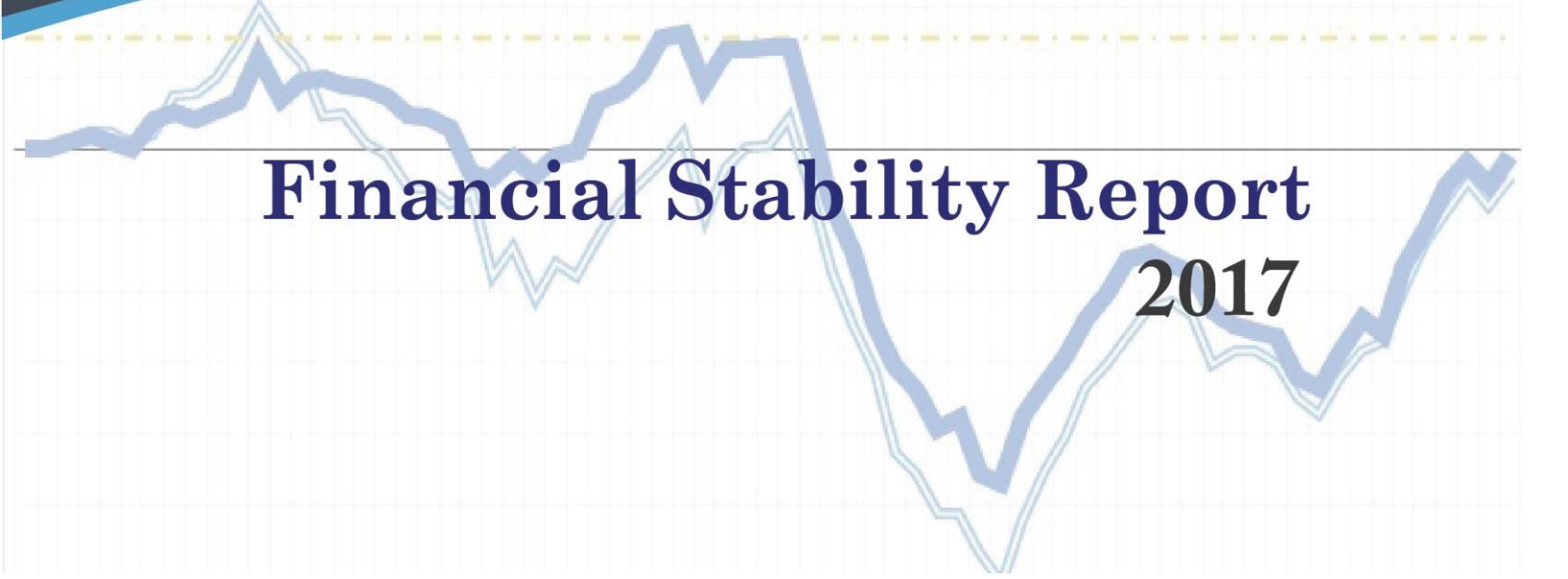




Financial Stability Report 2017





FINANCIAL STABILITY REPORT 2017

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Abbreviations

ABM	Automated Banking Machine	JDX	Jamaica Debt Exchange
ACH	Automated Clearing House	JSE	Jamaica Stock Exchange
AFSI	Aggregate Financial Stability Index	LSCRI	Large-Value System Concentration Risk Index
BOJ	Bank of Jamaica	MaFI	Macro-Financial Index
BPS	Basis Points	MCCSR	Minimum Continuing Capital and Surplus Requirements
CAR	Capital Adequacy Ratio	MCT	Minimum Capital Test
CD	Certificate of Deposit	MiPI	Micro-Prudential Index
CIS	Collective Investment Schemes	NDTFI	Non-Deposit-Taking Financial Institution
CISS	Composite Indicator of Systemic Stress	NDX	National Debt Exchange
CRE	Credit Risk Exposure	NIR	Net International Reserves
CSD	Central Securities Depository	NOP	Net Open Position
D-SIB	Domestic Systemically Important Bank	NPL	Non-Performing Loan
DTI	Deposit-Taking Institution	POS	Point-of-Sale
DVBP	Dollar Value of a Basis Point	RAI	Risk Appetite Index
FIA	Licensee under the Financial Institutions Act	REER	Real Effective Exchange Rate
FSC	Financial Services Commission	ROA	Return on Asset
FSI	Financial Soundness Index	ROE	Return of Equity
FSR	Fiscal Stability Ratio	RTGS	Real-Time Gross Settlement System
FUM	Funds Under Management	RWA	Risk-Weighted Assets
GDP	Gross Domestic Product	SD	Securities Dealer
GOJ	Government of Jamaica	SIFI	Systemically Important Financial Institution
GWP	Gross Written Premium	VIX	Volatility Index
HHI	Herfindahl-Hirschman Index		
IC	Insurance Company		

Preface

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, the 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, in particular banks, 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 2017 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 financial institutions is as at September 2017.

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 Financial institutions include inter alia banks, securities dealers and insurance companies. Financial markets include inter alia foreign exchange, money and capital markets. Financial market infrastructure refers to payment and securities settlement systems.

1. Financial Stability Overview

The financial system continued to deepen as reflected by the growth in system assets and payment system activity for the review period. Total financial system assets increased by 8.6 per cent for the period ending September 2017. Similarly, activity in the large value payments system increased by 18.0 per cent over the calendar year.

For deposit-taking institutions (DTIs), this asset expansion occurred along with a continued improvement in asset quality as measured by the stock of non-performing loans. Solvency and profitability also improved. This was reflected by an increase in the average capital adequacy ratio and return on assets. The asset expansion of non-deposit taking financial institutions (NDTFIs) was however not accompanied by an equivalent improvement in solvency. Both the securities dealers (SDs) and insurance companies sectors demonstrated a decrease in capital ratios for the review period due to an unmatched growth in regulatory capital. However, capital ratios were maintained above prudential benchmarks.

Macro-financial Environment

The observed growth in financial activity has occurred against the background of a number of positive macroeconomic and policy developments. Bank of Jamaica reduced its policy rate three times during the year reflecting a more accommodative policy stance. The signal rate was reduced by 75 basis points and the rate on the Bank's Standing Liquidity Facility was reduced by 100 basis points. In addition to these policy rate reductions, there was a general decrease in interest rates on Government of Jamaica Treasury Bills and declines in private money market rates.

The lower interest rate environment was also accompanied by lower risk conditions. The foreign exchange market demonstrated lower levels of volatility in the exchange rate as the value of the Jamaica Dollar appreciated by 2.75 per cent relative to the US dollar, in contrast to the depreciation of 6.25 per cent recorded in 2016. Positive macroeconomic developments were reflected by the strong performance in

capital markets as Jamaica stock indices increased at a faster pace for 2017 when compared to 2016.

Against the background of stable macro-financial conditions, risks to the financial system remained tempered. Credit continued on an expansionary phase of its cycle. Further, the observed rates of credit growth remained below that deemed excessive. In addition, pro-cyclicality of the financial system with the real economy was deemed to be at normal levels. This view was supported by an assessed absence of excessive growth in real asset prices and an absence of any significant extension in leverage, maturity or liquidity transformation.

Financial System Exposures

The expansion of credit did, however, contribute to vulnerabilities emanating from exposure to private sector debt sustainability. With the reduction in the Government of Jamaica's footprint in the domestic debt market, there was a subsequent increased concentration in DTIs' loan portfolio. Household sector loans as a proportion of total loans increased for calendar year end to end-September 2017.

Consequently, the debt service burden of households as measured by total household debt to disposable income has generally trended upward. Similarly, the debt servicing capacity of the corporate sector as measured by the share of corporate sector debt to corporate sector operating surplus deteriorated for the review period.

Analysis of funding exposures between financial sectors and analysis of exposures between related companies show significant inter-sector and intra-company exposures for some financial institutions. For example, interconnectedness data at end-September 2017 show that total funding to related parties by some DTIs reached 45.0 per cent of capital.

Risk Assessment

DTIs' average exposure to financial risks fell in the first three quarters of 2017 relative to 2016. In addition, stress testing over the review period showed that the DTI sector remained

resilient to the series of hypothetical financial shocks. The results reflected the sectors' strong capital and liquidity positions. Stress testing exercises show that at end-September 2017 SDs' exposure to combined financial shocks, also improved relative to its performance at the close of 2016. SDs did, however, demonstrate larger foreign currency exposures due to aggregate increases in net open position to capital ratios.

In recent years, one of the main financial stability risks identified was that associated with the balance sheets of securities dealers. Historically, some SDs undertook a high level of balance sheet intermediation using short-term obligations to finance their inventory of long-term securities, creating significant market and liquidity risks. Despite improvement in their aggregate risk profile, the resilience to specific interest rate and liquidity shocks show little improvement over time.

A number of initiatives were made in an effort to reduce the balance sheet risks of NDTFIs. The Financial Services Commission (FSC) since 2017 requires all securities dealers to conduct and submit stress tests on a semi-annual basis. The results of which are used to inform the FSC's risk-based supervision.

In addition, the FSC in 2017 conducted studies on appropriate indicators and potential prudential requirements for interest rate and liquidity risk in securities dealers. These studies proposed a "retail repo mismatch ratio" and a "volatile funding sources coverage ratio" which are to be used initially as risk monitoring measures. In further effort to strengthen the regulatory framework and risk management practices within the industry, the FSC in collaboration with BOJ completed a consultation paper in 2017 on prudential guidelines for limiting securities dealers' counterparty exposure.

The BOJ also undertook measures in 2017 for ensuring the resilience of the system, which included the development of

consolidated capital adequacy requirements, a financial holding company oversight regime and the preparation for the assumption of supervisory oversight of the credit union sector.

Further, privately-owned money-lending business will be brought under the remit of Bank of Jamaica, broadening transparency and accountability of the financial system. A Micro-Credit Bill will subject micro money lenders to examinations, regulatory sanctions and licensing requirements.

The trend in dollarization over recent years served as another financial market development that warranted enhanced systemic risk monitoring. Over the review period, the Bank increased the cash reserve and liquid asset reserve requirements for foreign currency liabilities to 15.0 per cent and 29.0 per cent respectively, while discontinuing the remuneration of foreign currency cash reserve. The Jamaica Dollar also demonstrated an overall appreciation and lower trend path in 2017. The GOJ also redeemed early foreign currency debt instruments. These developments helped contribute to an observed moderation in dollarization levels for both DTIs and non-DTIs.

Outlook

Jamaica's economy is projected to grow at a faster rate in 2018 than that recorded in 2017. Similarly, the global economy is projected to expand by 3.5 per cent in 2018 relative to 3.4 per cent in 2017. The macro-financial environment of low and stable inflation coupled with continued monetary loosening may shift financial vulnerabilities.

Currently, exposures to asset categories such as equities and real estate, which can be high yielding but have a higher probability of impairment, remained relatively low but increased marginally over the review period. For example, the share of real estate, unquoted equities and debtors in total assets for the life insurance and general insurance sub-sectors

accounted for 4.1 and 9.7 per cent, respectively, relative to 3.8 per cent and 8.4 per cent at the close of the previous year. A continued decline in interest rates may lead to a more aggressive search for yields by financial sector participants. Such a development in 2018 may result in an over inflation of asset prices or an extension of exposures into riskier assets.

These potential financial system developments will be met with new and developing supervisory frameworks. Measures that will help reduce systemic risk in Jamaica includes plans for legislating a Special Resolution Regime. The regime will allow for the resolution of non-viable financial institutions without severe systemic disruption. It will insulate taxpayers from undue loss and include mechanisms that make it possible for shareholders and unsecured and uninsured connected creditors to absorb losses in a manner that recognizes the hierarchy of claims in the event of liquidation.

The following chapters discuss these issues and provides related data and statistics in more detail.

2. Macro-financial risks

2.1 Overview

The macro-financial environment improved during 2017. This was reflected by the developments in key macroeconomic areas, the financial system and financial market. For the review period, both global and domestic economic performance improved as measured by the growth in GDP. This occurred concurrently with more stable global financial markets.

Domestically, accommodative monetary policy conditions and buoyant liquidity have not resulted in excessive credit growth or significant expansion in the extent of liquidity and maturity transformation conducted by market participants. Furthermore, financial dollarization improved which aided in containing currency risks to the domestic financial system.

Notwithstanding a slight increase in default risk for SDs and DTIs as well as an increase in the number of domestic systemically important banking groups, risks stemming from interdependencies and co-movement in financial performance fell for the review period. These broad developments were reflected by improvements in composite measures of macro-financial risks and a continued resilience of financial institutions to a range of hypothetical financial shocks.

