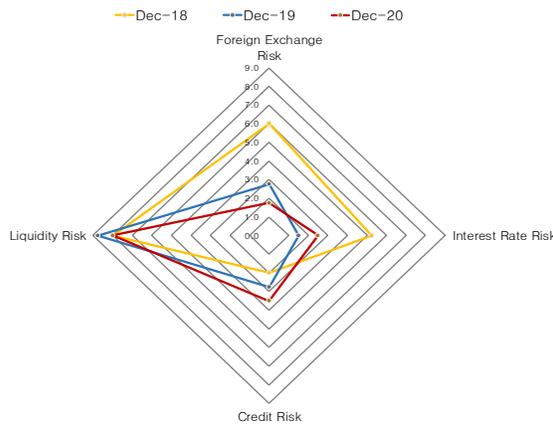


Note: The MaFi & MiPI are signal-based indices computed using scores for indicators based on the number of standard deviations of each indicator from its 'tranquil period' mean value. The tranquil period for both indices spans the period March 2002 to March 2003. The scores range from 0 to 5 with a score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

Figure 5.3 Micro-prudential index for DTIs

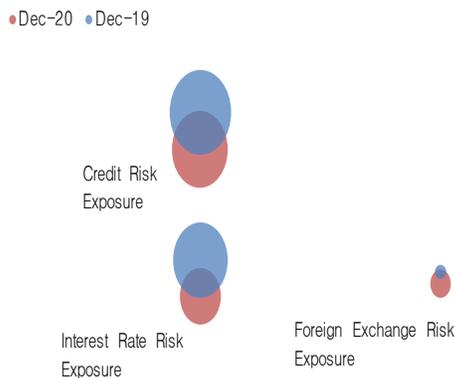


Figure 5.4 Risk exposures of DTIs



Note: Movements away from the centre of the diagram represent an increase in DTIs’ risk exposures. Movements towards the centre of the diagram represent a reduction in DTIs’ risk exposures. Risk exposure indicators are: (i) Foreign exchange risks – Net open position/Capital; Loans to Non-FX earners/Total FX loans (ii) Interest rate risks – Cumulative maturity gap of up to 30 days/Assets; Cumulative maturity gap of up to 90 days/Assets; Cumulative maturity gap of up to 365 days/Assets; DVBP/Capital (iii) Credit Risks – NPL/Total loans (iv) Liquidity risks – Liquid assets/Total assets; Liquid assets/Short-term liabilities

Figure 5.5 Relative exposures of DTIs based on scenarios examined in aggregate stress test analysis



Note: The larger the bubble, the greater the exposure to risk factors. The aggregate stress test assesses the simultaneous impact of increases in interest rates, currency depreciation and credit quality deterioration as well as deposit outflows on institutions’ CARs. The size of each node is scaled in proportion to the total value of exposure arising from scenarios involving credit risk (100.0 per cent of past due performing loans (0–3 months) becoming non-performing), foreign exchange risk (10.0 per cent depreciation in the JMD/USD exchange rate) and interest rate risk (1100 bps/100 bps & 100 bps/10 bps increase in interest rates on domestic/foreign rate sensitive assets and liabilities, respectively).

conditions, showed mixed results for 2020.¹ Specifically, the quarterly average for the AFSI was 0.5 at end-2020 relative to 0.6 at end-2019 (see **Figure 5.1**). The Macro-Financial Index (MaFI), increased to 28 points at end-2020 relative to 23 points at end-2019 (see **Figure 5.2**).

The deterioration in the macro-financial index was largely due to declines in the JSE Main Market index and slower growth in private sector credit. Of note, the MaFI remained well below the 1996–1998 financial crisis threshold value of 44.0 points.

The financial soundness, financial development and world economic climate sub-components of the AFSI declined slightly for the review period while the financial vulnerability sub-component was relatively unchanged. Though there were positive developments in the credit environment and a narrowing of the interest rate spreads, the decline in GDP and reduced stock market capitalization resulted in an unfavourable outturn in the financial development sub-component. The deterioration in the financial soundness and world economic climate sub-components of the AFSI was due to an increase in the non-performing loans (NPL) to total loans ratio of DTIs as well as the economic downturn.

5.2.2 Micro-composite indicators of financial stability²

The micro-prudential Index (MiPI), a composite indicator based on financial institutions’ operations, decreased to 23.0 points as at end-December 2020 from 25.0 points at end-December 2019. Notably, the MiPI remained far below the 1996–1998 financial crisis threshold value of 50.0 points (see **Figure 5.3**). The outturn in the MiPI was positively impacted by deposits

¹ See: Morris, V., Measuring and Forecasting Financial Stability: The Composition of an Aggregate Financial Stability Index for Jamaica, 2010. http://boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_Measuring_and_Forecasting_Financial_Stability_The_Composition_of_an_Aggregate_Financial_Stability_Index_for_Jamaica.pdf

² The MiPI is an early warning composite indicator. The current period value of various indicators is compared relative to tranquil period mean values. The number of standard deviations away from the mean is then used to assign risk scores of 1–5.

and repos to total assets, resulting in an improvement in the quarterly signal for the balance sheet structure category. Further, the impact of this performance offset the worsening in the asset quality category, attributable to the deterioration of non-performing loans to total assets for the review period, while the profitability category was relatively unchanged.³

5.3 Risk exposure assessment for deposit taking institutions

DTIs' exposure to financial risks was generally mixed during 2020. More specifically, the financial risk exposure "cobweb" which measures annual average exposure to financial risks showed that there was deterioration in DTIs'

exposure to credit risk and interest rate risks, as measured by non-performing loans to total loans and cumulative maturity gaps, respectively. Notably, there was a reduction in DTIs' exposure to liquidity and foreign currency risks relative to the previous review period (see **Figure 5.4**).

The results of DTIs' aggregate stress tests showed that the sector was more resilient to hypothetical shocks applied at end-2020. These results were largely due to a reduction in DTIs' exposure to past due loans and loss to interest income.

However, DTIs' exposure to foreign exchange risks increased, largely due to the depreciation of the Jamaica Dollar against the US dollar. Notwithstanding, DTIs remained resilient to hypothetical interest rate, liquidity, foreign exchange and credit shocks at end-2020 (see **Figure 5.5**).

5.4 Liquidity funding risk assessment for deposit-taking institutions

There was improvement in Jamaica Dollar liquidity conditions during 2020. As such, DTIs' exposure to domestic currency liquidity risks declined during the year. In particular, DTIs'

Figure 5.6 Trends in the liquid asset ratio and excess reserves in liquid assets

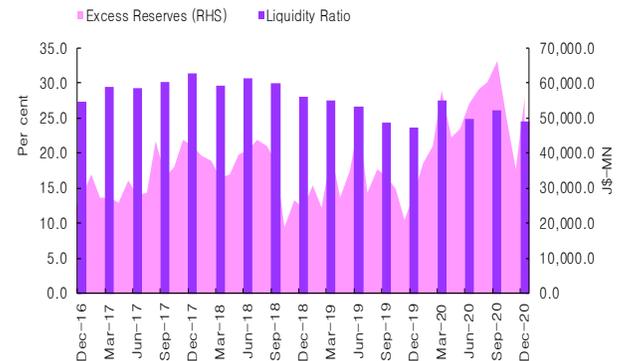


Figure 5.7 The ratio of assets maturing within 3 – months to liabilities maturing within 3 – months for DTIs

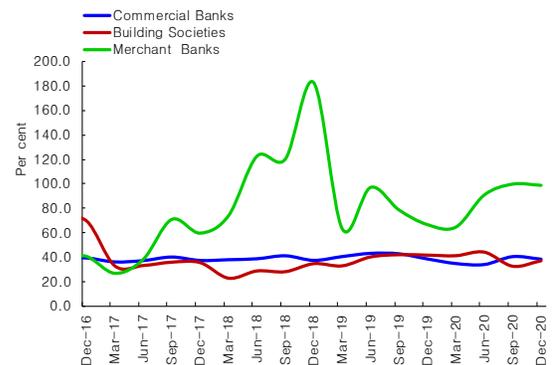
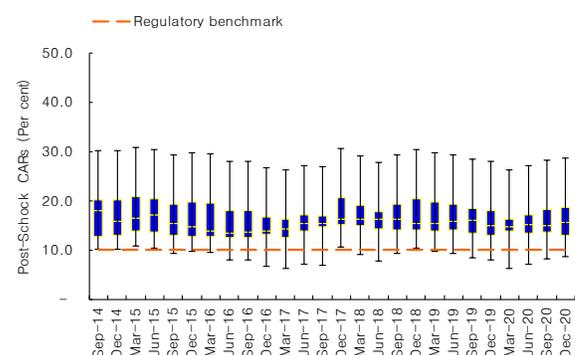


Figure 5.8 Distribution of liquidity funding risk stress test results for DTIs (10.0 per cent decline in average deposits)



³ The "other" component is made up of FX liabilities/Assets, FX Deposits/FX Assets and 12-month growth in deposits.

Figure 5.9 Liquidity funding risk stress test results for DTIs⁴

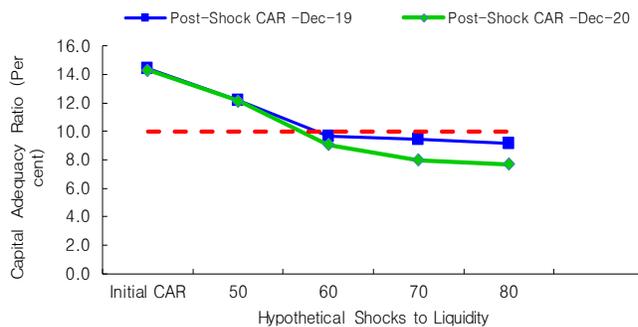


Figure 5.10 DTIs’ domestic currency and foreign currency investment holdings as a ratio to total investments

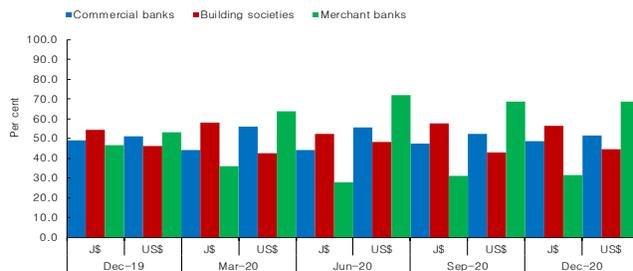
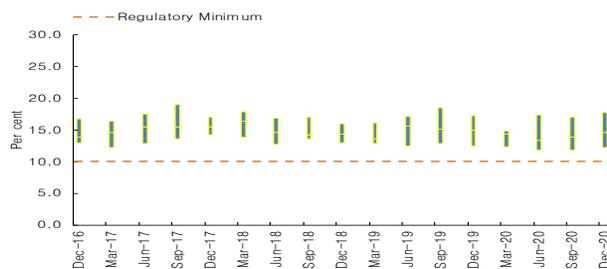


Figure 5.11 Interquartile range for post-shock CARs due to hypothetical interest rate shocks to DTIs (impact on CAR of 1100 bps/ 100 bps & 275 bps/ 15 bps shock to interest rates)⁵



⁴ Liquidity stress test results show DTIs post shock CARs following declines in deposits.

⁵ A shock of 1100 bps and 100 bps was applied to the domestic securities portfolio and the domestic deposits & loan portfolio, respectively. A shock of 275 bps and 15 bps was applied to the foreign securities portfolio and the foreign deposits & loan portfolio, respectively.

liquidity ratio as measured by liquid assets to average prescribed liabilities increased by 0.8 percentage point to 24.5 per cent at end-2020, relative to 23.7 per cent at end-2019. Notably, the dollar value of DTIs’ excess reserves was above the levels recorded at the end-2019 (see **Figure 5.6**).

There was improvement in the ratio of short-term assets to short-term liabilities for the merchant bank sub-sector (see **Figure 5.7**). On the other hand, the ratios for the commercial bank and building societies’ sub-sectors decreased by 0.2 percentage point and 4.5 percentage points to 38.5 per cent and to 37.2 per cent, respectively. Additionally, the loan-to-deposit ratio for the DTI sector increased marginally by 4.0 percentage points to 75.6 per cent at end-2020, and was indicative of DTIs’ continued viability in meeting short-term liquidity needs.

As it pertains to funding sources, deposits as a proportion of total funding increased to 67.6 per cent at end-2019 from 64.8 per cent at end-2019. In contrast, ‘repos’ as a share of total funding decreased to 4.7 per cent from 5.1 per cent. Concurrently, ‘other funding’ liabilities as a share of total funding was 6.2 per cent at end-2020 relative to 6.5 per cent at end-2019.

DTIs funding risk stress tests results, showed that all DTIs were adequately capitalized to absorb losses associated with hypothetical declines in deposits as at end 2020. For instance, following a hypothetical decline of 10.0 per cent in average deposits, the post-shock CARs for all DTIs were above the regulatory minimum of 10.0 per cent.⁶ As such, there was an increase in the interquartile range of post-shock CARs for the system during the review period ending 2020. In particular, as at end-2020, it would take a hypothetical withdrawal of 55.0 per cent of deposits to breach the statutory

⁶ The scenarios assume that DTI assets are sold with the following ‘hair cuts’ (per cent loss in value): items in course of collection (10.0 per cent), non-liquid investments (25.0 per cent), accounts receivables (25.0 per cent), loans & advances (25.0 per cent), fixed assets (50.0 per cent) and other assets (50.0 per cent). Further funding needs are then written off against the capital buffers and statutory capital.

benchmark of 10 per cent compared to 57.0 at end-2019 (see Figures 5.8 & 5.9).

5.5 Market risk assessment of deposit-taking institutions

There was a marginal increase in the Jamaica Dollar value of foreign currency securities held by DTIs during the review period, as DTIs adjusted portfolios within the context of the depreciation of the domestic currency (see Figure 5.10). In particular, foreign currency securities as a share of total investments remained unchanged at end-2020.

Moreover, commercial banks and building societies total foreign investments as a share of total investments decreased to 54.1 per cent and 44.3 per cent respectively, at end-2020 relative to 51.1 per cent and 46.1 per cent at end-2019.

At end-2020, in response to hypothetical interest rate shocks, DTIs' remained resilient with the sector's CAR remaining above the 10.0 per cent prudential minimum. the previous review period in 2019 (see Figure 5.13).⁷

The DTI sector remained generally resilient to hypothetical depreciations of the Jamaica Dollar vis-à-vis the U.S. dollar at end-December 2020. In response to a 30 per cent depreciation of the domestic currency, the average median post-shock CAR across all DTIs decreased to 13.1 per cent at end-2020 relative to 15.0 per cent at end-2019. Moreover, DTIs also remained resilient to all the hypothetical appreciation shocks (see Figure 5.14)⁸.

Figure 5.12 Quarterly ratio of DTI NOP to tiered capital

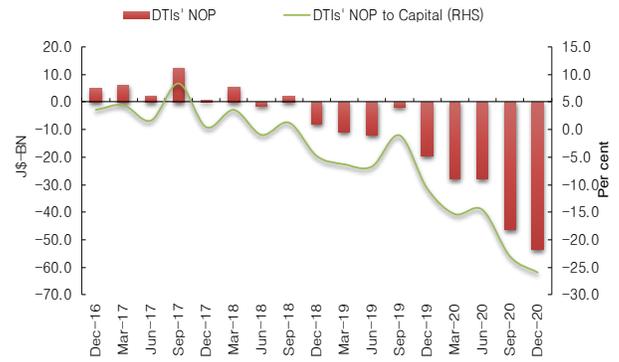


Figure 5.13 Analysis of foreign currency loans to non-foreign currency earners for DTIs

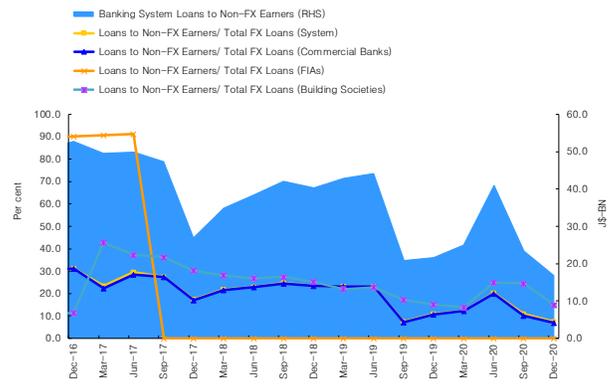
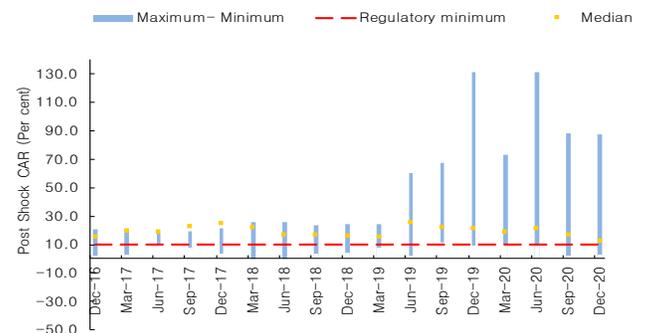


Figure 5.14 Distribution of foreign exchange risk stress test results for DTIs (impact on CAR of 30.0 per cent depreciation)



⁷ Foreign exchange stress test assessments include an increase in NPLs and the associated 100.0 per cent provisioning for foreign currency loans to non-FX earners.

⁸ Shocks are applied first to the exchange rate between the Jamaica Dollar and the US dollar. The corresponding exchange rates of the Jamaica Dollar vis-à-vis the Euro, the Canadian dollar, and the Pound Sterling are then incorporated based on historical correlations with the selling rate for the US dollar between the January and May 2003 foreign exchange crisis period.

Figure 5.15 NPL coverage ratios for DTIs and write-off rates for NPLs for commercial banks

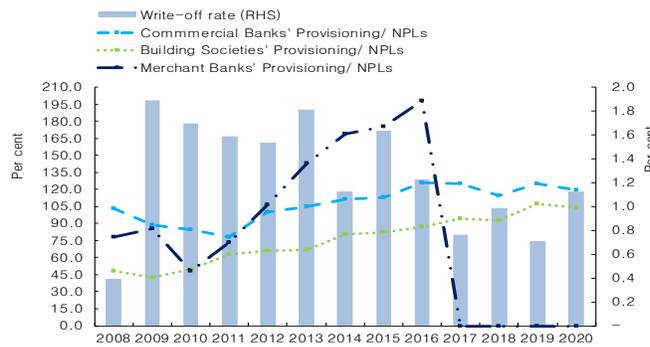


Figure 5.16 Credit risk stress test results for DTIs (Scenario: Impact on CAR of a 30% increase in NPLs)⁹

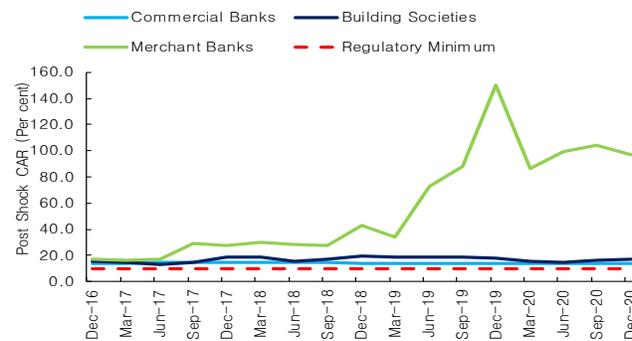
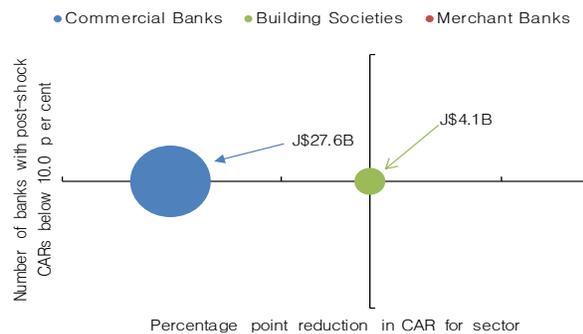


Figure 5.17 Credit risk exposure for DTIs at end-September 2018 (scenario: 100.0 per cent write-off of past due loans less than 3 months)¹⁰



5.6 Credit risk assessment of deposit taking institutions

DTIs' asset quality, as measured by the ratio of NPLs to total loans, increased marginally to 2.8 per cent at end-2020 relative to 2.2 per cent at end-2019. This slight deterioration in loan quality occurred within the context of the significant contraction in the Jamaican economy due to the COVID-19 pandemic. Of note, commercial banks' NPL ratio remained unchanged at 2.2 per cent at end-2020 when compared to end-2019. At the same time, building societies loan quality ratio slightly worsened to 2.7 per cent from 2.3 per cent at the end of the previous review period. The deterioration in DTIs' asset quality reflected growth in NPLs of 41.9 per cent at end-2020 relative to 4.1 at end-2019. Of note, the CAR of all DTIs' remained above the prudential benchmark, in response to the aforementioned interest rate shocks (see **Figure 5.11**).

As it relates to foreign exchange risk for DTIs', at end-2020, the sector recorded a short position of \$55.1 billion, relative to a short position of \$19.3 billion at end-2019 (see **Figure 5.12**).¹¹ The NOP to capital ratio for the DTI sector was -26.0 per cent at end-2020 relative to -10.8 per cent at end-2019. Furthermore, loans to non-foreign exchange earners as a proportion of total foreign currency loans increased to a quarterly average of 7.5 per cent for the review to 7.4 per cent for

Due to the greater than proportional increases in NPLs relative to provisions, the NPL coverage ratios for both the commercial banking and building societies subsectors declined. The NPL coverage ratio for the commercial banking subsector, as measured by total provisioning as a share of total NPLs, decreased to 119.6 per cent at end-2020 from 125.3 per cent at end-2019. Furthermore, commercial banks' loan write-offs as a share of total loans, increased to 1.1 per cent at end-2020 from 0.7 per cent at end-2019. (see **Figure 5.15**).¹² The NPL coverage

⁹ The post shock CAR increased as the merchant bank sector has zero nonperforming loans, as such the initial CAR is equal to the post shock CAR.

¹⁰ No institution's CAR fell below the prudential minimum.

¹¹ Net open position in foreign currency assets include all currencies converted to US dollars.

¹² The merchant banking sector had no NPLs as at December 2020. As such, there was no impact on the sub-sector's CAR subsequent to a hypothetical increase in NPLs.

ratio for the building societies sub-sector also declined to 104.0 per cent at end-2020 from the 107.2 per cent recorded at the close of the previous review period.

At end-2020 the maximum ratio of NPLs to capital within the DTI sector increased to 43.1 per cent from 21.5 per cent at end-2019. Also, there was a continued narrowing of the inter-quartile range of NPLs to capital for the DTIs sector which reflected lower exposure to credit risk for three institutions. The ratios were within an inter-quartile range of 9.4 per cent to 43.1 per cent at end-2020 relative to the range of 7.7 per cent to 21.5 per cent at end-2019.

In addition, stress test results at end-2020 showed that each DTI sub-sector was adequately capitalized to absorb hypothetical shocks of a 30.0 per cent increase in NPLs. Of note, there was a marginal deterioration in NPLs to hypothetical increases in NPLs which was largely due to a decline in loan quality for the review period. In response to the hypothetical scenarios, post-shock CARs for the commercial bank sub-sector marginally declined. (see **Figure 5.16**).

In response to a hypothetical shock in which 100 per cent of past due loans become non-performing, commercial banks and building societies NPLs increased to \$27.6 billion and \$4.1 billion respectively, at end-2020. In response to a similar scenario at end 2019 the commercial banking and building societies sub-sectors' NPLs would have increased to \$33.0 billion and \$4.9 billion, respectively. (see **Figure 5.17**).