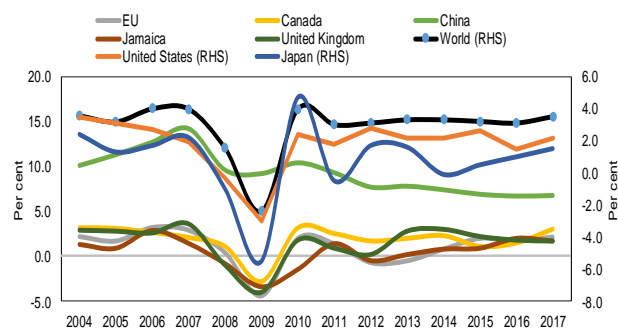
2.2 Global developments

The global economy grew at an estimated 3.5 per cent for the year relative to growth of 3.1 per cent for 2016. The upturn reflected economic gains across several advanced and emerging economies (see **Figure 2.1**).¹ The acceleration in growth was highly evidenced in Canada as well as the USA and Euro area.² However, the UK had a lower growth

¹ See IMF World Economic Outlook Update October 2017.

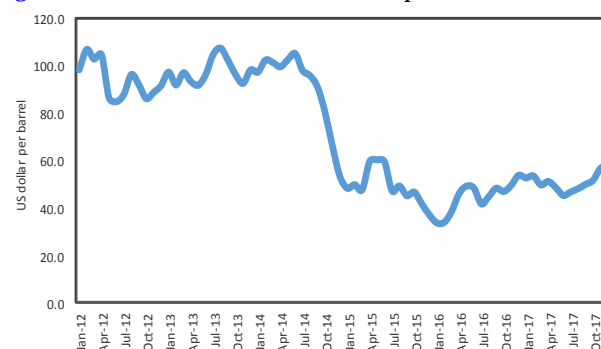
² Growth in the USA largely reflected positive contributions from personal consumption expenditure and the goods and services sector. Euro area growth was reflective of a post-2009 historically low unemployment rate, increase in consumer spending and business investments as well as the strengthening of the French economy. Growth in China was attributed to strengthening personal consumption and

Figure 2.1 GDP growth rates of selected countries



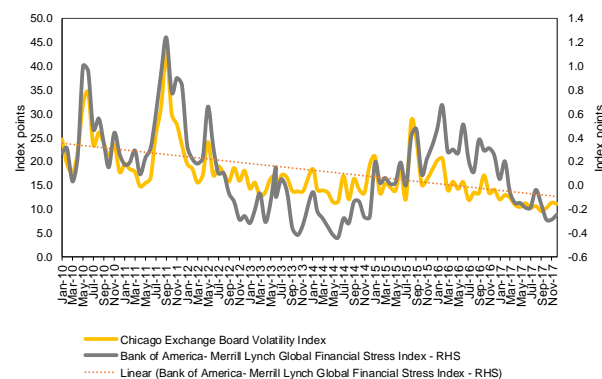
Source: Bloomberg, Bank of Jamaica, IMF World Economic Outlook

Figure 2.2 West Texas Intermediate oil prices



Source: Bloomberg

Figure 2.3 International financial market indicators



Source: Bloomberg

Note: 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. 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.

foreign trade positions. Canada's increase in growth is credited to an increase in household spending and investor confidence as well as gains in the retail trade and manufacturing sectors. The UK's marginal decline is reflective of a rise in inflation causing slower consumer spending growth, and the continued uncertainty surrounding the Brexit deal negotiations.

Figure 2.4 Selected domestic macroeconomic indicators

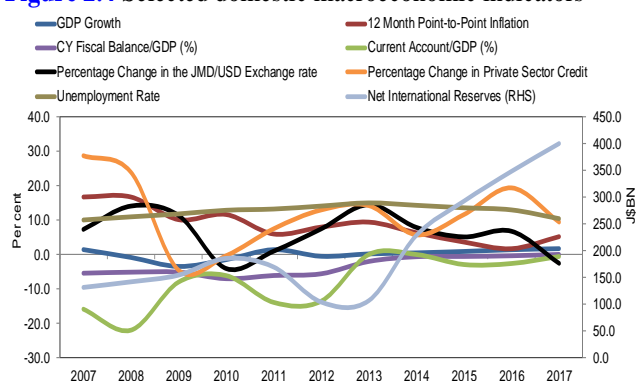


Figure 2.5 TRE spread

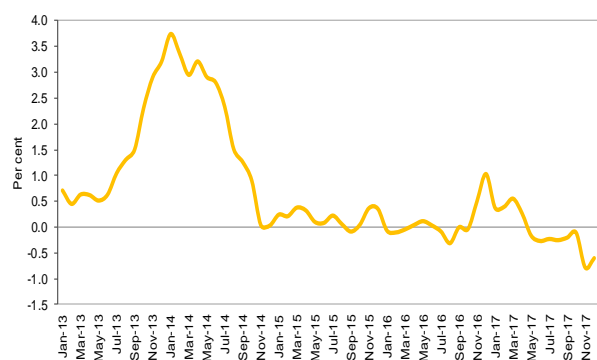
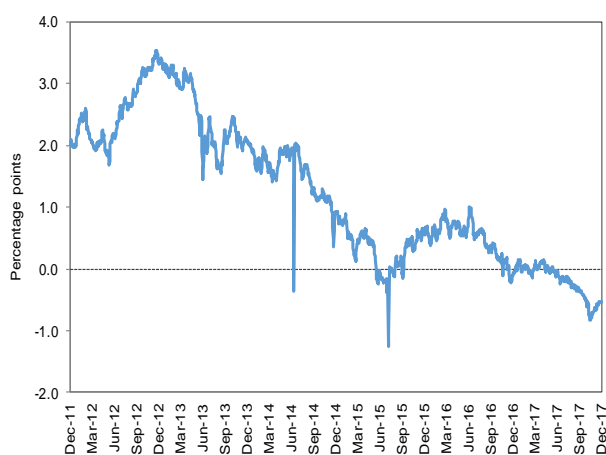


Figure 2.6 Spread between GOJ global bonds and EMBI+



Source: Bloomberg

outturn for 2017 relative to 2016. These improvements occurred within the context of a moderate rise in oil prices throughout the review year. Specifically, West Texas Intermediate (WTI) oil prices increased by 14.6 per cent to US\$50.95 per barrel for 2017 (see **Figure 2.2**).

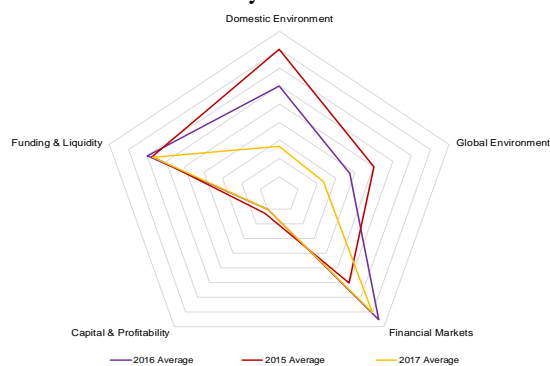
Global financial market volatility decreased for 2017 as measured by the Bank of America Merrill Lynch Global Financial Stress Index (BAML-GFSI) as well as the Chicago Board Options Exchange Volatility Index (VIX) (see **Figure 2.3**). However, the financial markets began the year with spillover financial market uncertainty from 2016 during the first quarter of 2017 before it began an average downward trend for the year.

2.3 Domestic environment

During 2017, the domestic macroeconomic environment recorded favourable performance in key areas. The performance was characterized by growth in GDP as well as improvements in the current account, fiscal position, net international reserves (NIR), the unemployment rate and an appreciation of the domestic currency vis-a-vis the United States dollar (see **Figure 2.4**). DTI private sector credit grew by 9.5 per cent for the calendar year to September 2017 relative to 19.5 per cent in 2016. Specifically, unemployment was recorded at its lowest rate since 2008, at 10.4 per cent in comparison to 12.9 per cent in 2016.

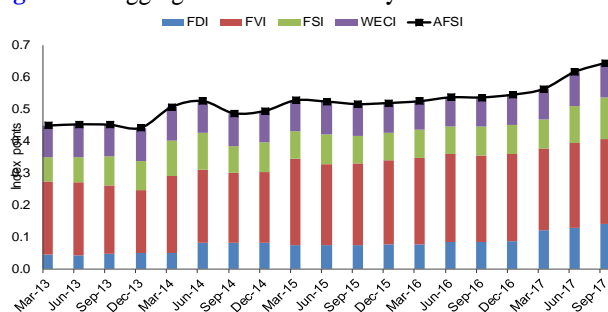
The annual point-to-point change in the CPI was 5.2 per cent for 2017, relative to a historical low of 1.7 per cent for 2016. This was generally in line with the Bank's medium-term inflation target of 4.0 per cent to 6.0 per cent. The Jamaica Dollar vis-à-vis the United States dollar appreciated by 2.7 per cent for 2017 relative to 6.3 per cent depreciation for the prior year. This outturn was due to strong U.S dollar liquidity, supportive macroeconomic fundamentals and increased investor and consumer confidence in the Jamaica Dollar, specifically in the last quarter of 2017.

Figure 2.7 Financial stability cobweb



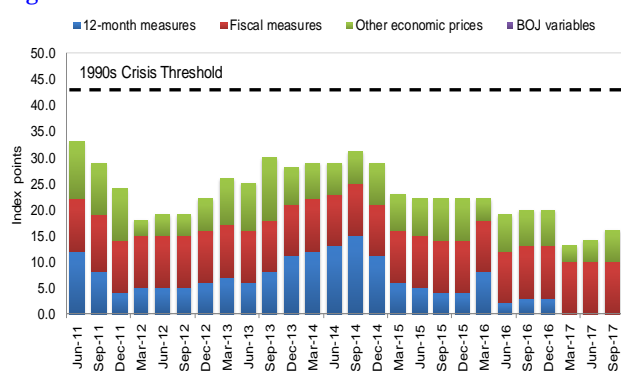
Note: The domestic macroeconomic environment, financial market conditions and the global environment indicators identify the systemic shocks that would trigger major difficulties for financial institutions. The capital & profitability and the funding & liquidity indicators reflect the capacity of financial institutions to absorb a shock to either side of their balance sheets. Movements away from the centre of the diagram represent an increase in financial stability risks. Movements towards the centre of the diagram represent a reduction in financial stability risks.

Figure 2.8 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, WECE - World Economic Climate Index.

Figure 2.9 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.

Overall liquidity conditions deepened over the review period (see **Figure 2.5**). This was reflected in the narrowing of the average monthly TRE spread which was -0.1 per cent comparing favourably to 0.1 per cent for 2016. With sustained improvements in Jamaica's economic and financial conditions, investors' confidence in GOJ global bonds continued to rise in 2017. In particular during 2017 the spread between GOJGB and the Emerging Market Bond Index (EMBI+) continued to decline over the review period (see **Figure 2.6**).

2.3.1 Cobweb measure of financial stability

The financial stability cobweb showed a general reduction of risk exposures for 2017 with the exception of the capital & profitability, and funding & liquidity dimensions (see **Figure 2.7**). Capital & Profitability and Funding & Liquidity dimensions showed no change for the review period relative to 2016. The reduction of risk exposure from the domestic environment for 2017 was largely attributable to improvements in the unemployment rate, external debt to GDP and the domestic mortgage loans to total household debt ratio. In addition, reduction in risks from the global environment resulted from improvements in global employment and the spread between GOJ global bonds and the EMBI+. The reduction in risk exposure for the financial market was against the backdrop of a strong stock market performance on both the domestic and global financial markets for 2017.

2.3.2 Macro-Composite Indicators of Financial Stability³

Macro-composite indicators of financial stability showed positive results over the review period. Domestic financial conditions, as measured by the AFSI⁴, displayed signs of increased stability for the review period. Specifically, the AFSI grew by 13.4 per cent to a quarterly average of 0.61 relative to 0.54 for 2016 (see **Figure 2.8**).

³ The MaFI is an early warning composite indicator. The current period value of various indicators are compared relative to tranquil period mean values. The number of standard deviations away from the mean is then used to assigning risk scores of 1-5. [http://boj.org.jm/pdf/An_Early_Warning_System_for_Economic_and_Financial_Risks_in_Jamaica_\(2017\).pdf](http://boj.org.jm/pdf/An_Early_Warning_System_for_Economic_and_Financial_Risks_in_Jamaica_(2017).pdf)
⁴ 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

Of note, the index is at its highest level relative to prior years.

Growth in this index was mainly driven by improvements in the financial soundness and financial development sub-components of the AFSI. Specifically, the favourable outturn in the financial soundness sub-component was attributed to positive developments in bank solvency and loan quality. Additionally, improvements in the interest rate spread, stock market capitalization and the Herfindahl-Hirschman Index asset concentration for the DTI sector contributed to the stronger performance of the financial development sub-index. There was however, deterioration in financial vulnerability conditions which was influenced by weaker quarterly averages for the domestic inflation rate and the current account deficit, specifically attributed to the third quarter of 2017.

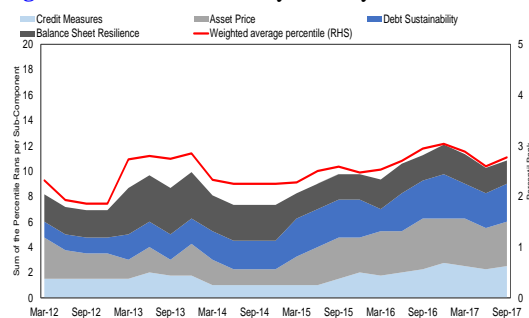
The composite indicator capturing macro-economic conditions (the MaFI) showed substantial improvements for the first three quarters of 2017. The quarterly average value of the MaFI fell to 14.3 points relative to 20.3 points for 2016 and continued to remain well below the 1996-1998 financial crisis threshold value of 44.0 points (see **Figure 2.9**). This outturn mainly reflected improvements in the signal from the 12-month growth in the stock market index, 12-month private sector credit growth and measures of the volatility in the exchange rate.