At end-2020, reverse stress testing results showed that the DTI sub-sector remained generally robust when hypothetical shocks which ranged between 200.0 per cent and 450.0 per cent were applied to NPLs. In particular, it would take a hypothetical increase of 259.0 per cent in NPLs at end 2020 for the CAR of the DTI sector to fall below CAR benchmark of 10.0 per cent. In comparison, at end-2019 it would require an

Figure 5.18 Magnitude of shock required for most vulnerable DTI to breach 10.0 per cent benchmark

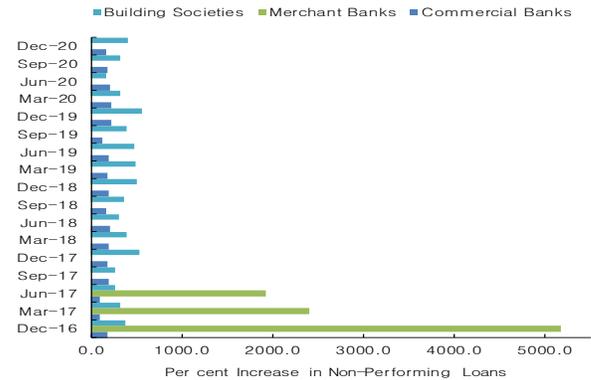


Figure 5.19 Impact on DTIs' CAR from an increase in NPLs

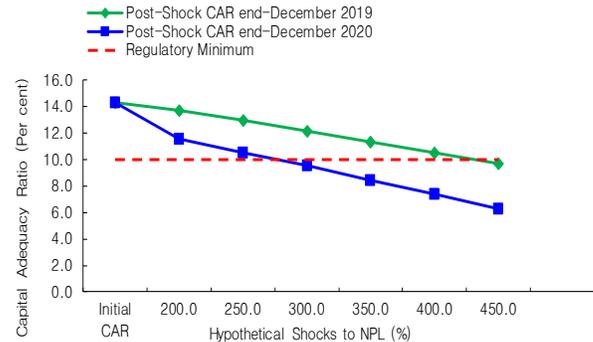
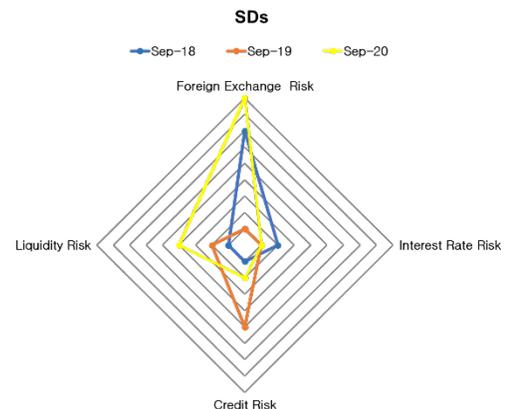


Figure 5.20 Evolution of risk exposure indicators for the 12 largest securities dealers



Note: Risk exposure indicators: (i) Credit Risk – NPLs/Loans (ii) Interest Rate Risk – Cumulative maturity gap < 30 days, < 90 days, < 360 days/Assets, DVBP/Capital (iii) Foreign Exchange Risk – NOP/Capital (iv) Counterparty Risk – Gross exposures to DTIs/Capital (v) Liquidity Risk – Liquid assets/total assets, liquid assets to short-term liabilities

Figure 5.21 Impact of scenario based aggregate stress tests on securities dealers' CARs

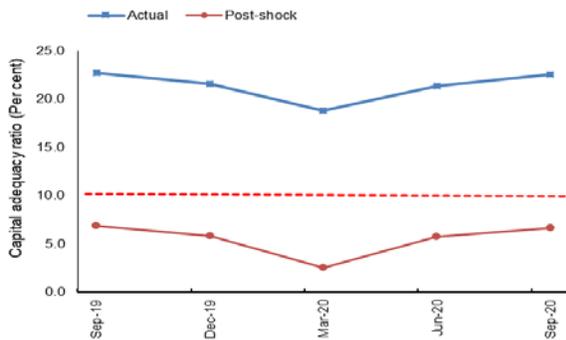


Figure 5.22 Liquidity funding risk stress test results for securities dealers (scenarios: 10.0 per cent to 50.0 per cent decline in retail repo-liabilities)

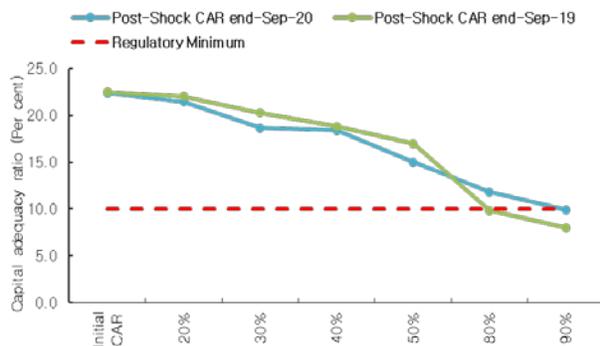
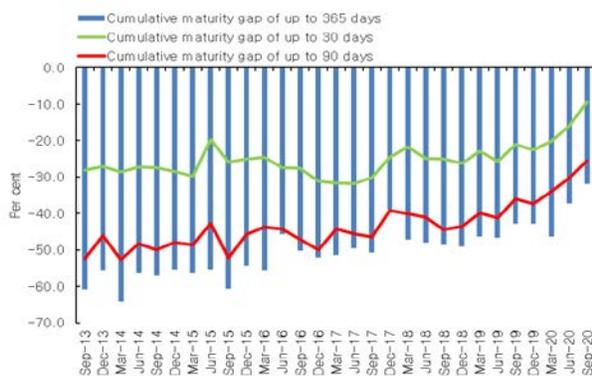


Figure 5.23 Cumulative gap to asset positions – securities dealers¹³



¹³ Cumulative maturity gaps are defined as the difference between maturing assets and liabilities up to a certain time bucket. They are used to examine the mismatch between maturing assets and liabilities and hence susceptibility to interest rate and liquidity risks

increase in NPLs of 421.0 per cent for the sector to breach the prudential minimum CAR (see **Figures 5.18 and 5.19**).^{14,15}

5.7 Risk exposure assessment for securities dealers

There was mixed response in the securities dealers' sector response to all assessed average quarterly risk exposures for the year-ended September 2020 relative to end-September 2019 (see **Figure 5.20**).¹⁶ In particular, the securities dealers' exposure to foreign exchange risks worsened due to a marked increase in the NOP to capital ratio. There was also an increase in liquidity risk exposure due to a decline in securities dealers' average quarterly liquid assets positions. However, there was an improvement in the credit risk dimension due to a decrease in the NPLs to total loans ratio.

Given the mixed results in securities dealers' average risk exposures and also within the context of the global pandemic, the results of the aggregate stress test at end-September 2020 deteriorated relative to the performance at end-September 2019.¹⁷ Of note, vulnerability was highest in the March 2020 quarter. This deterioration was largely reflective of continued susceptibility to interest rate risk (see **Figure 5.21**).

¹⁴ Reverse stress testing involves identifying the increase in NPLs required to bring the weakest institution's CAR below the 10.0 per cent minimum benchmark.

¹⁵ The merchant banking sub-sector had zero NPLs and as a result no reverse stress testing was applied.

¹⁶ The analysis is based on a representative sample of twelve securities dealers.

¹⁷ Aggregate stress test assumptions include: i/ 1100 bps and 100 bps increases in domestic interest rates on investment assets & liabilities and other assets & liabilities, respectively. ii/ 100 bps and 10 bps increases in foreign currency interest rates on investment assets & liabilities and other assets & liabilities, respectively. iii/ 10.0 per cent depreciation in the JMD/USD exchange rate. iv/ 100.0 per cent of past due performing loans (0 – 3 months) becoming non-performing. v/ 10.0 per cent reduction in deposits or repurchase liabilities.

5.8 Liquidity funding risk assessment of securities dealers

Stress test results, based on data at end-September 2020, showed that securities dealers continued to be resilient to hypothetical reductions in repo liabilities.¹⁸ Reverse stress testing revealed that a decline of 91.0 per cent in retail repo liabilities would result in the sector's CAR falling below 10.0 per cent, albeit, comparing favourably to the result at end-September 2019 (see **Figure 5.22**).¹⁹ This result occurred within a context of a slight uptick in the sector's holdings of repo liabilities to approximately 18.0 per cent at end-September 2020 from 16.0 per cent of total liabilities at end-September 2019.

Key liquidity indicators for the securities dealers' sector showed mixed results for the year ended September 2020. Specifically, the ratio of liquid assets to total assets decreased to a quarterly average of 16.3 per cent from a quarterly average of 16.9 per cent for the year-ended September 2019.²⁰ However, there was a narrowing of the cumulative 30-day and 90-day maturity gaps between interest sensitive assets and liabilities (see **Figure 5.23**). Furthermore, the ratio of short-term assets (less than three months) to short-term liabilities increased to a quarterly average of 47.8 per cent from 40.1 per cent for the year-ended September 2019. In addition, the foreign currency short-term assets to short-term liabilities ratio improved to a quarterly average of 38.9 per cent for the year-ended September 2020 from a quarterly average

¹⁸ The current definition of retail repos in the liquidity funding risk assessment is a proxy as it is a much broader measure than actual retail repos. This broader definition is based on the type of client, that is, individual or non-financial clients, and not on the treatment of the securities.

¹⁹ The scenarios assume that securities dealers' assets are sold with the following 'hair cuts' (per cent loss in value): non-liquid investments (25.0 per cent), accounts receivables (25.0 per cent), loans & advances (25.0 per cent), fixed assets (50.0 per cent) and other assets (50.0 per cent). Further funding needs are then written off against the capital buffers and statutory capital

²⁰ Liquid Assets for securities dealers comprise: i) Liquid funds ii) BOJ securities iii) GOJ T-Bills iv) Eligible locally registered GOJ stocks v) Other eligible GOJ securities and vi) Eligible liquid assets from other counter-parties.

Figure 5.24 The ratio of assets maturing within 3-months to liabilities maturing within 3-months for securities dealers

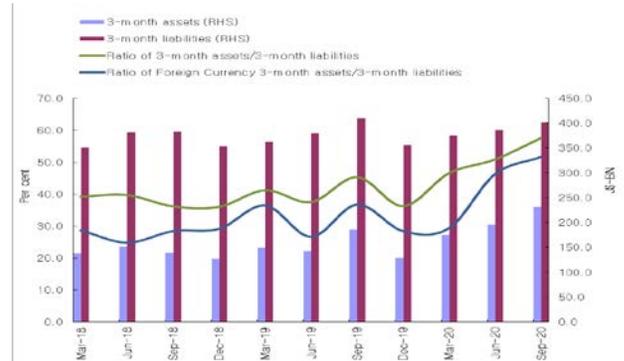


Figure 5.25 Interest rate stress test results – securities dealers²¹

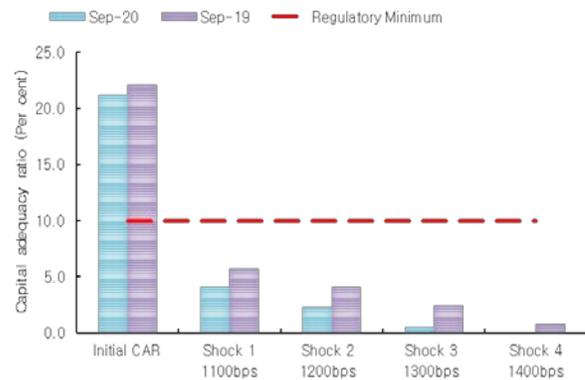
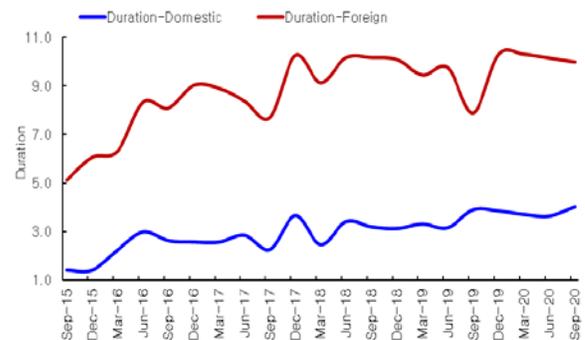


Figure 5.26 Evolution of duration for domestic and foreign securities for top 12 largest securities dealers



²¹ The scenarios examined include: Increases of 1100 bps/100 bps & 275 bps/15 bps, 1200 bps/200 bps & 300 bps/30 bps, 1300 bps/300 bps & 325 bps/50 and 1400 bps/400 bps & 350 bps/70 bps in interest rates on domestic/foreign rate sensitive assets and liabilities.