2.4 Measures of Financial Cycle

Within the context of a relatively stable domestic macroeconomic environment there was general improvement in the cyclical systemic risk for 2017 (see **Figure 2.10**).⁵ However, cyclical developments did include strong growth in credit. In addition, for the review period, there were increases in the ratios of household debt to GDP, household debt to disposable income as well as non-financial corporate debt to GDP.

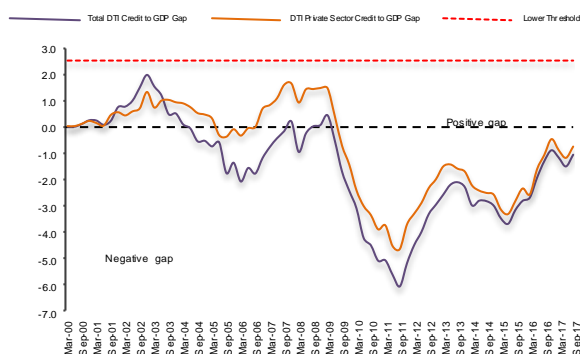
⁵ Cyclical risk areas include: (i) credit growth measures; (ii) asset price; (iii) debt sustainability and (iv) balance sheet resilience.

Figure 2.10 Evolution of cyclical systemic risk



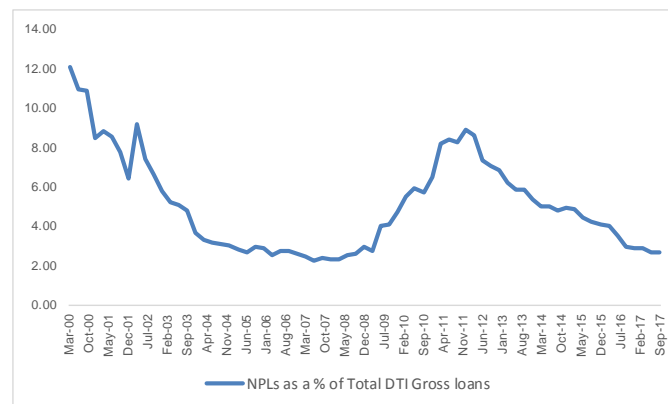
Note: The cyclogram is an aggregation of core variables that illustrate the build-up of vulnerabilities in the financial cycle, based on Objective one and two of the FSSC mandate. The evolution of cyclical systemic risk is measured by comparing each of the various macro-prudential risk components to its historical empirical cumulative distribution function. A number between 1 and 4 (where a value of 1 signals less risk) is assigned to the actual value of the variable depending on its position in respective quantiles of its historical distribution. The simple average of the ranks for each variable is used to find the aggregate values for the cyclogram. The weighted average percentile rank takes into account the contribution of each risk category to overall systemic risk.

Figure 2.11 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 2.12 Non-performing loans to total loans



2.4.1 Credit-to-GDP Gap and Financial Sector Leverage

DTI credit grew by 8.6 per cent for the first three quarters of 2017 while credit issued to the private sector grew by 9.5 per cent.⁶ This occurred against the background of favourable domestic credit conditions, which partly reflected BOJ’s continued easing of monetary policy and the credit growth was not deemed excessive (see **Figure 2.11**). Additionally, there was sustained reduction in the credit risk exposure as reflected in the decline of non-performing loans to total loans in 2017 (see **Figure 2.12**). This reflects continued improvements in the loan quality of the private sector.

Against the backdrop of strong credit growth, there was an absence of any significant expansion in leverage in the financial system (see **Figure 2.13**). Leverage metrics for life insurance companies, DTIs and SDs decreased which was attributable to a larger increase in equity relative to total financial assets and off-balance sheet exposures⁷. While general insurance companies showed increased leverage at end-September 2017 when compared to end-2016 due to a larger increase in total financial assets and off-balance sheet exposures relative to equity.

2.4.2 Maturity and Liquidity Transformation

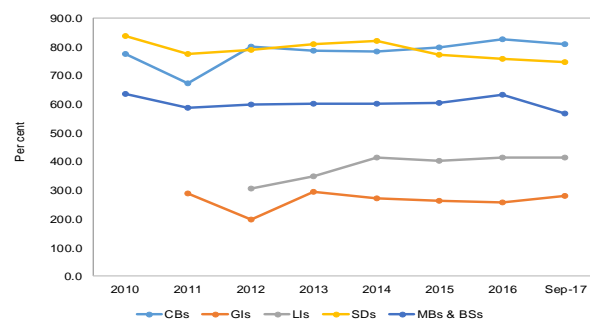
Risks emanating from the mismatch of the maturity of short-term assets and liabilities decreased for the period across all subsectors except for life insurance companies, building societies and merchant bank (see **Figure 2.14**). The extent of maturity transformation conducted by commercial banks and securities dealers⁸ decreased for 2017. However the extension in the maturity transformation metrics for life insurance companies reflected a greater percentage increase in their short-term liabilities relative to their short-term assets.

⁶ Domestic credit includes domestic loans and advances as well as corporate and government issues held by deposit-taking institutions

⁷ SD leverage metric does not contain off-balance sheet exposures, therefore decrease is attributable only to a larger increase in equity relative to total financial assets.

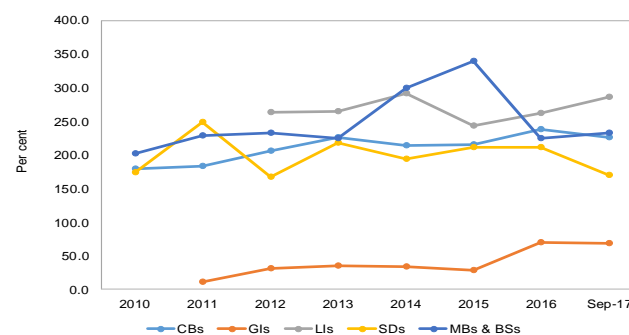
⁸ Metrics on SD positions comprises data of twelve SDs in the sector.

Figure 2.13 Leverage metric – DTIs, SDs and insurance companies



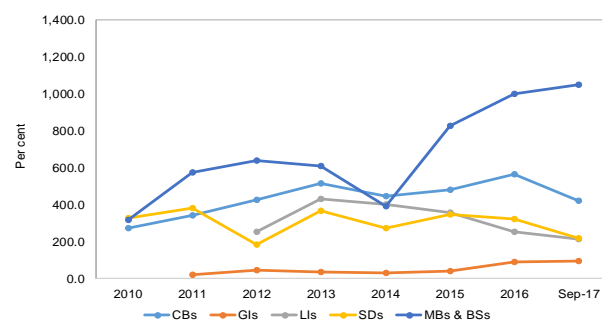
Note: Leverage is calculated as total financial system assets plus total off balance sheet assets to equity. While for SDs leverage was calculated as total financial system assets to equity.

Figure 2.14 Maturity transformation (short-term) – DTIs, SDs and insurance companies



Note: This is calculated as short term liabilities [≤ 30 days] plus redeemable equity [≤ 30 days]) to short term assets [≤ 3 months].⁹

Figure 2.15 Liquidity transformation – DTIs, SDs and insurance companies



Note: This is calculated as short term liabilities [≤ 30 days] to liquid assets [broad]. Liquid assets are considered all assets that can be easily and immediately converted into cash at little or no loss of value. In Jamaica’s case, the broad liquid asset measure cover cash and equivalents, GOJ/US/CAN/EURO government securities due in less than 3 months and equities listed in stock exchanges of developed countries.

⁹In response to the Bank’s foreign currency policy as it relates to cash reserve requirements and liquid assets ratio, DTIs have been holding more liquid assets and securities.

Figure 2.16 Micro-prudential index for DTIs

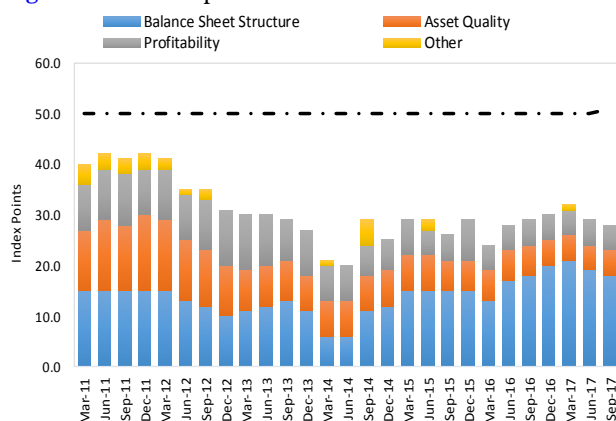
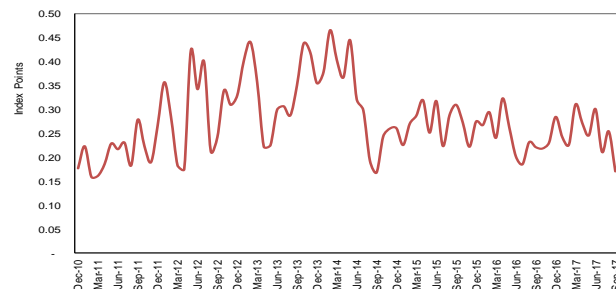
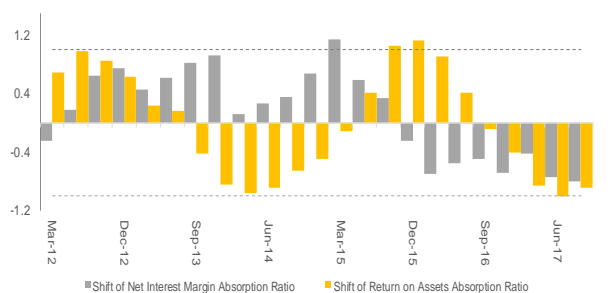


Figure 2.17 Composite indicator of systemic stress¹⁰



Note: The CISS measures the joint impact of activity in the money market, equity market, bond market and foreign exchange market. An increase in the CISS indicates a high degree of correlation between markets which aggravates systemic risk. When the correlation between markets is low the risk is reduced.

Figure 2.18 Shift in absorption ratio



Note: The absorption ratio (AR) measures the fraction of the covariance in returns explained by the largest direction of covariance over the past 18 quarters. Increases in AR reflects stronger system-wide comovement of commercial bank returns. The shift in the AR is calculated as the difference between the 4 quarter average AR and the 12 quarter average AR as a share of the 12 quarter standard deviation of the AR. A shift in the AR approaching a magnitude of 1 is used as a benchmark for identifying periods of increased fragility.

¹⁰[http://www.boj.org.jm/pdf/A_Composite_Indicator_of_Systemic_Stress_\(CISS\)_The_case_of_Jamaica_\(2014\).pdf](http://www.boj.org.jm/pdf/A_Composite_Indicator_of_Systemic_Stress_(CISS)_The_case_of_Jamaica_(2014).pdf)

Regarding liquidity transformation, the extent of coverage of short term liabilities with liquid assets increased for 2017 relative to 2016 (see **Figure 2.15**). This was reflected in slower growth in short-term liabilities relative to liquid assets. Furthermore, the liquidity transformation risk metrics for merchant banks and building societies continued to trend above the other subsectors.¹¹

2.4.3 Micro-Composite Indicator of Financial Stability¹²

The composite indicator based on financial institutions' operational activity (the MiPI) deteriorated slightly to 29.7 points for the first three quarters of 2017 relative to 27.8 points for 2016 but remained far below the 1996-1998 financial crisis threshold value of 50.0 points (see **Figure 2.16**). This outturn reflected deterioration of indicators mainly in the balance sheet structure. These included a decline in the share of deposits to assets and loans to financial institutions as a share of total loans. Deteriorations in the index were, however, marginally offset by an improvement in the average quarterly signal for indicators from the asset quality category. Specifically, non-performing loans to assets improved during 2017 relative to 2016.

2.5 Measures of direct and indirect exposure concentration

2.5.1 Exposure to financial markets

The co-movement of domestic financial markets for 2017 declined, as measured by the CISS. The index fell to a monthly average of 0.17 for the first three quarters of 2017 compared to a monthly average of 0.28 for 2016 (see **Figure 2.17**). This was primarily due to the reduction in exposures from the foreign exchange and money markets, which offset the increased exposure to returns in the bond and equity markets.

Concurrently, there was easing in the joint movement of commercial banks' performance in 2017 relative to 2016.¹³

¹¹ Traditionally merchant banks and building societies issue long-term loans, resulting in them holding a small amount of liquid assets in comparison to short-term liabilities.

¹² The MiPI is an early warning composite indicator. The current period value of various indicators are compared relative to tranquil period mean values. The number of standard deviations away from the mean is then used to assigning risk scores of 1-5.