Figure 5.27 Duration gap vs. percentage point change in CAR after a 1100bps/100bps interest rate shock at end-September 2020²²

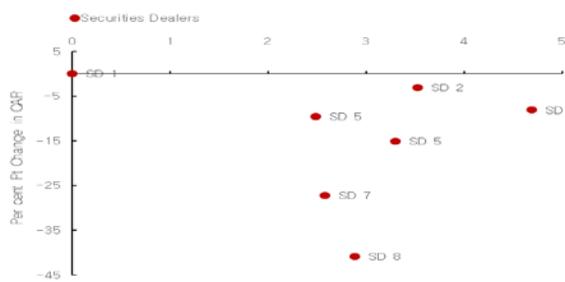


Figure 5.28 Foreign exchange risk stress test results – securities dealers (scenarios: Impact on CAR of 10.0 per cent to 50.0 per cent depreciation)

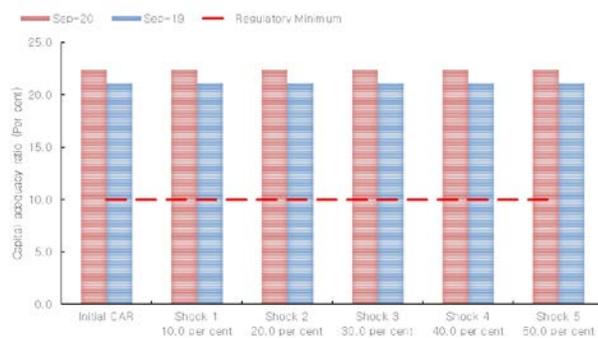
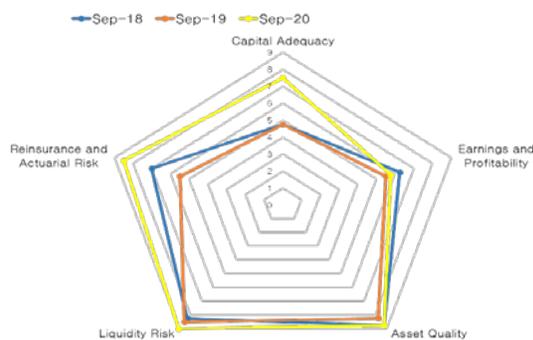


Figure 5.29 Evolution of risk exposures – general insurance sub-sector



Note: Core FSI indicators: (i) Capital Adequacy – MCT, Capital/Assets, Capital/Technical Reserves (ii) Earnings & Profitability – ROE, Operating expenses/Net premium, Investment income/Investment Assets (iii) Asset Quality – Receivables to gross premiums, Equities/Total Assets, real estate + accts receivables to TA (iv) Liquidity – Liquid assets/Total Assets (v) Sensitivity to market risks – Duration of assets and liabilities (domestic bonds), Duration of assets and liabilities (global bonds) (vi) Reinsurance & Actuarial Issues – net premium to gross premium, net tech. reserves to net claims

²² Graph includes the securities dealers that are most severely impacted

of 32.2 per cent for the previous review period (see Figure 5.24).

5.9 Interest rate risk assessment of securities dealers

The securities dealers sector showed increased vulnerability to hypothetical but plausible interest rate shocks which involved increases of 1100 bps/100 bps & 275 bps/15 bps on domestic rate sensitive assets and liabilities and foreign rate sensitive assets and liabilities, respectively. In response to these shocks, the sector's CAR declined to 4.1 per cent at end-September 2020 from 5.7 per cent at end-September 2019 (see Figure 5.25). The weaker performance of the securities dealers as at end-September 2020 was mainly attributable to higher fair value losses as a result of increases in domestic investment durations (see Figure 5.26). Furthermore, securities dealers remained susceptible to interest rate risk due to the significant gap between the duration on the asset and liability portfolio at end-September 2020 (see Figure 5.27).

5.10 Foreign exchange risk assessment of securities dealers

At end-September 2020, the securities dealers' sector remained resilient to hypothetical exchange rate shocks despite an expansion of the NOP.²³ Specifically, these institutions were resilient to hypothetical depreciations and appreciations of 10.0 to 50.0 per cent in the exchange rate (see Figure 5.28). Of note, following a hypothetical appreciation of 50.0 per cent in the exchange rate, the CAR for the sector declined by 2.3 percentage points to 20.1 per cent. This was in comparison to a decline of 4.1 percentage points to a post-shock CAR of 17.0 per cent at end-September 2019 following a similar shock. The sector's capital adequacy remained above the prudential minimum given the strong level of capitalization.

²³ The NOP to capital ratio for the securities dealers increased to 46.9 per cent at end-September 2020 from 11.0 per cent at end-September 2019.

5.11 Evolution of risk indicators – life and general insurance companies

The cobweb map of risk exposures for general insurance companies showed an overall deterioration relative to end-September 2019. There was an increase in the exposures to all risk dimensions (see **Figure 5.29**). In particular, the decline in asset quality mainly reflected the impact of increases in the receivables to gross premiums ratios, while the worsening in the

reinsurance & actuarial risk dimension largely reflected the impact of a weakening in the net premium to gross premium ratio. The weakening in capital adequacy dimension was attributable to a reduction in all capital ratios, specifically, the MCT. Nevertheless, the earnings & profitability dimension was relatively unchanged for the review period.

As it relates to the life insurance sub-sector, there was deterioration across the capital adequacy and liquidity dimensions for the review period (see **Figure 5.30**). However, there were improvements in the reinsurance & actuarial issues, earnings & profitability and asset quality dimensions, reflecting increases in net technical reserves, return on equity and equities to total assets, respectively.

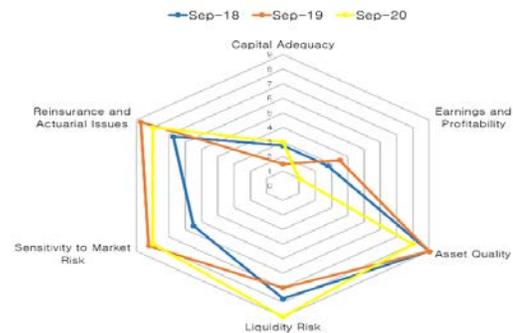
5.12 Foreign exchange risk assessment of life insurance companies

The life insurance sub-sector was resilient to hypothetical appreciations of the exchange rate at end-September 2020 as most institutions reduced their significant net long positions. The sub-sector's MCCR was above the prudential benchmark up to the most severe hypothetical shock of 50.0 per cent (see **Figure 5.31**).

5.13 Interest rate risk assessment of insurance companies

The application of the most severe interest rate shock to the life insurance sub-sector at end-September 2020, which involved increases of 1400 bps/400 bps & 350 bps/70 bps in interest

Figure 5.30 Evolution of risk exposures – life insurance sub-sector



Note: Core FSI indicators: (i) Capital Adequacy – MCCR, Capital/Assets, Capital/Technical Reserves (ii) Earnings & Profitability – ROE, Operating expenses/Net premium, Investment income/Investment Assets (iii) Asset Quality – Receivables to gross premiums, Equities/Total Assets, real estate + accts receivables to TA (iv) Liquidity – Liquid assets/Total Assets (v) Sensitivity to market risks – Duration of assets and liabilities (domestic bonds), Duration of assets and liabilities (global bonds) (vi) Reinsurance & Actuarial Issues – net premium to gross premium, net tech. reserves to net claims

Figure 5.31 Foreign exchange risk stress test results – life insurance sub-sector (scenarios: Impact on CAR of 10.0 per cent to 50.0 per cent appreciation)

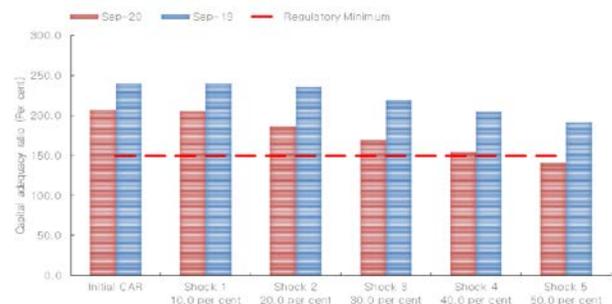
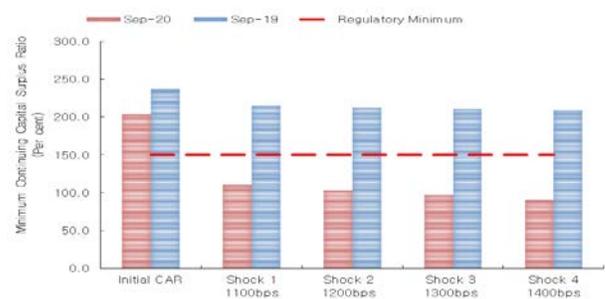


Figure 5.32 Interest rate risk stress tests for the life insurance sub-sector²⁴



²⁴ The scenarios examined include: Increases of 1100 bps/100 bps & 275 bps/15 bps, 1200 bps/200 bps & 300 bps/30 bps, 1300 bps/300 bps & 325 bps/50 bps and 1400 bps/400 bps & 350 bps/70 bps in interest rates on domestic/foreign rate sensitive assets and liabilities

Figure 5.33 Liquidity funding rate risk stress test results for the insurance sector (scenario: Impact on CAR of 10.0 per cent decline in liquid liabilities)

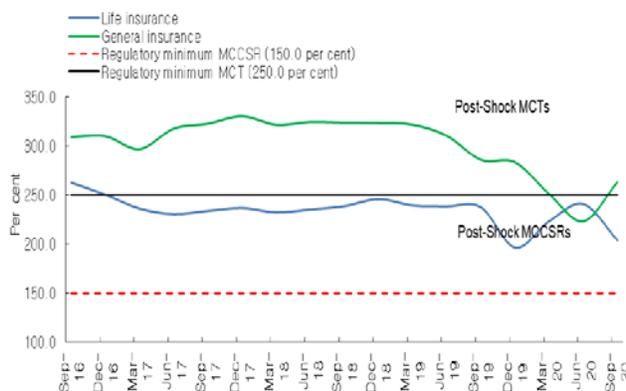


Figure 5.34 Impact of scenario based aggregate stress tests on the life insurance sub-sector’s MCCR

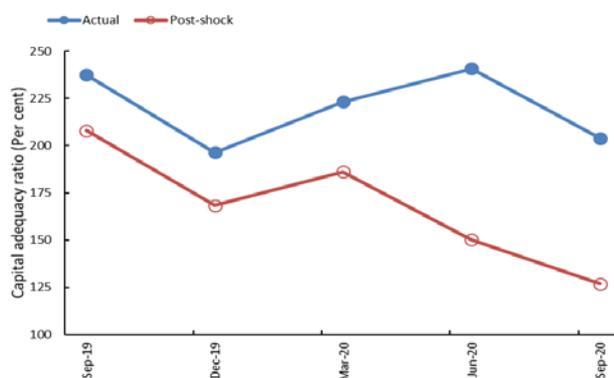
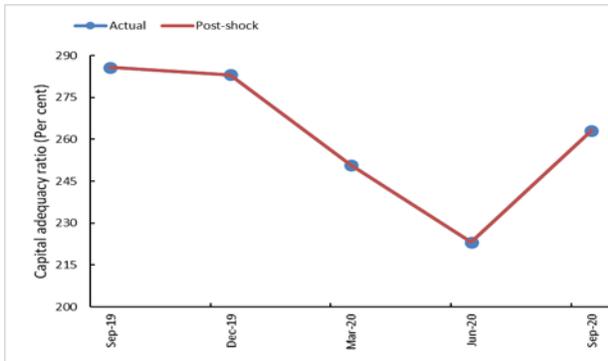


Figure 5.35 Impact of scenario based aggregate stress tests on the general insurance sub-sector’s MCT



rates, the capital ratio breached the regulatory minimum at 90.2 per cent. The sub-sector was vulnerable to even the least severe shock due to higher net interest income losses by life insurance companies during the review period (see Figure 5.32).

5.14 Liquidity funding risk assessment of insurance companies

There was an overall decline in the capital positions for the insurance sector for the review period. Additionally, there were further increases in liquid asset holdings during the review period. Notwithstanding, the life and general insurance sub-sectors showed continued robustness to hypothetical shocks to liquid liabilities. In response to a hypothetical 10.0 per cent loss of liquid liabilities, the MCCRs of life insurance companies remained above the prudential benchmark at 216.0 per cent at end-September 2020, albeit, lower than the 240.3 per cent which obtained at end-September 2019 (see Figure 5.33).

The post-shock MCT for the general insurance sub-sector was also well above the prudential benchmark despite a decline year-over-year. The quarterly average post-shock MCT for general insurance companies was 255.1 per cent relative to a quarterly average of 310.2 per cent for the previous review period.

Aggregate stress test results for the insurance sector showed post-shock capital ratios being materially impacted in the global pandemic and at times fell below the respective prescribed statutory benchmarks (see Figures 5.34 & 5.35). Of note, the life insurance sub-sector was largely impacted by a hypothetical shock involving a loss of 10.0 per cent in liquid liabilities.

6.0 Interconnectedness and Spillover Risks

This chapter examines the results of network analysis conducted on entities' gross funding exposures vis-à-vis other financial entities and the financial network based on the Real Time Gross Settlement payment system.