Figure 2.19 Quarterly distance-to-default for DTIs and non-deposit taking financial institutions

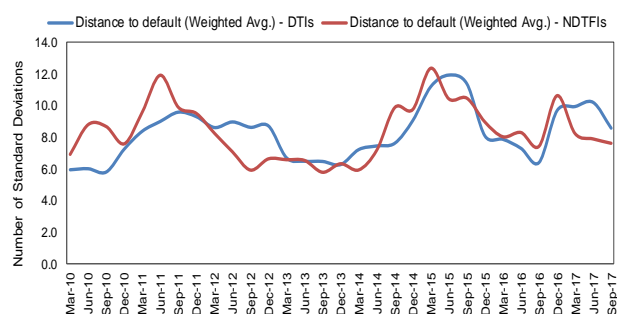


Figure 2.20 Ratio of holdings of total GOJ debt by DTIs, SDs and life insurance companies to capital

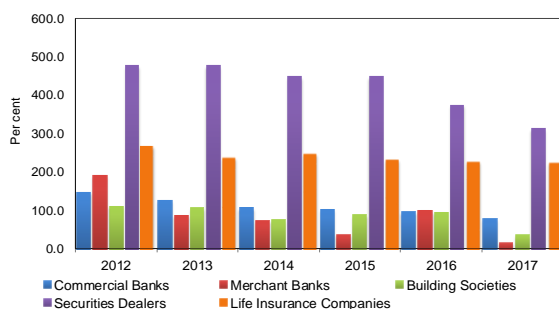
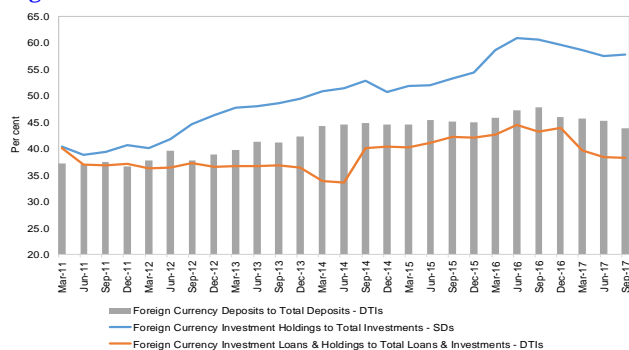


Figure 2.21 Dollarization trends



¹³ The absorption ratio (AR) uses principal components analysis to measure the fraction of the covariance in returns explained by the largest direction of covariance over the past 18 quarters. Increases in the AR implies greater co-movement in performance. A shift of 1 standard deviation is used as a benchmark of significance. http://www.boj.org.jm/uploads/pdf/papers_pamphlets/papers_pamphlets_The_Absorption_Ratio_as_an_Indicator_from_Macro-prudential_Monitoring_in_Jamaica.pdf

Based on calculated absorption ratios, there were declines in quarterly co-dependence across institutions' profitability measures at end-September 2017 compared to end-2016 (see **Figure 2.18**).

2.5.2 Exposure to default risk

The distance-to-default for DTIs decreased to 8.6 standard deviations from the default barrier at end-September 2017 relative to 9.7 standard deviations at end-2016 (see **Figure 2.19**). This deterioration was associated with lower expected returns, especially in the third quarter as well as higher volatility in returns. However, DTIs did experience large growth in market values which allowed default risk to be stable for the first two quarters of the review period.

Similarly, the distance-to-default for the NDTFIs continued to decline over the review period, reflecting an increase in default risk across the sector. Of note, it decreased to a quarterly average of 7.9 standard deviations from the default barrier for the calendar year to September 2017 relative to 8.6 standard deviations for 2016.¹⁴

Up to end-September 2017, there was a general decline in risk related to the exposure of the banking system to sovereign debt default, as measured by the ratio of holdings of GOJ debt to capital (see **Figure 2.20**). Specifically, the ratios for SDs and commercial banks decreased to 312.1 per cent and 76.8 per cent relative to 373.3 per cent and 93.6 per cent for 2016, respectively. While the ratios for merchant banks and building societies decreased to 15.1 per cent and 34.2 per cent relative to 98.3 per cent and 92.7 per cent for 2016, respectively. Of note, reductions in the risk exposure for merchant banks and building societies were due to the downsizing of both sectors in 2017 while the commercial bank sector increased in size.¹⁵ Conversely, life insurance exposure to sovereign debt default risk remained marginally unchanged for the review period in comparison to 2016.

¹⁴ The distance-to-default measures the distance (in standard deviation) of an institution's contingent assets to its default barrier (which is defined as the sum of short-term liabilities and one-half long-term liabilities). http://www.cmf-uwj.org/files/publications/journal/2012_2_7/1_22.pdf

¹⁵ One merchant bank and one building society both became commercial banks in 2017.

2.6 Measures of interconnectedness & systemic importance

2.6.1 Misaligned incentives

Financial dollarization decreased during 2017 due to strengthened domestic macroeconomic conditions, movement in the domestic exchange rate and the increase in DTIs' foreign currency reserve requirements (see **Figure 2.21**).

The average share of DTIs' foreign currency deposits to total deposits declined to 45.0 per cent at end- September 2017 from 47.0 per cent at end-2016. Similarly, the ratio of foreign currency investments holdings to total investments declined by 3.4 per cent for SDs to 58.0 per cent during the review period. Given the improved levels of financial dollarization for DTIs and SDs, the financial sector was marginally less exposed to, *inter alia*, currency mismatch risk and credit risk from foreign currency lending to un-hedged borrowers.

With regard to interconnectedness, analysis of reported inter-institution exposures show large exposures of SDs to DTIs. On average, SDs' funding to DTIs valued 16.1 per cent of their total assets. SDs in a similar manner provided a significant amount of funding to other SDs valuing 7.2 per cent of assets. These exposures resulted in average funding by SDs to DTIs and SDs totaling 23.3 per cent of assets.

This exposure to other financial sectors was in contrast to that reported by DTIs with average funding to SDs and DTIs of 5.6 per cent in total. DTIs' largest exposure to other financial sectors was dominated by their funding from SDs. On average, funding from SDs totaled 5.9 percent of DTI assets. This ratio was skewed by two DTIs who reported funding from SDs as large as 24.8 per cent of total assets (see **Figure 2.22**).

DTIs do however show greater exposures to related companies. On average funding to a related party by a DTI was approximately 7 per cent of assets as at end September 2017. Three DTIs skewed the ratio of exposure to affiliated

Figure 2.22 Reported exposures (% of sector's total assets)

	SDs	Insurance	DTIs	Foreign
DTIs' Average Funding From	5.9%	2.5%	1.3%	4.7%
DTIs' Average Funding to	2.8%	0.1%	2.8%	12.2%
SDs' Average Funding From	2.5%	4.0%	3.0%	4.9%
SDs' Average Funding To	7.2%	0.0%	16.1%	3.1%

Figure 2.23 DTIs' exposures to related institutions

Total Funding from Related Companies		Total Funding to Related Companies	
	% of Balance Sheet Capital		% of Balance Sheet Capital
% of Total Assets	7.0%	% of Total Assets	6.1%
	34.9%		30.8%

companies, with reported funding as high as 24.8 per cent for the review period (see **Figure 2.23**).

2.6.2 Systemic importance

As it relates to the systemic importance of institutions within the financial system, there was an increase in the number of systemically important banking groups to three at end-September 2017 relative to two at end-2016.¹⁶

Consequently, total SIFI group assets as a share of total financial system assets increased to 64.3 per cent at end-September 2017 relative to 48.2 per cent at end-2016. This outturn highlighted growth in the degree of concentration

¹⁶ The score for banking group *i* for period *j* is computed as follows:

$$SCORE_{ij} = \frac{A_{ij}}{\sum_i^n A_{ij}} + \left(\frac{(LFC_{ij} + DFC_{ij})}{(\sum_i^n LFC_{ij} + \sum_i^n DFC_{ij})} \right) + \left(\frac{(LH_{ij} + LNFC_{ij} + LGG_{ij} + LCS_{ij})}{(\sum_i^n LH_{ij} + \sum_i^n LNFC_{ij} + \sum_i^n LGG_{ij} + \sum_i^n LCS_{ij})} \right) + \left(\frac{(TS_{ij} + IS_{ij})}{(\sum_i^n TS_{ij} + \sum_i^n IS_{ij})} \right)$$

where, A represents total resident assets, LFC represents loans to financial corporations, DFC represents deposits from financial corporations, LH represents loans to households, LNFC represents loans to non-financial corporations, LGG represents loans to the general government, LCS represents loans to community service and non-profit organizations, TS represents trading securities and IS represents investment securities. See: [http://www.boj.org.jm/pdf/Do_Jamaican_Domestic_Systemically_Important_Financial_Institutions_have_a_Deposit_Rate_Advantage_\(2014\).pdf](http://www.boj.org.jm/pdf/Do_Jamaican_Domestic_Systemically_Important_Financial_Institutions_have_a_Deposit_Rate_Advantage_(2014).pdf)

and the potential for contagion risks as well as the need to effectively monitor the developments related to these groups.¹⁷

2.7 Stress testing results

With regards to stress testing the financial system, the Bank's stress testing results indicated that DTIs continued to withstand hypothetical liquidity, market, and credit shocks as there was reduced exposures and stronger capital positions during 2017. However, SDs remained susceptible to interest rate risks but there was reduced vulnerability to hypothetical interest rate shocks relative to 2016. Additionally, SDs exhibited reduced vulnerability to combined hypothetical shocks while insurance companies continued to show resilience to these shocks. (see **Chapter 5**).

¹⁷ Refer Bank of Jamaica 2016 Annual Report. A framework for consolidated supervision was introduced by the Banking Services Act such that each financial group to which a DTI belongs, is structured in a way which facilitates effective consolidated supervision.

Box 2.1 Assessing Systemic Risks Associated with Financial Cycles

Financial cycles often include a collective over-optimism of market participants, resulting in excessive risk taking during the expansion phase. Associated consequences to real activity are then often reflected by inflated asset prices, extended leverage and balance sheet maturity mismatch. When at or near peak conditions asset prices are over inflated, debt levels are high, or balance sheets are illiquid. As a result, the system becomes increasingly vulnerable to shocks.

The framework for assessing systemic risk associated with the financial cycle therefore, aims to identify periods of abnormal credit conditions based on predetermined thresholds. Additionally, it attempts to determine the extent of pro-cyclicality by including an assessment of the financial vulnerability in the real economy and the “stretch” within the financial sector.

Since the financial cycle is not a mechanically recurrent or deterministic feature of the economy, the framework then requires policy judgement based on the quantitative and qualitative information at hand.

Abnormal Credit Conditions

Credit-to-GDP gap ratios are useful for signaling the build-up of excessive leverage in the macroeconomy. It measures deviations of the credit-to-GDP ratio from a long-term trend derived from the one-sided Hodrick-Prescott filter. When the gap is positive, credit is outpacing growth in the real economy.

Two variations of the credit-to-GDP gap ratio are calculated and analyzed, the private sector credit-to-GDP gap and the total credit-to-GDP gap. Private sector credit includes loans and advances extended by DTIs plus the value of corporate securities held. Total credit comprises all aspects of private credit but also includes DTIs’ loans and advances to the public sector. The credit balances are then taken as a ratio to the four-quarter moving sum of nominal GDP.

Similarly, in addition to credit-to-GDP gap statistics, the framework assesses the nominal annual growth rate of credit to help identify the upswing of the financial cycle. The growth in credit may reflect, more quickly than the credit-to-GDP gap, a turn in the financial cycle.

Vulnerability in the Real Economy – Multipliers of Concern¹

Risks associated with financial cycles are systemic when simultaneously occurring with increasing vulnerabilities within the real economy. Therefore, the assessment of systemic risks associated with the financial cycle requires the inclusion of analysis of related developments in the real economy. Related areas include the identification of the presence of asset price booms, and/or whether the financial system is susceptible to an over-levered private and financial sector.

High lending and excessive market liquidity may increase asset prices as collateral values become inflated. This dynamic fuels market pro-cyclicality as inflated asset prices may fuel a further expansion of credit. A sudden reversal of asset prices may then result in losses for the financial sector. Such correlation between asset prices and credit reflect the potential for spillover effects between the real economy and the financial system, from contractions of financial conditions to a bust in asset prices.

Table 1. Partial correlation of credit and residential property price indices

	<i>All Jamaica Price Index</i>	<i>Kingston & St. Andrew Price Index</i>
Credit to Non-financial Corporates	0.24	0.39
Personal Credit	0.31	0.26
Private Sector Credit	0.45	0.46
Total Credit-to-GDP Gap	0.45	0.48

One multiplier of concern occurs when there is excessive credit market conditions with a simultaneously high rate of growth in real asset prices. The framework measures real asset price developments by estimating residential property price indices. Real estate price developments are summarized by the annual growth in the property price index and by deviations in real property prices from their long-term trend values.

Systemic risks associated with the financial cycle are elevated if there are significant feedback loops due to debtor weakness and financial sector weakness. High leverage or high debt burdens magnify vulnerabilities to changes in lending or economic conditions and therefore reduces resilience to economic and financial shocks. Potential spillovers to the wider

¹ The framework coins the term multiplier of concern to indicate those aspects of the real economy that magnifies the significance of abnormal credit conditions.

economy from pro-cyclicality of the financial cycle, can be measured based on household and non-financial corporates' debt burden. As such, a second multiplier of concern is the debt burden of household and non-financial corporates.