6.1 Overview

Contagion and spillover risks declined for the review period ended-September 2020, as the COVID-19 pandemic led to a reduction in the value of financial positions vis-à-vis other financial entities. The commercial banking and securities dealer sectors were the most significant contributors to gross funding in the financial system over the review year. Of note, securities dealers and DTIs continued to have significant funding exposures with all other financial sectors. There was a slight decline in the systemic risk score for the review period, indicating a reduction in the risk of contagion within the financial system. Despite the reduction in the risk of contagion, the financial system remained highly interconnected and vulnerable.

Network analysis identified seven clusters, wherein each cluster was generally made up of entities of the same financial holding company. Financial group analysis also emphasised the critical role that holding companies continue to play in the domestic financial system. The commercial banking sector continued to be the dominant sector within the JamClear®-RTGS payment network. The COVID-19 pandemic has left DTIs and securities dealers more susceptible to hypothetical credit and funding shocks

Figure 6.1 Network of gross credit exposures between DTIs and SDs at end-September 2020¹

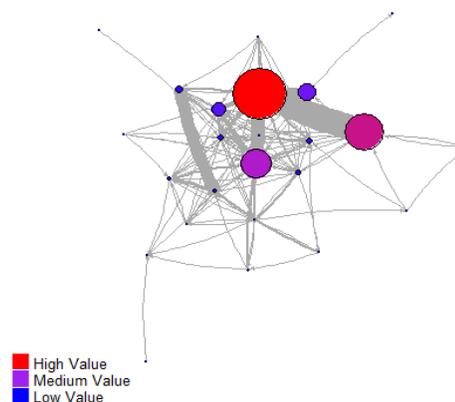


Table 6.1 Descriptive statistics of the financial institutions' "funding to" exposures network²

	Sep-19	Sep-20
Total System Funding To Exposure (J\$'000)	368,129,314	264,409,806
Total System Funding To Exposure (% Total System Assets)	15.2	9.9
Total Funding of Highest Lender (J\$'000)	50,350,559	47,805,738
Total Funding of Highest Lender (% Lender's Assets)	12.0	10.7
Maximum Single Transaction (J\$'000)	13,978,608	22,162,613
Network Mean (J\$'000)	666,901	479,873
Reciprocity (%)	52.3	44.1
Density (%)	27.0	23.3

¹ The three largest nodes represent foreign institutions and two commercial banks. Both commercial banks are Jamaican SIFIs.

² Density measures the network's completeness and is the unconditional probability that two institutions have a relationship

with each other i.e. the number of actual linkages to the maximum possible number of linkages in the network.

Figure 6.2 Network of gross credit exposures within the financial system at end-September 2020

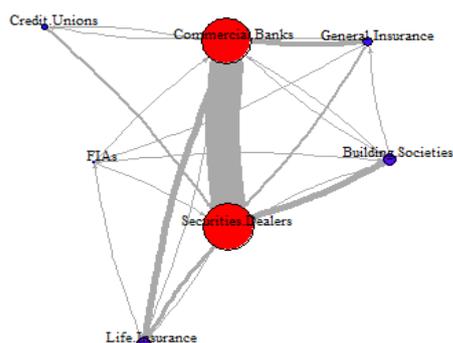


Table 6.2 Average system exposure of deposit taking institutions and securities dealers

	%	SDs	Insurance	DTIs	Domestic	Foreign
Average DTI's 'Funding From' to DTI's Assets		4.9	2.2	3.3	12.3	5.1
Average DTI's 'Funding To' to DTI's Assets		7.6	0.1	10.4	11.6	9.0
	%	SDs	Insurance	DTIs	Domestic	
Average SD's 'Funding From' to SD's Assets		3.0	3.0	2.7	15.3	
Average SD's 'Funding To' to SD's Assets		14.0	0.1	7.5	31.5	

³ Reciprocity measures the proportion of mutual relationships to the overall number of relationships in a network. It is a measure of bi-directional relationships, ie. a node relation is reciprocated if an institution both

6.2 Contagion and Spillover Risks

Contagion and spillover risks declined for the review period ended-September 2020, as the COVID-19 pandemic led to a reduction in the value of financial positions vis-à-vis other financial entities. However, network analysis metrics still indicated a highly interconnected system, as there continued to be a large proportion of reciprocated links and significant density (see **Figure 6.1**).³ Nevertheless, reciprocated links decreased to 44.1 per cent at the end of September 2020, from 52.3 per cent at end-September 2019 (see **Table 6.1**). The high level of reciprocation exhibited institutions' willingness to lend and borrow from each other, albeit at lower values, even under the financial stress caused by the pandemic. Therefore, the financial system was still exposed to significant counterparty and interconnectivity risk.

6.3 Gross Funding in the Financial System

The commercial banking and securities dealer sectors were the most significant contributors to gross funding in the financial system over the review year. Furthermore, both sectors recorded funding relationships with all other sectors in the financial system (see **Figure 6.2**). Specifically, the network analysis indicated that six commercial banks and five securities dealers had a crucial funding role within the financial system.

Of note, securities dealers and DTIs continued to have significant funding relations with each other (see **Table 6.2**). On aggregate, securities dealers funding to other domestic financial entities amounted to approximately 31.5 per cent of the sector's total assets, almost three times more than the share for the corresponding period in 2019. Notably, the COVID-19 pandemic did not have a negative impact on DTIs' foreign financial institutions' exposure relative to DTIs' total assets, with funding to and from

borrowers and lends to the same institution. High levels of reciprocity raises the counterparty and interconnectivity risks, which could result in a collapse of the funding system in a stress period.

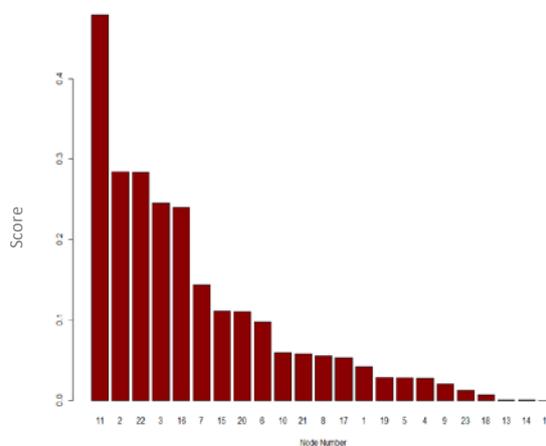
foreign institutions relative to system assets both increasing for the review period.

The impact of the COVID-19 pandemic on economic activity contributed to a substantial decrease in gross funding exposures for the year ended-September 2020. Total funding value of DTIs and securities dealers fell by 28.2 per cent to \$264.4 billion at end-September 2020, 9.9 per cent of their combined assets (see **Table 6.1**). The largest creditor contributed \$47.8 billion, 10.7 per cent of its assets, with significant funding to foreign institutions. At September 2020, the maximum single transaction was \$22.1 billion with the network mean increasing to \$0.5 billion per funding transaction.

There was a slight decline in the systemic risk score for the review period, indicating a reduction in the risk of contagion within the financial system. At end-September 2020 the overall risk score was 4.4 relative to 4.9 at end-September 2019.⁴ Within the financial system, four financial institutions continued to be both critical and key contributors to the interbank risk composition.⁵ Specifically, two commercial banks and two securities dealers were deemed to be critical to the financial system. Accordingly, there would be a strong potential for the failure of the entire financial system if the operations of these institutions were disrupted. Of note, two of the critical institutions belonged to the same financial holding company (see **Figure 6.3**). In addition, the top five risk contributors included one SIFI as well as institutions with strong intra-group relationships.

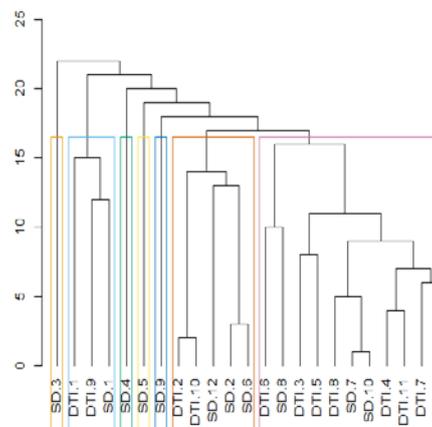
The interbank network continued to be significantly fragile and vulnerable. Three articulation points were identified in the network at end-September 2020, signalling vulnerabilities in the interbank system, albeit, a slight improvement relative to the previous review

Figure 6.3 Network risk score decomposition at-end September 2020



Note: Node number here refers to each institution's contribution to the systemic risk score

Figure 6.4 Dendrogram as at end-September 2020



Note: The dendrogram was used to illustrate the link between financial institutions based on their similarities in structure. This often highlights the uniformity of business models within financial groups.

⁴ See: M. Cihak (2014), "Stress Tester: A Toolkit for Bank-by-Bank Analysis with Accounting Data", A Guide to IMF Stress Testing: Methods and Models. This score is a network metric used to depict overall system risk. It is computed using an adjacency matrix which is used to

quantify the influence of each node and a rating for each institution. The ratings are used as proxies for credit quality and are computed using the Cihak Model.

⁵ Criticality measure incorporates the ratings of institutions with their centrality and is used to highlight institutions that are critical as it relates to failure of the system,

Figure 6.5 Network of gross credit exposures among financial holding companies, DTIs and SDs at end-September 2020

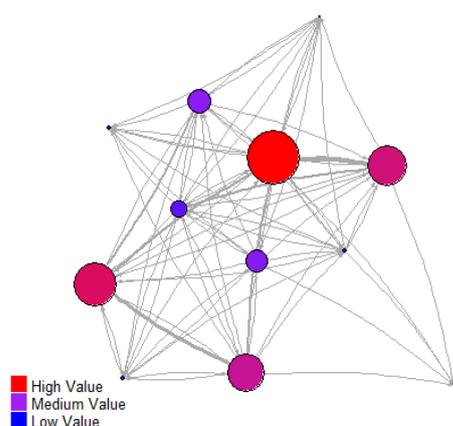


Table 6.3 Descriptive statistics of the financial institutions funding exposures network excluding group affiliates and foreign entities

	Sep-19	Sep-20
Total System Funding To Exposure (J\$'000)	53,947,309	74,550,958
Total System Funding To Exposure (% Total System Assets)	2.2	2.8
Total Funding of Highest Lender (J\$'000)	17,197,696	18,912,042
Total Funding of Highest Lender (% Lender's Assets)	8.3	27.1
Maximum Single Transaction (J\$'000)	6,092,670	9,230,332
Network Mean (J\$'000)	101,980	140,928
Reciprocity (%)	42.6	42.7
Density (%)	21.3	20.4

Removal of these three financial institutions would result in a weakening of the financial system's funding flow as it would hinder access to funding for some institutions. The network also continued to be substantially fragile, which signalled high concentration risk despite a decrease in the fragility score to 14.2 from 14.8 at end-September 2019.⁶

6.3.1 Funding Relationships with Foreign Entities

There was a significant reduction in funding between the domestic financial system and foreign entities. At end-September 2020, foreign entities contributed a total of \$141.3 billion in funding relationships with domestic DTIs and securities dealers and displayed significant relationships with group affiliates. However, this amount represented a 48.5 per cent decrease when compared to end-September 2019.

Notably, DTIs and securities dealers belonging to a multinational financial group will continue to exhibit strong foreign institution funding relations as a result of their internal business structures and policies. Further, the outcome highlighted the domestic funding system's ongoing susceptibility to international financial shocks. This was evident in the impact of the COVID-19 pandemic, which resulted in an overall decline in the world economy and constrained entities' ability to carry out regular external financial transactions.

6.4 Clusters

The analysis of the funding network identified seven clusters, wherein each cluster was generally made up of entities of the same financial holding company. There was an increase in clusters relative to September 2019, which signalled that institutions

⁶ Fragility refers to how quickly the failure of any one institution would trigger failures across the domestic

interbank network. A network with a fragility score greater than 2 is considered to be fragile.

became less similar among themselves during the pandemic (see **Figure 6.4**).⁷

6.5 Financial Groups⁸

Financial group analysis also emphasised the critical role that holding companies continue to play in the domestic financial system. Reciprocity of the group network was 61.5 per cent which indicated that groups were willing and able to engage with other financial groups as it relates to funding transactions even with the ongoing pandemic (see **Figure 6.5**). Although reciprocity remained high, a healthy financial system requires a certain level of reciprocation to allow the system to function at its full potential. However, if one financial group comes under stress this may jeopardise the operations of the groups that they engage with, which would result in spillovers and contagion across groups. The group network’s fragility increased slightly, to a score of 13.9 from 13.7 at end-September 2019, remaining well above the threshold of 2.

Total system funding exposures were also notably less after intra-group transactions and foreign transactions were removed to form a new network. However, there was an increase of 38.4 per cent to \$74.6 billion in this new network at end-September 2020, which represented 2.8 per cent of the system’s total assets (see **Table 6.3**). The largest creditor changed subsequent to the removal of intra-group and foreign transactions. This creditor contributed \$18.9 billion or 27.1 per cent of its assets for the review period.

Figure 6.6 JamClear@-RTGS payment network (December 2020 Quarter)

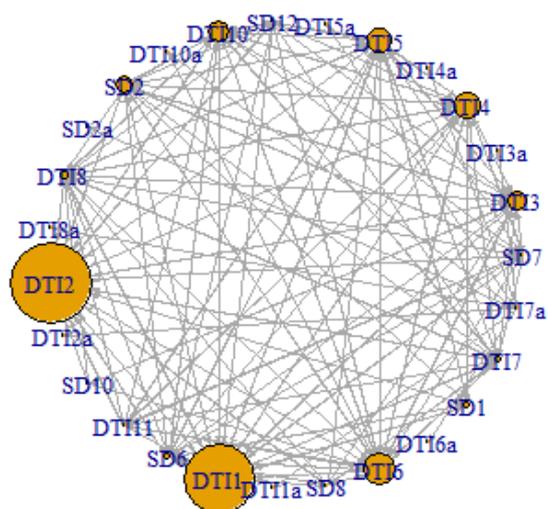


Table 6.4 Core JamClear@-RTGS payment network statistics

	March 2020	Q4 2020
Number of Nodes	28	27
Number of Links	213	191
Density (%) – Connectivity	28.2	27.2
Average Path Length ⁹	1.3	1.4
Diameter ¹⁰	6	2

⁷ The dendrogram illustrates how similar components of a data set are using a walk trap community algorithm which identifies clusters in networks via randomwalks.

⁸ Analysis was conducted by aggregating financial institutions according to their associated financial group, if any, therefore each node now represents a financial group in the network graph

⁹ An average path length of one indicates that all participants have sent a payment to all others. A longer path

length indicates that activity is concentrated among fewer pairs of participants.

¹⁰ The diameter indicates the maximum distance between any two participants in the network. The diameter can provide an indication of how easily or quickly an event affecting a participant could potentially affect the others in the network. A shorter diameter indicates a faster speed of contagion within the network.

Figure 6.7 Vulnerability level after credit and funding shocks on DTIs and SDs were applied

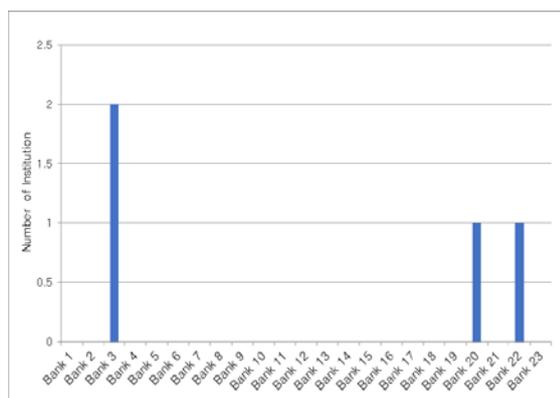
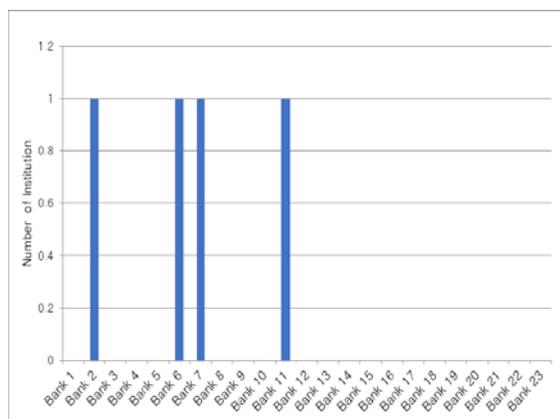


Figure 6.8 Number of induced failures after credit and funding shocks on DTIs and SDs



6.6 Systemically Important Banking Groups

At end-September 2020, based on SIFI score analysis, the three systemically important banking groups were unchanged relative to end-September 2019. Furthermore, total SIFI group assets as a share of total financial system assets was 63.2 per cent at end-September 2020 relative to 63.4 per cent at end-September 2019. The outturn for the review year highlighted the continued high degree of concentration and contagion risks within the financial system and the need to continuously monitor developments related to these groups, especially in the COVID-19 environment.

6.7 Evaluating the JamClear®-RTGS payment system network topology interconnectedness

The commercial banking sector continued to be the dominant sector within the JamClear®-RTGS payment network. This was reflected by the larger nodes in the networks of which the three D-SIFI's were found to be the most critical participants, raising contagion risk concerns for the financial system (see **Figure 6.6**). Notably, for the December 2020 quarter, securities dealers showed a decrease in their level of importance within the payment network. There was a reduction in network connectivity to 27.2 per cent during the last quarter of 2020 from 28.2 per cent at end-March 2020, as well as a significant decline in the number of payment transfers (see **Table 6.4**). Although there was a decline in connectivity, the speed of contagion, measured by the diameter, increased significantly. In particular, the number of participants on the diameter fell to two for the fourth quarter from six for March 2020 quarter. Notably, the speed of contagion has been rising consistently overtime, highlighting an increase in the risk of contagion among JamClear®-RTGS participants.

6.8 Stress Tests

The COVID-19 pandemic resulted in DTIs and securities dealers being more susceptible to hypothetical simultaneous credit and funding shocks.^{11,12} Specifically, the application of these hypothetical shocks resulted in the failure of three institutions (see **Figure 6.7**). Of these failures, two resulted from non-fulfilment of funding obligations between a securities dealer and a DTI in the same financial holding company. Further, the failure of the third institution, which was a non-SIFI commercial bank, was induced by two SIFI commercial banks (see **Figure 6.8**). In addition, some of the remaining institutions suffered minor impairments to capital when the hypothetical shocks were applied. Also, two of the three SIFI financial groups recorded a high score on the contagion index, raising concerns of possible spillover risks to the financial system through the interbank funding channel.

Furthermore, one of the two SIFI commercial banks, which also served as an articulation point, was susceptible to hypothetical liquidity shocks.¹³ The other SIFI commercial bank, which was also important to the overall funding network, was susceptible to both hypothetical interest rate and foreign exchange rate shocks (see **Figure 6.1**).^{14,15}

Notably, the securities dealer which induced a failure in its group affiliated commercial bank, was susceptible to the hypothetical liquidity and interest rate shocks that were examined. These results have elevated the overall concern about the vulnerability of the interbank funding system and its ability to function under stressed conditions. The likelihood of the onset of spillover effects and contagion in the domestic financial system is also of concern.

¹¹ The credit shock scenario applied entails an institution defaulting on all its funding obligations (i.e. 100% of its debts will not be repaid)

¹² The funding scenario applied entails a shortfall in an institution's provision of funding by 35% of the exposure.

¹³ The hypothetical liquidity shock is the application of a 50% reduction in deposits for DTIs and repo liabilities for securities dealers.

¹⁴ The hypothetical interest rate shock applied are 1100/100 bps and 275/15 bps

¹⁵ The hypothetical foreign exchange shock applied is a 50.0 per cent depreciation in the local currency vis-à-vis the US dollar.

Box 6.1 Wire Transfers

Bank of Jamaica conducted a thematic assessment of wire transfers in the Jamaican financial system given that wire transfers represent a potential source of money laundering risk exposure. The key objectives of this assessment included informing stakeholders about potential areas of vulnerability due to money laundering within the financial system, and recommending mitigating policy actions at the national and entity levels.

The assessment utilized transactional data from DTIs for the period April 2018 to March 2019 as well as information from Transparency International's Corruption Perceptions Index (CPI) between 2014 and 2018. This investigation was premised on the presumption that the financial system in Jamaica is susceptible to money laundering or terrorist financing (ML/TF) risks emanating from other jurisdictions. As such, the study included identifying the level of exposure to ML/TF risks among DTIs in Jamaica.

The Caribbean Financial Action Task Force's (CFATF's) 2017 Anti-Money Laundering and Combatting the Financing of Terrorism (AML/CFT) Mutual Evaluation Report highlighted limitations in Jamaica's capacity to manage risks related to AML/CFT. The Mutual Evaluation Report underscored that the preceding National Risk Assessment (NRA) did not include all stakeholders, and suggested a strengthening of the identification

and mitigation strategies relating to ML/TF risks in Jamaica.

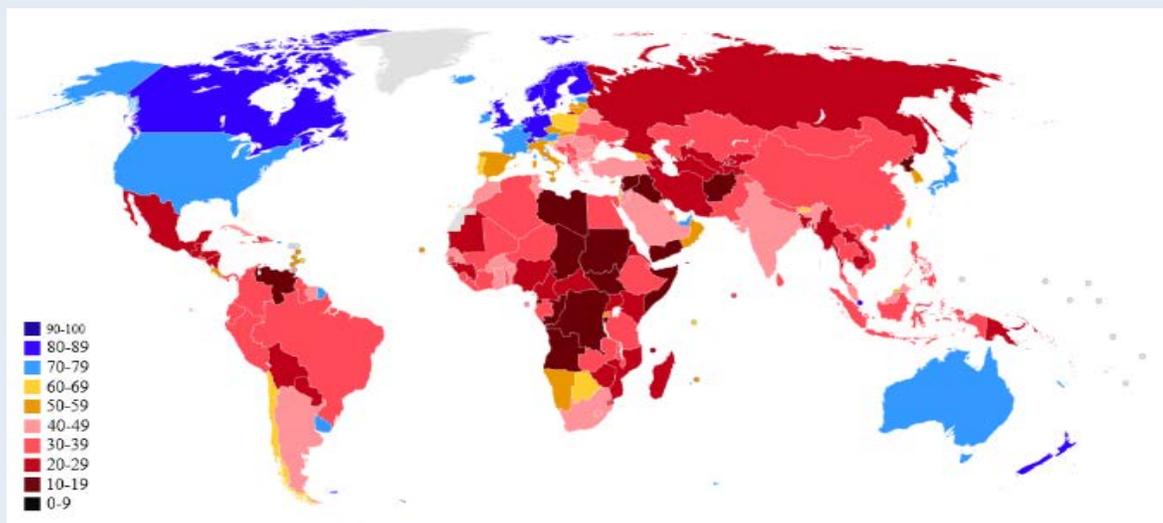
Additionally, the 2018 Financial Sector Assessment Program (FSAP) review of Jamaica's financial system, which was conducted in 2018, implored the need for the Bank to bolster its macro-prudential oversight framework. This FSAP proposal specified the need for full risk-based AML/CFT supervision of DTIs and Cambios within the short-term. These recommendations emphasized the need for the local financial system to understand and support best practices for AML/CFT.

In 2017, the BOJ initiated the implementation of risk-based AML/CFT supervision of licensees, in keeping with the Financial Action Task Force (FATF) recommendation made in January of the same year.

1. Perception of Corruption

The 2018 publication of the CPI ranked Jamaica as being the 70th least corrupt nation of 175 countries. Over the preceding decade, Jamaica's average CPI rank was 72.3 (see Figure 1).

Figure 1: Corruption Perceptions Index - Heat Map (2018)



Source: https://en.wikipedia.org/wiki/Corruption_Perceptions_Index

2. Wire Transfer Flows

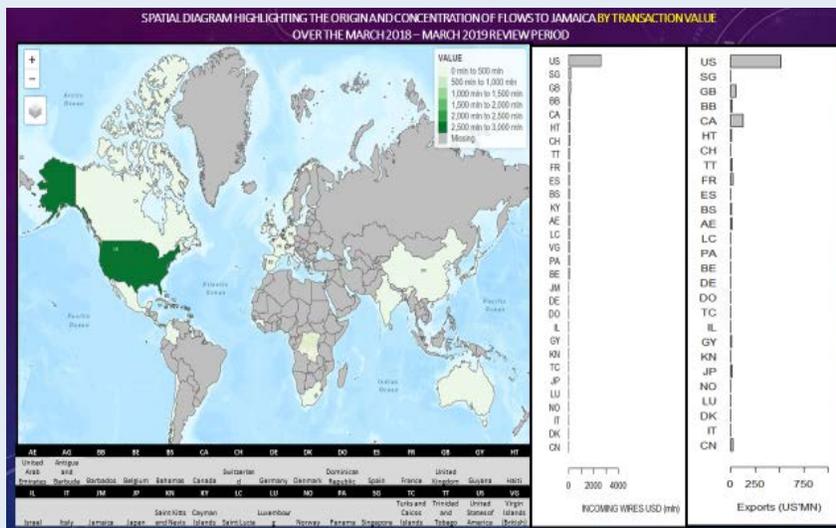
The study revealed that the United States of America (USA), Great Britain, and Canada accounted for the majority of wire transfer transaction flows to Jamaica over the review period.¹ Of note, these countries also recorded lower perceptions of corruption during this period.