This vulnerability is measured using debt-to-income and debt-to-GDP ratios. More specifically, household debt is the sum of consumer and mortgage loans issued by DTIs, while income is calculated using national income statistics on disposable income. Corporate debt and income is measured as non-financial sector loans issued by DTIs and operating surplus, respectively (see **Chapter 4**).

Systemic risk due to feedback loops is as well a function of financial sector soundness. A well-capitalized financial sector with strong liquidity positions is better able to absorb shocks from financial contractions. On the other hand, a stretched financial sector will be less resilient to the potential downturn. A stretched financial sector, that is, one with high levels of leverage and a large and expanding maturity mismatch, will fuel the credit cycle and exacerbate systemic risks associated with pro-cyclicality.

A third multiplier of concern is a concurrent expansion of leverage and financial balance sheet transformation. This vulnerability is measured by leverage ratios and transformation ratios for both DTIs and SDs (see **Chapter 2**).

Analytical Approach

The framework requires a two-step approach in its assessment of systemic risk. First, an analysis of credit conditions and the determination of excessive credit growth. Secondly, an assessment of concurrent vulnerabilities in the real economy.

The credit condition is defined as excessive once it surpasses pre-calibrated thresholds for each indicator. Thresholds for Jamaica are created by examining the distribution of positive credit-to-GDP gaps during a normal cycle period. The mean and standard deviation of these positive gaps is then calculated for the period. The threshold for the credit-to-GDP gap is then determined as the value of three standard deviations away from the mean. Based on this approach a threshold of 2.5 per cent for the credit-to-GDP gap and a threshold of 25 per cent annual growth in total credit are obtained.

The severity of systemic risk associated with the financial cycle is partly informed by developments in the real economy. Vulnerabilities in the real economy are based on a historic comparison of the level and or growth of indicators associated with each multiplier of concern. That is, quarterly values of each indicator in the time series is ranked in its historical

empirical distribution. Five bands of percentiles are then used to produce a heat map of relative standing.

Expert Judgement

The framework attempts to best obtain a proxy for the cycle, associated pro-cyclicality and subsequent resilience of the real economy. Given the challenges inherent in quantitative systemic risk assessment and the fact that financial conditions are a function of changing economic policies, there is a key role of expert judgement.

Such expert judgment will be guided by the developments of the assessed indicators. However, qualitative information is being considered when determining whether an indicator is signaling elevated risk. In addition, judgement will account for risk tolerance of policy makers and the general economic and financial context within which market participants operate.

3. Financial System Developments

3.1 Overview

For the calendar year to end September 2017, the asset base of both the DTI and NDTFI sectors showed continued expansion.¹

Institutions within the DTI sector demonstrated continued positive performance in terms of profitability, capital adequacy and liquidity. Notably, asset quality showed continued improvement with the NPL ratio declining over the review period.

The performance of the securities dealers was influenced by growth in funds under management of these institutions, partially due to expanded product offerings which include CIS.² Additionally, there was a slight deterioration of the capital adequacy ratio for the sector and increased sensitivity to foreign exchange risk.

For the insurance sector, the sector maintained satisfactory levels of solvency and capital adequacy. The profitability metrics for the sector also showed mixed results, however, the insurance penetration remained flat.

3.2 The Financial System

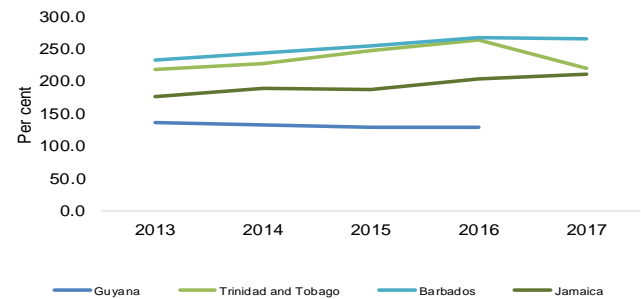
During 2017, there was a deepening of the financial system, as measured by total financial institutions' assets as a share of GDP (see **Figure 3.1**). The ratio increased to 210.5 per cent at end-September 2017 relative to 203.5 per cent at end-2016. This performance was due to faster growth in assets relative to growth in GDP.³

¹ Non-Deposit Taking Financial Institutions include pension funds, collective investment schemes, securities dealers, life insurance companies and general insurance companies.

² There was a change in the reporting requirements of CIS which would have also contributed to the increase in the reported funds under management.

³ During 2017, the growth of financial assets in real terms was 4.9 per cent.

Figure 3.1 Depth of financial intermediation
(assets of financial corporations as % of GDP)



Source: Regional Central Banks

Figure 3.2 Growth in market shares in DTI assets
(growth between end-2016 and end-September 2017)⁴

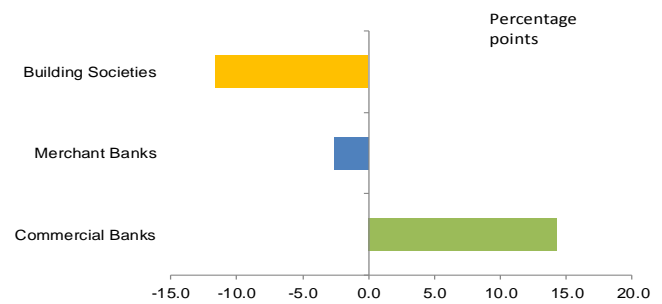
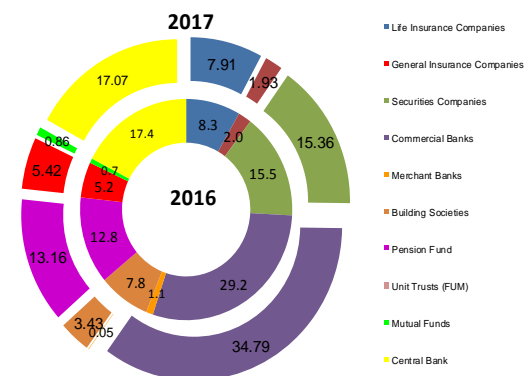


Figure 3.3 Market share in financial system assets⁵



⁴ DTIs include commercial banks, building societies and a merchant bank. Securities dealers' assets represent the thirty-two core dealers.

⁵ Assets are defined as total balance sheet assets.

Figure 3.4 Distribution of major asset categories as a share of total DTIs’ assets

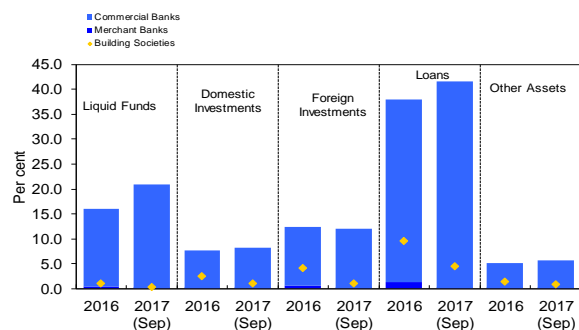


Figure 3.5 Major components of DTIs’ aggregate balance sheet as end-2016 and end-September 2017

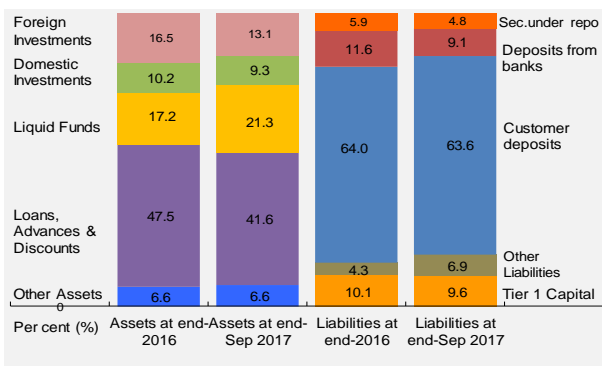
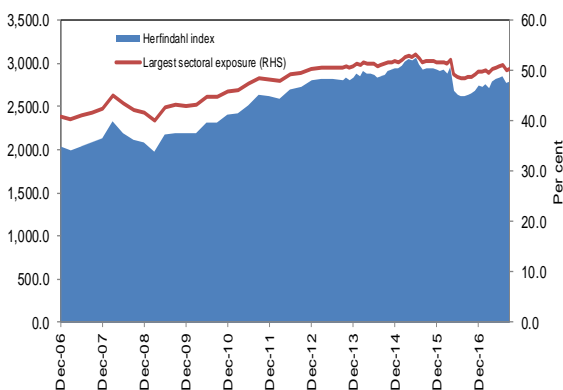


Figure 3.6 Concentration of DTIs’ loan portfolio to private sector (HHI 0-10,000)



3.3 DTIs

3.3.1 Market share of DTIs

Commercial banks remained the dominant subsector within the DTI sector. The market share of commercial banks, in terms of asset base, increased to 90.9 per cent at end-September 2017, relative to 76.7 per cent at-end 2016.⁶ While the market share of building societies and merchant banks declined by 11.6 and 2.6 percentage points to 9.0 per cent, and 0.1 per cent, respectively (see **Figure 3.2**). Concurrently, commercial bank assets as a percentage of overall financial system assets increased to 34.8 per cent at end-September 2017 (see **Figure 3.3**).⁷ These developments were largely as a result of two institutions already in the DTI sector receiving commercial banking licenses.

3.3.2 DTIs’ balance sheet position

DTIs’ total assets grew by 12.9 per cent to \$1 493.6 billion at end-September 2017 relative to end-2016. This performance compares to growth of 13.5 per cent for 2016. For the review period, asset growth was primarily due to loans, advances and discounts. Loans, advances & discounts reflected an increase of 8.5 per cent in domestic loans and an increase of 2.6 per cent in foreign currency loans. At the same time, the holdings of investments reduced by 28.2 per cent for the review period. This was primarily due to a decline in foreign investments of 28.3 per cent (see **Figure 3.4** and **Figure 3.5**). Moreover, DTIs’ net open position to capital ratio increased by 5.0 percentage points to 8.5 per cent at-end September 2017 relative to end-2016.

Regarding concentration in private sector lending, the Herfindahl-Hirschman Index (HHI) increased by 1.6 per cent to 2 788.4 for the nine-month period to end-September 2017 (see **Figure 3.6**).⁸ Furthermore, DTI

⁶ Notably, DTIs asset base grew 6.3 per cent in real terms.

⁷ Credit unions were not included in the analysis over the review period.

⁸ The Herfindahl-Hirschman Index (HHI) is a measure of concentration and is calculated by squaring the loan share of each sub-sector within the private sector loan market, and then summing

loans continued to be concentrated within the domestic household sector. Specifically, household sector loans as a proportion of total loans increased by 0.8 percentage points to 50.4 per cent at end-September 2017 relative to end-2016 (see **Table 3.1**). Also, DTIs' other significant exposures in the lending market were to *Distribution* (8.7 per cent), *Tourism* (7.3 per cent), *Overseas residents* (6.3 per cent) and *Professional Services* (5.4 per cent) at end-2016 (see **Table 3.1**).⁹

DTIs' credit portfolio continued to reflect high concentration levels with 77.0 per cent of credit extended to the private sector as at end-September 2017. Private sector credit was channeled to three main economic sectors, namely *Distribution*, *Tourism* and *Household sector*. A Lorenz curve analysis showed that 30.0 per cent of DTIs (three institutions) accounted for over 60.0 per cent of loans extended to the *Distribution* and *Households sectors*. With respect to the personal loans and tourism sector loans, there was a slight increase in the number of DTIs that extended credit to these two loan categories between 2010 to September 2017 (See **Figure 3.8**).

At end-September 2017, the share of loans of these three DTIs was 77.4 per cent of DTI total private sector credit relative to 75.1 at end 2016. This uptick was largely influenced by increased lending to the distribution sector of 15.4 per cent. However, lending to the tourism sector by these three DTIs decreased by 9.3 per cent during the review period.

Asset quality for DTIs, as measured by NPLs as a share of total loans, continued to improve for the first three quarters of 2017. This ratio declined to 2.7 per cent at end-September 2017 relative to 2.9 at end-2016.