For the April 2018 to March 2019 review period, the USA, Great Britain, and Canada, collectively accounted for approximately 72.5 per cent (66,756) of total transaction volume and 75.0 per cent (US\$3.6 billion) of total transaction value (see Figure 2). The high concentration of wire transfers from these countries was due to the significant presence of the Jamaica diaspora in these regions, as well as Jamaica’s strong economic relationships with these countries. Against this background Jamaica’s susceptibility to ML/TF risks from wire transfers might be considered fairly low based on the low

CPI of these countries. Despite the foregoing, there is still the need for continued coordination, monitoring, and effective management strategies by DTIs to mitigate against money laundering risk exposures.

The network analysis of wire transfers showed there was significant concentration in the number and value of counterparty transactions by jurisdiction. Over the review period, wire transfer transactions between the USA and Jamaica accounted for approximately 84.4 per cent (19,204) of transaction volume at or above the 50th percentile (See Chart 1)². Wire transfer transaction volume between the US and Jamaica was representative of approximately 97.2 per cent (US\$3.4 billion) of transaction value while transactions involving Jamaica, and Great Britain and Canada, respectively, accounted for approximately 2.3 per cent and 0.8 per cent of transaction value, respectively. In addition, remittances accounted for a substantial proportion of overall wire transfers over the review period.

Figure 2: Spatial Diagram Highlighting the Origin and Concentration of Flows to Jamaica by Transaction Value [FY2018/19]

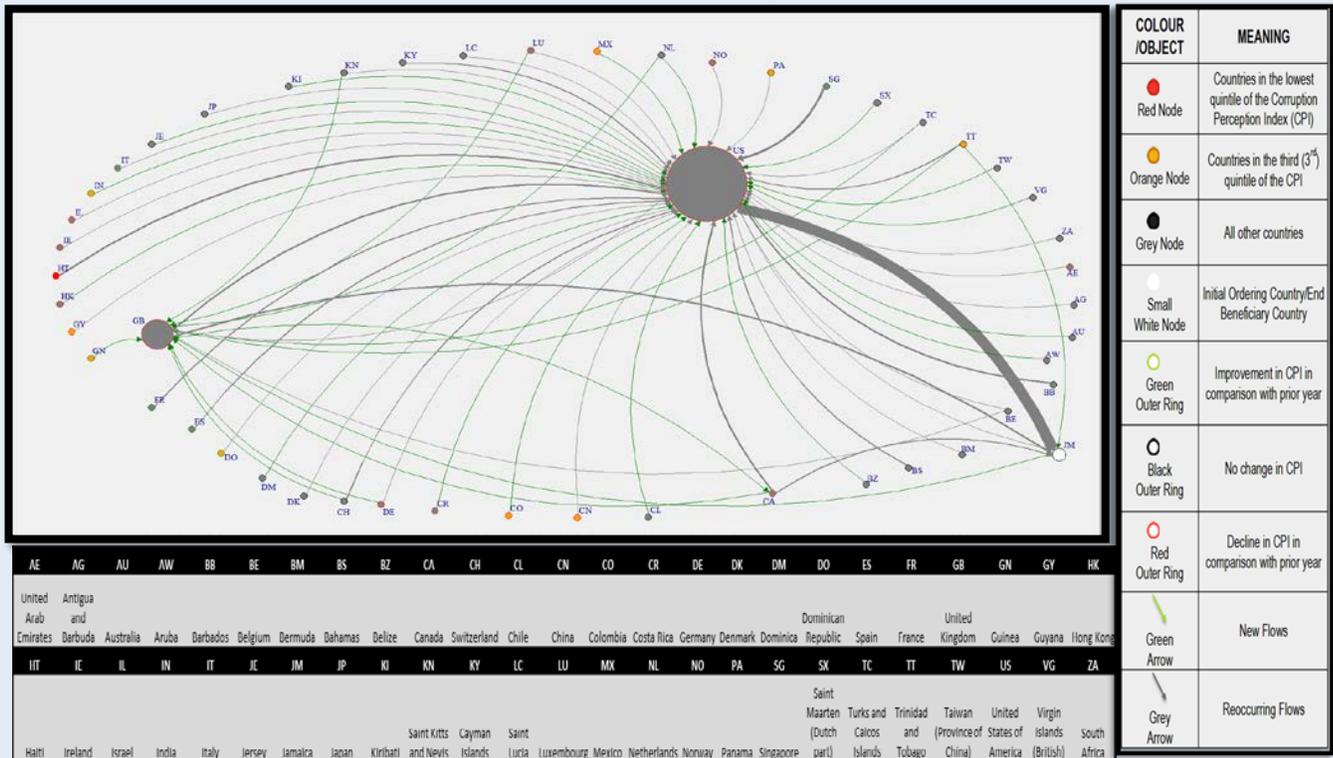


¹ See Chart 1 for key depicting country codes and related countries in Figure 2.

² Percentiles usually refer to the percentage of values that fall below a particular value in a group of data scores. The

50th percentile, here, means the group of transactions that are at or above the median transaction volume.

Chart 1: Geographical Mapping of Flows >= 50th Percentile [April 2018 - March 2019]



In particular, net remittance inflows originating from the USA accounted for approximately 40.6 per cent (US\$1.3 billion) of total incoming wires from the USA to Jamaica (US\$3.2 billion).

3. Correspondent Banking

Despite a few instances of flows of funds to Jamaica from perceived higher-risk countries, these transactions were conducted via correspondent banks in the United States and Great Britain, which are known to have strong AML/CFT mechanisms and regimes. Accordingly, Jamaica’s exposures to ML/TF risks were deemed moderate, as flows from high-risk jurisdictions were low and channeled primarily through the United States and Great Britain, which already have mature and refined AML/CFT systems in place (See Chart 2).

Further, flows from these higher-risk jurisdictions will inform further review driven by

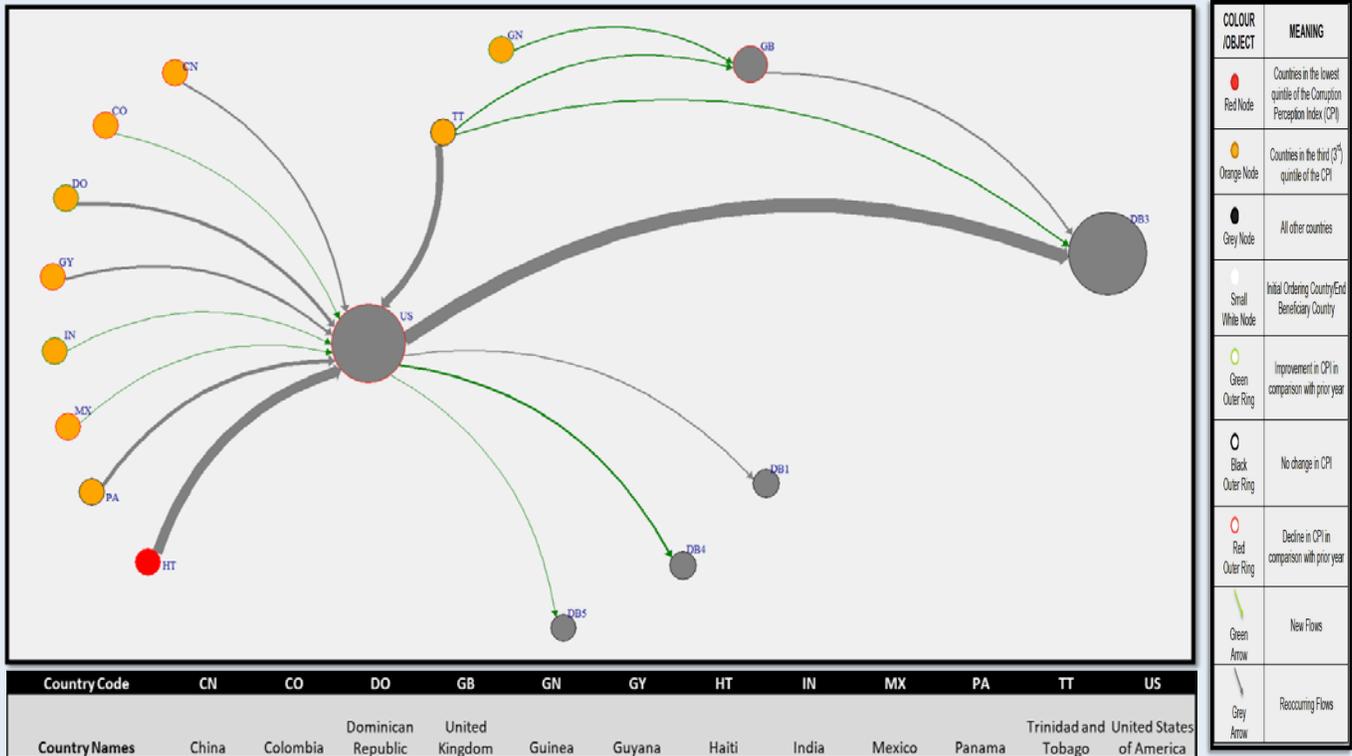
the risk-based review of the internal control environment at the level of the DTI require some investigation in order to ascertain the nature of these transactions and the implied ML/TF risk.

Of note, correspondent banking relationships were concentrated in the USA, with some these transactions originating from ‘blacklisted’ countries. As such, continued evaluation of the internal control environment (ICE) of local DTIs, particularly those that facilitate transactions with higher risk countries.

The concentration of correspondent banking transactions from the USA within a few local DTIs has exposed these DTIs to significant counterparty risks. Furthermore, some of these DTIs have larger exposures to risks that stem from correspondent banking relationships with only a few foreign banks. However, this level of exposure is tempered somewhat for the remaining DTIs, which rely on multiple correspondent banking relationships. Overall, this pattern highlighted that DTIs should

continue to improve their governance arrangements to manage and mitigate risks as well as bolster their internal control environments while simultaneously diversifying correspondent banking relations, given the lingering underlying threat of de-risking.

Chart 2: Geographical Mapping of Flows from Lower Ranked Countries >=50th Percentile



COLOUR OBJECT	MEANING
Red Node	Countries in the lowest quintile of the Corruption Perception Index (CPI)
Orange Node	Countries in the third (3 rd) quintile of the CPI
Grey Node	All other countries
Small White Node	Initial Ordering Country/End Beneficiary Country
Green Outer Ring	Improvement in CPI in comparison with prior year
Black Outer Ring	No change in CPI
Red Outer Ring	Decline in CPI in comparison with prior year
Green Arrow	New Flows
Grey Arrow	Reoccurring Flows

APPENDIX

Table A.1 Quarterly Financial Soundness Indicators for DTIs

Indicator (%)	Categories	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
Core Indicators									
Regulatory capital to risk-weighted assets	Capital adequacy	14.4	14.6	14.9	14.3	14.2	14.2	14.2	14.3
Tier 1 capital to risk-weighted assets	Capital adequacy	13.3	13.4	13.7	13.2	13.1	13.2	13.4	13.4
Non-performing loans (net) to capital	Capital adequacy	-2.7	-1.7	1.6	-2.7	-1.1	-1.0	-3.7	-2.6
Non-performing loans to total loans	Assets quality	2.4	2.4	3.1	2.2	2.4	2.8	2.7	2.8
Return on assets	Earnings & Profitability	0.6	0.6	1.2	0.6	0.3	0.2	0.3	0.6
Return on equity	Earnings & Profitability	3.7	4.2	8.0	4.0	1.8	1.4	2.0	4.2
Interest margin to income	Earnings & Profitability	46.0	47.6	39.8	46.8	50.7	52.9	50.0	41.7
Non-interest expenses to income	Earnings & Profitability	23.1	23.4	20.1	22.0	24.4	24.1	24.8	22.8
Liquid assets to total assets	Liquidity	22.4	22.4	22.4	20.7	22.3	22.2	22.2	23.8
Duration on assets -Domestic Bonds	Sensitivity to Market Risk	0.8	1.1	1.2	1.7	1.5	1.9	1.7	N/A
Duration on assets-Global Bonds	Sensitivity to Market Risk	2.7	2.2	2.4	2.5	2.7	2.4	2.2	N/A
NOP to capital	Sensitivity to Market Risk	-6.4	-6.8	-1.1	-10.8	-15.2	-14.6	-23.1	N/A
Encouraged Indicators									
Capital to assets	Capital adequacy	14.9	15.0	15.3	15.0	14.1	13.9	13.3	13.6
Trading income to total income	Earnings & Profitability	14.2	15.1	30.3	17.4	11.5	13.1	11.9	24.6
Personnel expenses to non-interest expenses	Earnings & Profitability	33.8	35.9	37.0	29.5	31.0	30.3	27.8	30.8
Spread between lending & deposits rates ^{1/}	Earnings & Profitability	11.6	11.4	11.3	10.9	10.8	10.6	10.5	10.3
Deposits to total (non-interbank) loans	Liquidity	133.0	132.3	129.5	125.7	129.1	128.6	133.5	132.5
Foreign-currency-denominated loans to total loans	Foreign Exchange risk	22.1	22.3	22.3	21.8	21.1	21.6	21.5	21.4
Foreign-currency-denominated liabilities to total liabilities	Foreign Exchange risk	36.8	37.6	37.2	35.8	37.3	37.1	38.7	37.7
Household debt to GDP	Household sector leverage	21.3	18.3	20.2	22.9	23.4	24.7	25.9	26.6