Figure 3.7 Share of Private Sector Credit by top three (3) DTIs

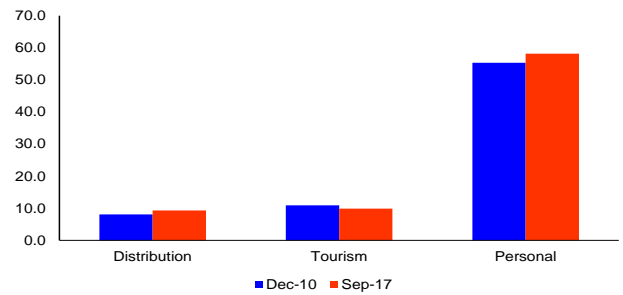
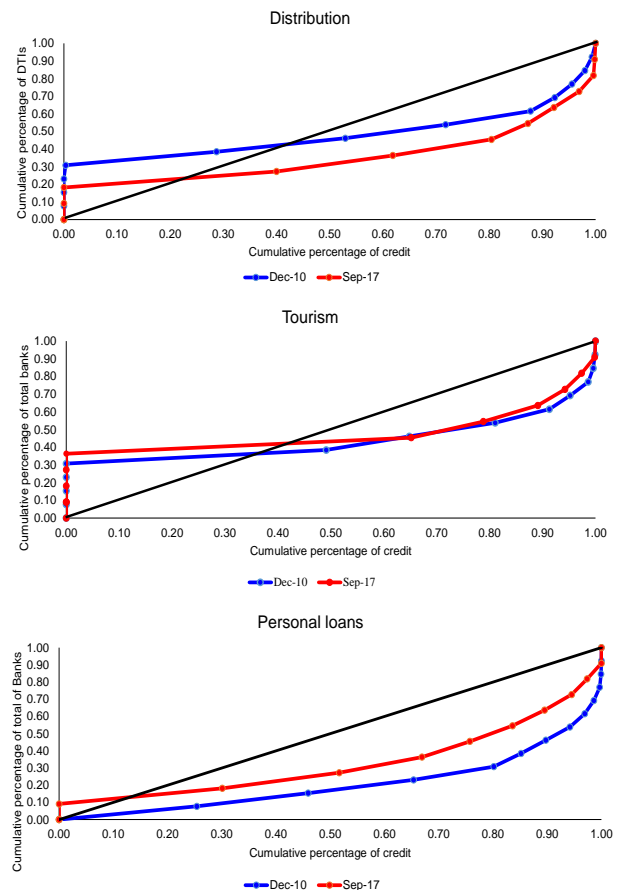


Figure 3.8 Distribution of credit by DTIs



the resulting numbers. The HHI index can range from close to zero to 10 000.

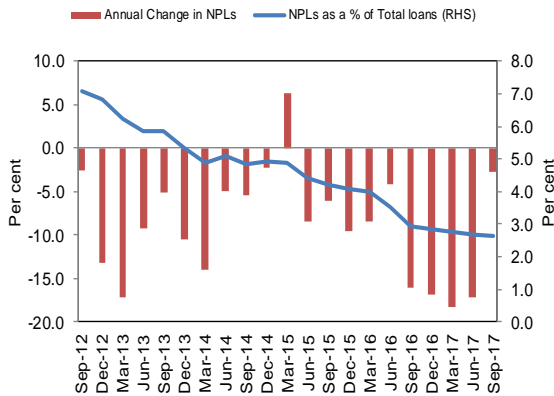
⁹ With respect to table 3.1, darker areas indicate higher concentration.

Table 3.1 Concentration of DTIs loan portfolio

Per cent	2013	2014	2015	2016	2017 (Sep)
AGRICULTURE & FISHING					
CONSTRUCTION & LAND DEV.					
DISTRIBUTION					
ELECTRICITY					
ENTERTAINMENT					
FINANCIAL INSTITUTIONS					
MANUFACTURING					
MINING, QUARRYING & PROC.					
PERSONAL NON BUS. LOANS TO INDIVS.					
PROFESSIONAL & OTHER SERVICES					
OVERSEAS RESIDENTS					
TOURISM					
TRANSPORT, STORAGE & COMM.					
PUBLIC SECTOR					

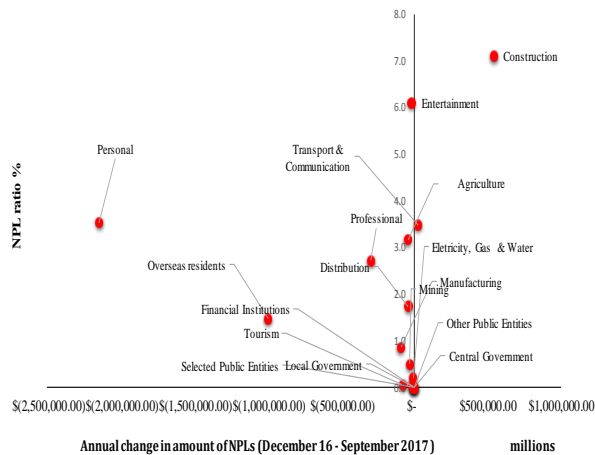
This development was largely due to a 2.7 per cent decline in NPLs relative to a decline of 16.1 per cent for 2016 (see **Figure 3.9**). Similarly, there were improvements in sectoral asset quality across most sectors. In particular, the personal loans sector had the most significant dollar value decline in NPLs while the construction sector accounted for the highest NPL ratio. The improvement in asset quality resulted from net repayments and net write-offs within the NPLs portfolio of commercial banks, primarily in the personal loans sub-sector (see **Figure 3.10**).

Figure 3.9 NPLs in the DTI sector



The NPL coverage ratio increased to 121.6 per cent at end-September 2017 from 116.6 per cent at end-2016 and continued to remain well above the full coverage of 100.0 per cent.¹⁰ Notwithstanding, there was a decrease in the median NPL coverage ratio to 88.7 per cent at end-September 2017 relative to 108.9 per cent at end-2016 (see **Figure 3.11** & **Figure 3.12**). Loan loss provisions as a percentage of total loans decreased to 3.3 per cent at end-September 2017, relative to 3.4 per cent at end-2016.¹¹ The reduction in loan loss provision was due to lower NPLs reflecting continued improvements in borrowers' capacity to repay their obligations over the review period (see **Figure 3.11**).

Figure 3.10 Sectoral asset quality of DTIs



Liquidity conditions continued to be adequate within the DTI sector during the nine-month period to end-September 2017, with liquid asset reserves in excess of the minimum statutory requirement which stood at 36.9 per cent.¹² Correspondingly, the ratio of liquid assets to

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 plus prudential provisions for expected losses based on regulatory criteria as a ratio to NPLs.

¹¹ Loan loss provisions are 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. It is calculated as provisions of impairment under the International Financial Reporting Standards plus prudential provisions as a percentage of total loans.

¹² DTIs are required to hold reserves amounting to 26.0 per cent of their average domestic currency prescribed liabilities in the form of liquid assets at the Bank of Jamaica.

total assets increased marginally to 25.9 per cent at end-September 2017 relative 25.3 per cent at end-2016. The increase in the ratio was due mainly to DTIs' increased growth in liquid assets relative to the total asset base, particularly within the commercial banking sub-sector (see **Figure 3.13**).

Funding from deposits continued to represent DTIs' main source of asset financing. Total deposits increased by 14.9 per cent to \$979.9 billion, representing 76.6 per cent of total liabilities at end-September 2017 relative to 75.9 per cent at end-2016. Moreover, total loans as a share of deposits which is a measure of financial intermediation decreased to 70.2 per cent at end-September 2017 relative to 73.3 per cent at end-2016. This contributed to relative stability in funding risk at end-September 2017 (see **Figures 3.14** and **3.15**).¹³

The average CAR for DTI sector increased to 18.6 per cent at end-September 2017 relative to 16.8 per cent at end-2016 (see **Figure 3.16**). The quality of regulatory capital, as measured by the ratio of Tier 1 capital to total regulatory capital, decreased from 99.7 per cent at end-September 2017 relative to 91.6 per cent at end-2016. Consistently, there was reduction of non-distributable retained earnings relative to capital to 37.9 per cent at end-September 2017 relative to 55.7 per cent at end 2016. Similarly, the Tier 1 capital to risk weighted assets ratio increased to 16.1 per cent from 15.1 per cent at end-2016.

3.3.3 DTIs' earnings and profitability

For the calendar year ending September 2017, DTIs recorded net profits of \$38.9 billion. Specifically, DTIs had an operating income of \$142.6 billion which was 23.4 per cent higher than the corresponding year ending September 2016. In particular, operating profits

Figure 3.11 Loan loss provisioning rate and NPL coverage DTIs

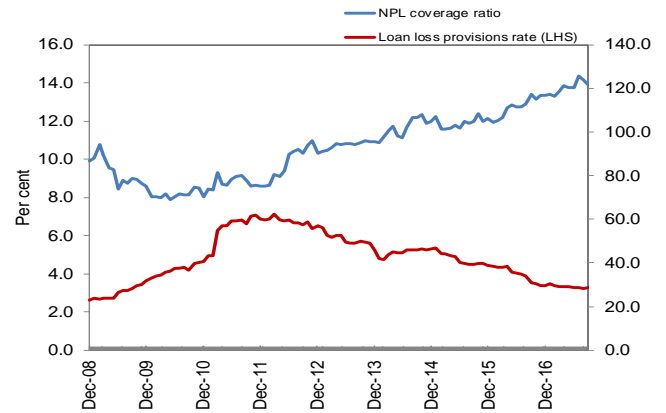


Figure 3.12 Distribution of NPL coverage ratio in the domestic DTI sector (min, max and median)

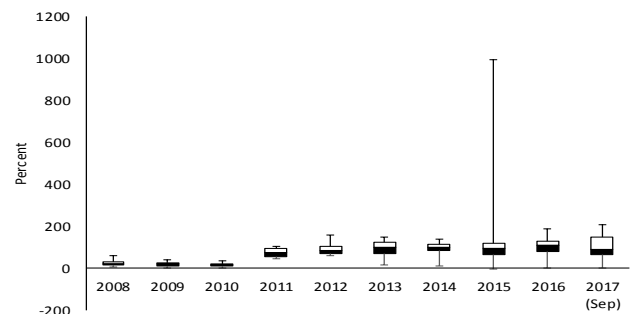
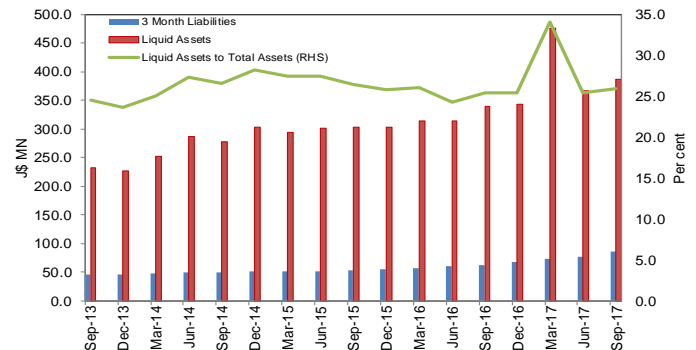


Figure 3.13 Liquidity conditions in the DTI sector



¹³ Real growth in funding from deposits was 7.7 per cent as at 2017.

Figure 3.14 Distribution of DTIs’ funding sources as a share of total liabilities as at end-September 2017 and end-2016

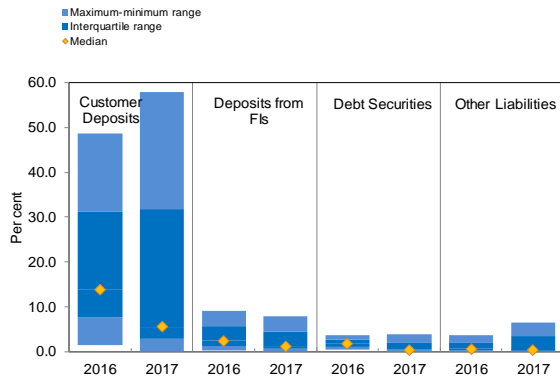


Figure 3.15 Trends in loans and deposits of the DTI sector

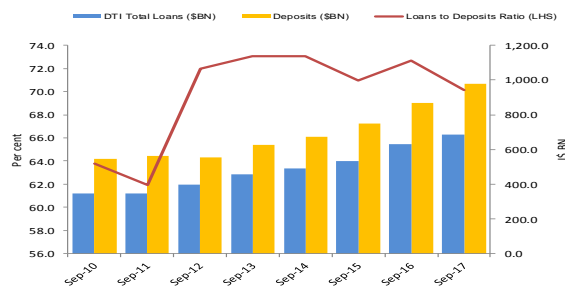
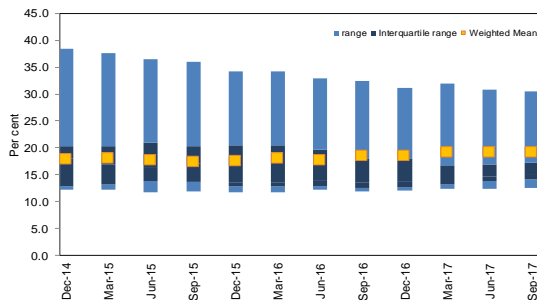


Figure 3.16 Distribution and average of capital adequacy ratio



increased to \$37.3 billion for the year ended September 2017 relative to \$30.6 billion dollars for the previous year ending September 2016 (see **Figure 3.17**).¹⁴ However, the sector’s return on equity (ROE) decreased by 0.9 percentage point to 16.1 per cent at end-September 2017. An examination of the ROE showed decreases in the operating margin, gross income and the risk weighted assets density ratio (see **Figure 3.18**).¹⁵ In addition, DTIs’ leverage ratio as measured by Tier 1 capital as a percentage of total assets decreased during 2017. Notably, the median leverage ratio decreased to 10.1 per cent relative to 10.3 per cent at end-2016 (see **Figure 3.19**).

In addition, DTIs’ return on assets (ROA) increased to 2.6 per cent for the year ending September 2017 relative to 2.0 per cent for the year ending September 2016. Moreover, the median ROA decreased to 2.3 per cent at end-September 2017 relative to 2.6 per cent (see **Figure 3.20**). This reflected an increase in net interest income of 8.1 per cent during the year ending September 2017, which was largely due to increases in *Loans Advances & Discounts*. Concurrently, interest expenses increased by 18.4 per cent, primarily as a result of an increase in borrowing expenses (see **Figures 3.21 to 3.23**). Moreover, net interest margin for DTIs was 7.2 per cent at end-September 2017 relative to 7.1 per cent at end-September 2016 (see **Figures 3.22**).¹⁶

¹⁴ Operating profits excludes non-interest income and expenses

¹⁵ Operating margin is equal to net profit as a percentage of gross income. The risk weighted assets (RWA) density ratio is calculated as RWA as a percentage of total assets. Equity multiplier is equal to total assets as a proportion of capital and reserves.

¹⁶ Net interest margin is equal to net interest income/average earning assets.

3.4 Non-Deposit-Taking Financial Institutions (NDTFIs)

The asset base of the NDTFI sector increased by 9.9 per cent to \$1 739.8 billion as at end-September 2017 compared to \$1 582.6 billion at end-2016.¹⁷ The expansion in the sector’s total assets was influenced by increases in assets of all NDTFI sub-sectors. Within the NDTFI sector, the asset base of securities dealers improved by 8.5 per cent for the first three quarters of 2017 relative to the close of 2016. The asset base of life and general insurance companies grew by 3.8 per cent and 9.3 per cent, respectively, for the same period. Furthermore, collective investment schemes (CIS) reflected the most significant growth for the review period. The asset base of CIS increased by 15.3 per cent for the review period relative to end-2016, reflecting increases in unit trusts and mutual funds. In addition, pension funds’ assets grew by 13.3 per cent to \$513.3 billion, reflecting the sharpest acceleration for the review period (see **Figure 3.25**).

At end-September 2017, assets of securities dealers, pension funds and life insurance companies accounted for 34.3 per cent, 29.5 per cent, and 17.7 per cent, respectively, of NDTFIs’ total assets. However, all NDTFI sub-sectors recorded a lower share of the market relative to end-2016, with the exception of CIS and pension funds. The securities dealers’ sector demonstrated lower asset growth relative to the previous review period due to the continued phasing down of the retail repurchase business model and asset substitution to unit trusts and mutual funds.

3.4.1 Securities Dealers

The asset base of securities dealers was \$599.5 billion at end-September 2017, relative to \$578.8 billion at

Figure 3.17 Operating profit and impairment losses for DTIs

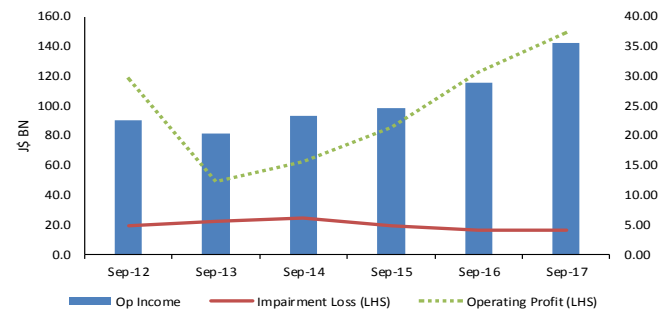


Figure 3.18 Decomposition of DTIs’ ROE

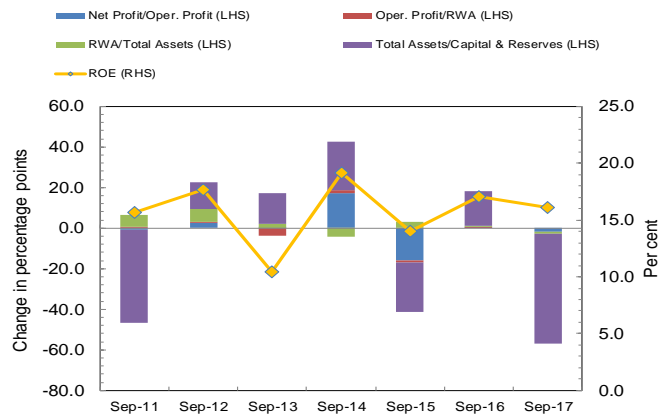
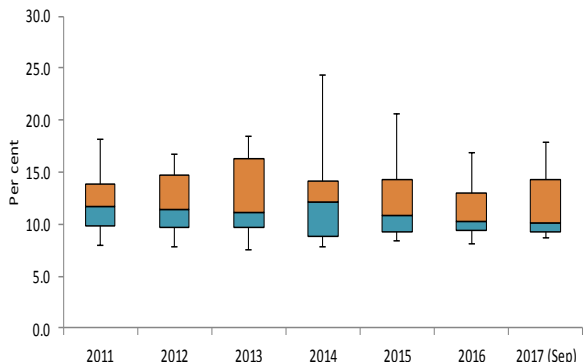


Figure 3.19 Distribution of DTIs’ leverage



¹⁷ Real growth of NDTFI’s asset base was 6.2 per cent as at September 2017

Figure 3.20 Distribution of DTIs’ return on assets (ROA)

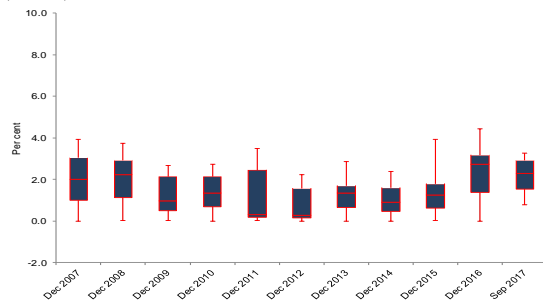


Figure 3.21 DTIs’ sources of revenue, charges for provisions and net profit (JMD billions)

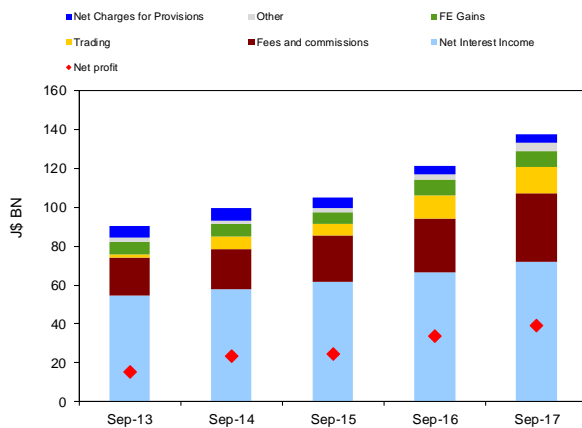
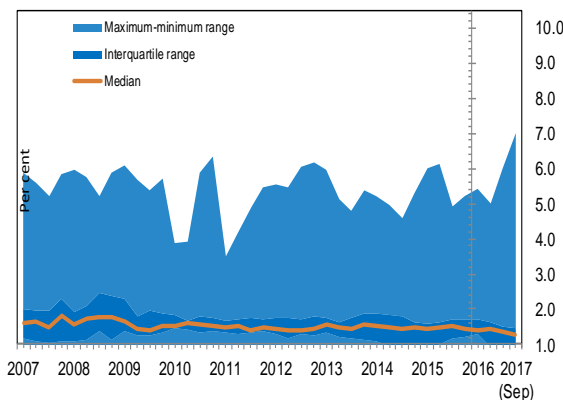


Figure 3.22 Interest margin for retail operations of DTIs



end-September 2016.¹⁸ The on and off-balance sheet funds under management (FUM) assets of the SDs increased to \$1 089.3 billion at end-September 2017 relative to \$1 034.9 billion at end-September 2016. The increase in FUM for the review period was driven by an increase in CIS, including pooled funds (see **Figure 3.26**). Additionally, other dealers which include insurance companies that manage private pension funds, held FUM assets on behalf of investors which amounted to an additional \$467.3 billion as at end-September 2017.

RWA of the securities dealers rose by 8.3 per cent to \$380.8 billion at end-September 2017, relative to end-2016 (see **Figure 3.24**).¹⁹ This increase, coupled with a slower pace of increase in regulatory capital influenced a decrease in the sector’s capital adequacy ratio (CAR) by 1.5 percentage point to 18.9 per cent at end-September 2017 (see **Figure 3.27**). Similarly, the sector’s primary ratio, measured as regulatory capital to total assets, decreased by 0.1 percentage point to 12.9 per cent at end-September 2017. However, both the CAR and primary ratio remained above the prudential benchmark of 10.0 per cent and 6.0 per cent, respectively. Regulatory capital increased by 4.2 per cent to \$72.0 billion.

SDs were more susceptible to foreign exchange risk at end-September 2017 compared to end-2016. The sector’s foreign currency net open position to capital ratio increased to 20.9 per cent at end-September 2017, relative to 18.7 per cent at the close of 2016 (see **Figure 3.28** and **Table 3.4A**). This increased foreign exchange exposure is consistent with the trend increase in dollarization in the sector since end-2016, however, the pace of growth has slowed. As at end-September 2017,

¹⁸ This represents the total assets of the thirty-two dealers that are considered core securities dealers.

¹⁹ For the remainder of the chapter, the analysis is based on a representative sample of twelve SDs that comprise 70.0 per cent of the sector.

foreign currency investment holdings to total investments was 57.8 per cent, compared to 59.6 per cent at end-2016.

The SDs sector showed marginal deterioration in profitability. For the year ended September 2017, SDs reflected a ROA of 1.7 per cent and ROE of 12.3 per cent compared to a ROA and ROE of 1.9 per cent and 13.6 per cent, respectively, for the year ended September 2016 (see **Figure 3.29** and **Table 3.3**). Furthermore, total liabilities as a share of total assets, which is one measure of leverage, remained constant at 86.0 per cent as at end-September 2017.

3.4.2 Insurance Companies

The number of companies in the insurance sector at end-September 2017 remained constant at sixteen when compared to end-2016. Life insurance companies continued to be the dominant sub-sector, accounting for 80.4 per cent of the sector’s total assets. Furthermore, the two largest life insurance companies accounted for 65.5 per cent of the sub-sector’s total assets as at end-September 2017. The three largest companies of the general insurance sub-sector accounted for approximately 52.0 per cent of the sub-sector’s asset base.

Similar to DTIs and SDs, there was growth in the insurance sector’s asset base as at end-September 2017 relative to the close of 2016. More specifically, the sector grew by 4.9 per cent (see **Figure 3.30**). The respective asset bases for life and general insurance companies were \$308.6 billion and \$75.4 billion at end-September 2017 compared to \$297.1 billion and \$69.0 billion at end-2016. For life insurance companies, asset growth was driven predominantly by an increase in short term investments in GOJ securities of approximately 30.0 per cent. However, the increase in the asset base of general insurance companies was influenced by growth in cash of 62.3 per cent.

Figure 3.23 DTIs’ sources of interest income



Figure 3.24 Risk-weighted assets (Two largest banks vs banking sector; securities dealers (SDs))

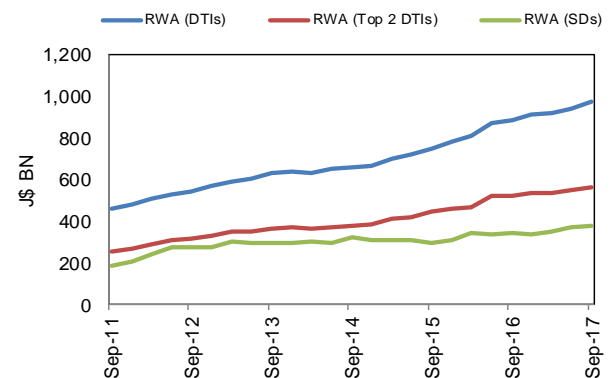


Figure 3.25 Change in market share in NDTFIs assets (change between end-2016 and end-September 2017)

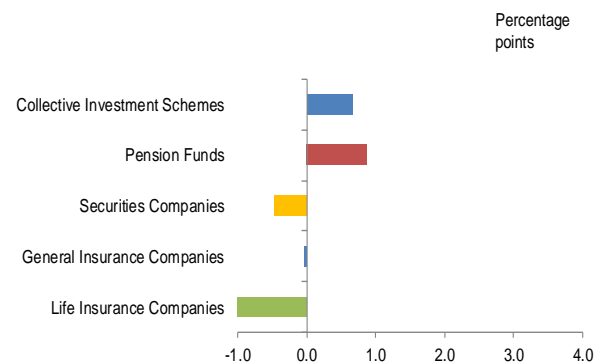


Figure 3.26 Major components of SDs’ FUM assets as end-September 2016 and end-September 2017