Notes:

^{1/}Weighted by assets size

Table A.2 Quarterly Financial Soundness Indicators for SDs and ICs

Indicator (%)	Categories	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20
A. Securities Dealers ^{1/}									
Regulatory capital to risk-weighted assets	Capital adequacy	20.8	21.1	22.5	21.4	18.6	21.2	22.4	22.3
Tier 1 capital to risk-weighted assets	Capital adequacy	16.6	15.6	14.1	16.2	16.5	17.3	17.7	17.9
Non-performing loans (net) to capital	Capital adequacy	0.0	0.2	0.3	0.3	0.3	0.0	0.1	0.3
Non-performing loans to total loans	Assets quality	3.5	4.4	4.5	4.1	3.2	2.6	2.3	2.4
Return on assets	Earnings & Profitability	0.4	1.2	2.3	0.5	-0.1	0.2	0.9	0.7
Return on equity	Earnings & Profitability	3.2	8.5	15.4	3.4	-0.8	1.6	6.0	4.6
Interest margin to income	Earnings & Profitability	21.2	16.0	12.2	22.1	27.8	24.3	14.3	18.3
Non-interest expenses to income	Earnings & Profitability	43.2	29.0	22.7	39.8	68.0	44.3	31.4	37.0
Liquid assets to total assets	Liquidity	17.5	18.0	17.3	16.8	16.8	16.2	15.7	14.6
Duration on assets –Domestic Bonds	Sensitivity to Market Risk	3.3	3.1	3.9	3.8	3.7	3.7	3.7	3.7
Duration on assets–Global Bonds	Sensitivity to Market Risk	9.5	9.8	7.9	10.3	10.3	10.3	10.3	10.3
NOP to capital	Sensitivity to Market Risk	14.3	12.6	10.8	-13.3	-27.1	7.8	46.9	0.0
B. General Insurance									
Net premium to Capital	Capital adequacy	23.1	25.6	25.1	27.0	25.7	24.0	24.6	22.9
Capital to Assets	Capital adequacy	28.8	26.4	25.0	25.6	24.7	23.1	24.4	25.5
(Real estate + unquoted equities + debtors) to total assets ^{2/}	Assets quality	27.2	31.7	30.5	31.9	31.4	37.0	34.2	32.9
Receivables to gross premiums	Assets quality	168.8	138.9	194.7	205.1	189.8	176.8	211.5	219.1
Equities to total assets	Assets quality	3.7	3.9	4.2	4.2	2.8	2.5	2.5	2.8
Net technical reserves to net claims paid in last 3 years	Reinsurance & actuarial issues	430.8	446.0	416.5	378.8	361.0	345.6	336.8	328.9
Risk retention ratio (net premium to gross premium)	Reinsurance & actuarial issues	45.6	32.0	43.5	47.9	41.3	28.0	39.5	41.5
Gross premium to number of employees J\$(000)	Management Soundness	10.0	16.2	10.6	10.4	11.3	16.3	12.1	10.8
Assets per employee J\$(000)	Management Soundness	68.8	76.6	73.5	71.7	74.0	82.3	79.5	77.0
Net Claims to net premium (loss ratio)	Earnings & Profitability	64.7	66.6	53.8	57.1	67.8	55.9	59.6	55.8
Total expenses to net premium (expense ratio)	Earnings & Profitability	93.1	94.4	91.8	89.8	104.2	95.9	90.8	94.5
Combined ratio (loss + expense ratio)	Earnings & Profitability	157.8	161.0	145.6	146.9	172.0	151.8	150.4	150.4
Investment Income to net premium	Earnings & Profitability	10.9	16.8	14.7	19.0	2.0	10.1	10.3	12.3
Return on Equity	Earnings & Profitability	2.0	4.3	6.4	5.4	0.0	4.0	5.3	5.2
Liquid assets to total liabilities	Liquidity	71.4	61.9	66.9	67.5	66.1	66.1	64.7	63.9
C. Life Insurance									
Capital to technical reserves	Capital adequacy	107.6	106.9	108.6	115.8	120.1	127.7	97.7	104.6
(Real estate + unquoted equities + debtors) to total assets	Assets quality	4.7	5.1	5.5	5.9	5.9	6.1	6.0	5.8
Receivables to gross premiums	Assets quality	80.3	87.6	81.1	90.5	79.9	75.6	74.7	61.4
Equities to total assets	Assets quality	3.7	4.4	5.1	5.2	5.4	5.3	4.9	5.0
Net technical reserves to net premium paid in last 3 years	Reinsurance & actuarial issues	641.7	648.3	650.0	609.8	564.4	549.9	717.3	673.6
Risk retention ratio (net premium to gross premium)	Reinsurance & actuarial issues	98.6	97.6	98.3	98.2	98.5	98.3	98.2	97.9
Gross premium to number of employees J\$(000)	Management Soundness	8.2	8.5	9.6	8.9	9.3	10.3	10.1	11.6
Assets per employee J\$(000)	Management Soundness	170.0	173.1	175.1	177.6	180.9	184.9	185.1	188.2
Expenses to net premium (expense ratio)	Earnings & Profitability	46.6	44.8	41.5	56.0	29.8	36.9	42.0	60.6
Investment Income to investment assets	Earnings & Profitability	1.7	2.9	3.3	1.8	-2.1	1.7	1.5	3.3
Return on Equity	Earnings & Profitability	5.6	8.2	8.7	7.6	4.9	9.8	14.9	10.6
Liquid assets to total liabilities	Liquidity	24.5	30.7	27.1	27.0	28.5	25.8	23.2	20.8
Duration on assets –Domestic Bonds	Sensitivity to market risk	2.5	1.9	3.2	2.3	2.7	3.4	2.7	3.4
Duration on assets–Global Bonds	Sensitivity to market risk	7.0	10.2	9.6	10.6	10.1	11.1	10.1	11.1

Notes:

^{1/} Includes the twelve securities dealers that makes up 70.0 per cent of the market

^{2/} Data revised to include "Recoverable from Reinsurers" as debtors

Table A.3 Annual Sectoral Indicators of Financial Development

Sub-sector	Indicator	Dec-14	Dec-15	Dec-16	Sep-17	Sep-18	Sep-19	Sep-20
Banking	Total number of DTIs	11	11	11	11	11	11	11
	Number of branches and outlets	165	165	165	165	157	157	161
	Number of branches/thousands population	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	Bank deposits/GDP (%)	44.3	47.1	50.4	52.7	55.1	55.1	68.6
	Bank assets/total financial assets (%) ^{1/}	35.7	36.8	37.1	37.3	38.1	37.8	37.8
	Bank assets/GDP (%)	69.3	71.8	77.9	80.4	83.4	85.3	101.5
Insurance	Number of insurance companies ^{2/}	15	16	17	16	17	15	15
	Gross premiums/GDP (%)	4.9	4.8	5.1	5.3	5.3	5.3	7.0
	Gross life premiums/GDP (%)	2.6	2.5	2.8	3.1	2.9	3.1	4.0
	Gross non-life premiums/GDP (%)	2.2	2.3	2.3	2.2	2.4	2.2	3.0
	Insurance assets/GDP (%)	20.7	21.2	21.1	20.8	20.6	20.1	22.9
	Insurance assets/total financial assets (%)	11.0	10.7	10.5	9.6	9.6	9.0	8.5
Pensions	Types of pension plans							
	Total number of defined benefit plan	110	107	106	99	98	93	88
	Total number of defined contribution plan	319	308	304	300	295	288	290
	Pension fund assets/total financial assets (%)	11.4	11.5	12.0	12.8	13.7	14.5	12.0
	Pension fund assets/GDP (%)	22.1	22.4	25.2	27.6	29.9	32.8	32.1
Mortgage	Mortgage assets/total financial assets (%) ^{3/}	7.9	8.4	8.4	6.4	7.7	7.8	7.9
	Mortgage assets/GDP (%)	15.4	16.4	17.6	13.7	16.9	17.5	21.2
Securities Dealers	Total number of securities dealers	30	29	32	32	31	30	30
	Securities dealer's/total financial assets (%)	18.2	16.6	15.8	15.0	13.8	14.0	13.6
	Securities dealer's assets/GDP (%)	35.3	32.5	33.3	32.3	30.2	31.6	36.6
Credit Union	Total number of credit unions	37	37	37	29	26	29	26
	Credit union's assets/total financial assets (%)	2.7	2.7	2.4	2.6	2.5	2.6	2.6
	Credit union's assets/GDP (%)	5.3	5.3	5.1	5.6	5.6	5.8	6.9
Foreign exchange markets	Adequacy of foreign exchange (reserves in months of imports)	5.0	5.9	5.8	6.3	5.8	7.7	6.2
	Foreign exchange reserves as ratio to short-term external debt (%)	279.8	527.2	277.3	658.9	594.5	683.9	184.3
Collective investment scheme	Local unit trust and mutual funds (J\$BN) ^{4/}	111.0	136.4	181.2	211.5	266.9	332.8	331.3
	Number of local unit trust and mutual funds	11	12	13	14	18	19	19
	Local unit trust and mutual funds/total financial assets (%)	3.7	4.3	5.0	5.3	6.1	7.0	6.2
	Overseas mutual funds (value of units held by Jamaicans)US\$MN	177.0	200.9	223.0	258.6	275.5	293.1	306.9
	Overseas mutual funds/total financial assets(%)	0.7	0.7	0.8	0.8	0.9	0.8	0.8
Sub-sector	Indicator	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20
Capital markets	Number of listed securities (equities) ^{5/}	54	64	68	66	73	63	87
	Number of new issues (equities) ^{6/}	7	1	7	8	15	7	5
	Number of new issues (bonds) ^{7/}	0	0	6	8	3	2	1
	Value of new issues (bonds) J\$BN	0	0.0	41.8	55.8	15.0	5.0	5.0
	Market capitalization/GDP (%)	19.0	36.9	39.7	55.9	69.6	91.3	83.6
	Value traded/market capitalization (%)	5.4	2.8	3.5	3.4	4.7	4.3	4.9

Notes:

^{1/} Financial system assets include assets for banks, insurance companies, credit unions, securities dealers, pension funds, unit trust FUM and mutual funds.

^{2/} There are six life insurers and eleven general insurers. Of the eleven general insurers, two are not operational.

^{3/} Includes data for building societies, commercial banks & National Housing Trust

^{4/} Unit trust portfolios are composed mainly of fixed income securities, equities and real estate investments

^{5/} Includes Junior market listings

^{6/} Includes preference shares

^{7/} Government of Jamaica bonds

GLOSSARY

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

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

Repurchase Agreement (Repo)

A contract between a seller and a buyer whereby the seller agrees to repurchase securities sold at an agreed price and at a stated time. Repos are used as a vehicle for money market investments as well as a monetary policy instrument of BOJ.

Retail Payment System

An interbank payment system designated for small value payments including cheques, direct debits, credit transfers, ABM and POS transactions.

Stress Test

A quantitative test to determine the loss exposure of an institution using assumptions of abnormal but plausible shocks to market conditions.

Systemic Risk

The risk of insolvency of a participant or a group of participants in a system due to spillover effects from the failure of another participant to honour its payment obligations in a timely fashion.