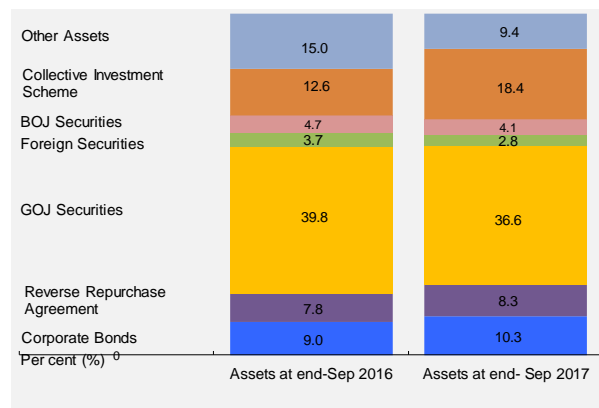


Figure 3.27 Securities dealers’ regulatory capital, capital adequacy and primary ratios

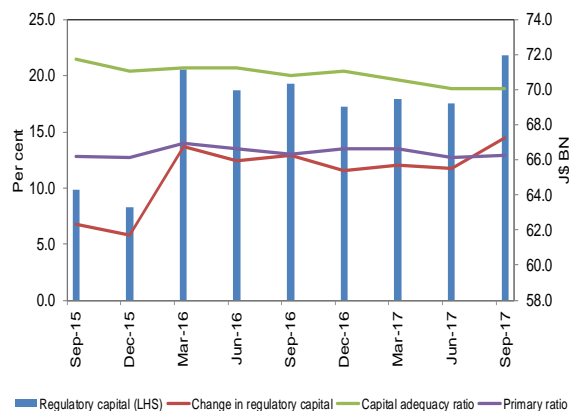
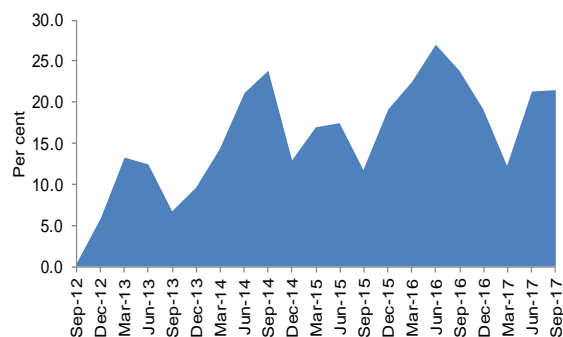


Figure 3.28 Securities dealers’ net open position to capital



Government securities accounted for 58.0 per cent and 30.0 per cent of life and general insurance assets, respectively, at end-September 2017, relative to 58.6 per cent and 34.7 per cent at end-2016 (see **Figures 3.31** and **3.32**). As at end-September 2017, the share of real estate, unquoted equities and debtors in total assets for the life insurance and general insurance sub-sectors accounted for 4.1 and 26.0 per cent, respectively, relative to 3.7 per cent and 23.6 per cent at the close of the previous year. Thus, the asset quality of the life insurance sub-sector demonstrated a negligible movement. On the other hand, the asset quality of the general insurance sub-sector deteriorated by 2.4 percentage points.²⁰

The market for insurance continues to be relatively underdeveloped. Despite growth in the sector’s asset base, insurance penetration showed marginal improvement but continued to be low as at end-September 2017 (see **Figure 3.33** and **Table 3.5**).²¹ Insurance penetration for life insurance companies increased to 3.2 per cent of GDP at end-September 2017, relative to 2.8 per cent of GDP as at end-2016. Furthermore, insurance penetration for general insurance companies remained at 2.3 per cent. Against this background, the insurance density remained flat at 0.001 per cent since 2008.²²

The total gross written premium (GWP) of insurance companies was \$99.2 billion for the twelve-month period ended September 2017 relative to \$88.8 billion for the previous review period. Notably, the increase in

²⁰ Real estate, unquoted equities and debtors are asset classes within the insurance sector which have the largest probability of being impaired. This is largely due to the fact that real estate and unquoted equities are illiquid assets, while debtors exposes the sector to credit risk. The calculation of debtors for general insurance includes reinsurance recoverable which account for more than 50.0 per cent of debtors, these recoverables are from companies with a A-credit rating

²¹ Insurance penetration is defined as ratio of premium to GDP. It measures the importance of insurance activity relative to the size of the economy.

²² Insurance density is the ratio of total gross premiums to total population.

GWP in the insurance sector was evidenced in both sub-sectors (see **Figure 3.34**). In addition to the increase in GWP, there was a 5.3 per cent increase in claims incurred by the sector for the twelve-month period ended September 2017 relative to the prior review period ended September 2016 (see **Figure 3.35**). Furthermore, the claims ratio, which is the ratio of claims incurred to earned premiums for insurance sector, was 27.6 per cent for the twelve-month period ended September 2017 compared to 29.3 per cent for end-September 2016.^{23,24} The five year average of the insurance claims ratio was 28.5 per cent. This decrease in the claims ratio was driven by the faster growth of earned premiums relative to claims incurred.

The insurance sector’s profitability demonstrated mixed results for the two sub-sectors. The sector in general reflected a slight decline for the review period despite the 24.1 per cent growth in total income for the year ended September 2017 relative to the prior review period (see **Figure 3.36**). Profit before tax and extraordinary expense for the insurance sector was \$26.6 billion for the year ended September 2017 relative to \$27.5 billion for the year ended September 2016. A decrease in general insurance profits before taxes of 41.6 per cent to \$3.0 billion for year end-September 2017 largely influenced the profit performance for the insurance sector (see **Figure 3.37**).

The ROA of the life insurance sector increased by 0.5 percentage point to 7.7 per cent, while the ROE increased by 1.3 percentage point to 31.9 per cent at year end-September 2017, relative to end-2016. Contrastingly, the ROA for the general insurance sector decreased to 4.2 per cent while the ROE decreased to 11.6 per cent for the year ended September 2017, relative to 6.6 per cent and 17.8 per cent, for end-2016.

Figure 3.29 Securities dealers’ return on assets and return on equity

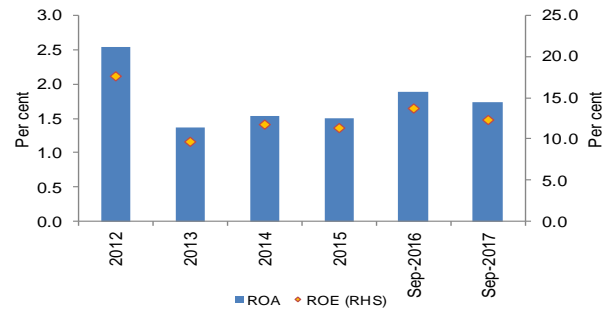


Figure 3.30 Total assets of insurance companies²⁵

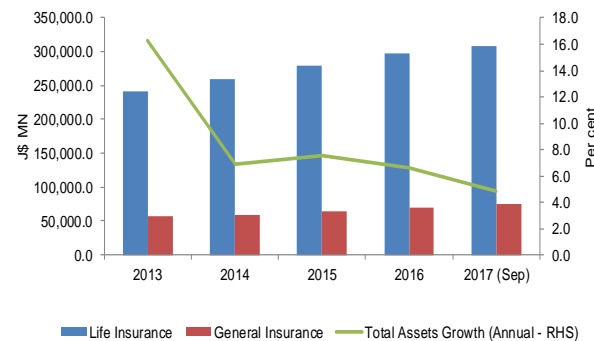
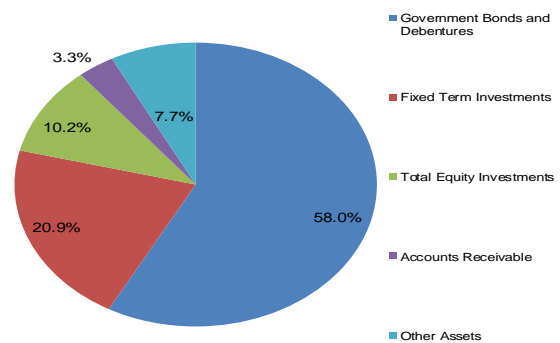


Figure 3.31 Distribution of assets of life insurance companies



²³ 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.

²⁴ The breakdown of data required for the calculation of this ratio is not available for life insurance companies.

²⁵ Due to changes in IFRS reporting requirements in 2013, life insurance companies had to start reporting on balance sheet, some items that were previously recorded as off balance sheet. This would account for the significant growth in life insurance companies’ total assets for that period.

Figure 3.32 Distribution of assets of general insurance companies

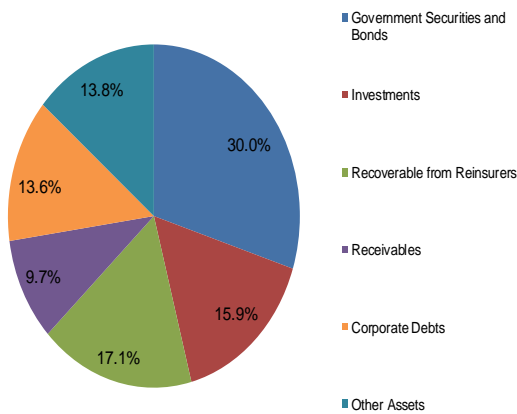


Figure 3.33 Insurance penetration (% of GDP)

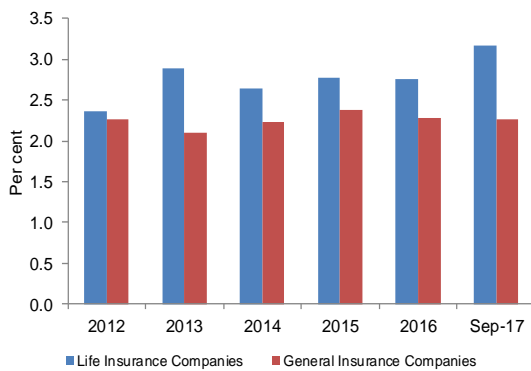
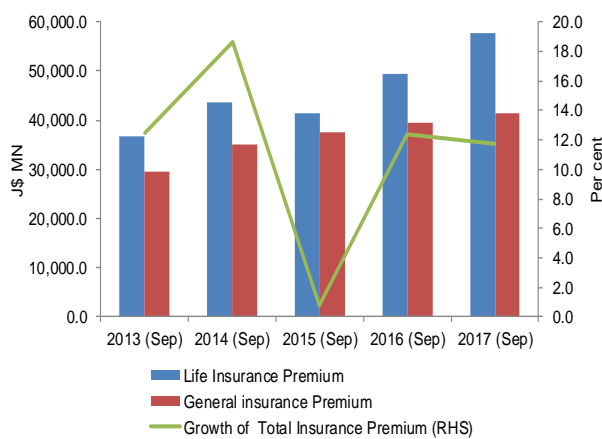


Figure 3.34 Premium income and growth of insurance sector



The reduction in the general insurance sector’s profitability resulted from a decrease in gains from fluctuations in foreign exchange rate, largely reflecting the slower pace of depreciation of the local dollar for the review period. However, the combined operating ratio for general insurance increased by 5.1 percentage points to 59.4 per cent at end-September 2017 compared to the prior review period.²⁶

The capital adequacy and solvency of the insurance companies remained at sufficient levels at end-September 2017. In particular, the sector’s median solvency ratio, as measured by available capital to total liabilities, marginally decreased to 154.0 per cent relative to 156.5 per cent at the close of 2016 (see **Figure 3.38**). Additionally, there was a decrease in the ratio of capital to total assets to 21.8 per cent at end-September 2017 from 22.6 per cent at end-2016 (see **Figure 3.39**).

All life insurance companies surpassed the Minimum Continuing Capital and Surplus Requirements (MCCSR) ratio prudential benchmark.²⁷ The MCCSR ratio for the life insurance sub-sector was 235.5 per cent in comparison to the minimum requirement of 150.0 per cent. Similarly, all general insurance companies exceeded the Minimum Capital Test (MCT) prudential benchmark of 250.0 per cent.²⁸ The MCT ratio for the general insurance sub-sector was 322.5 per cent.

At end-September 2017, the reinsurance retention ratio for life insurance companies was 98.4 per cent and

²⁶ The combined operating ratio is a financial measure of insurance core profitability and is expressed as the total of claims costs, commissions and management expenses as a percentage of premiums.

²⁷ The Minimum Continuing Capital and Surplus Requirements (MCCSR) uses the actuarial liabilities and asset mix to measure an insurer’s capital adequacy to meet its obligations to policyholders. Except for annual filing of the MCCSR, the figures are preliminary

²⁸ 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 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.

remained flat relative to end-2016. However, general insurance companies' reinsurance retention ratio decreased to 40.2 per cent at end-September 2017 from 43.7 per cent at the end of 2016 (see **Figures 3.40 & 3.41**).²⁹

Figure 3.35 Earned premium, claims incurred and claims ratio of insurance sector

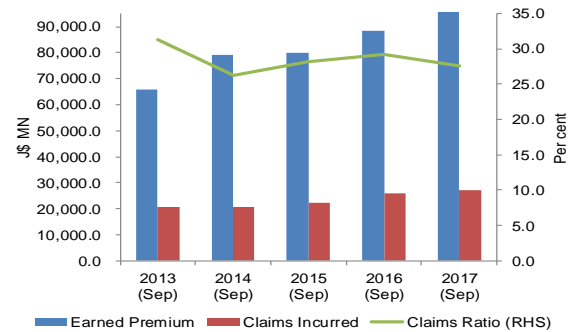


Figure 3.36 Total income (GWP + investment income) of the insurance sector

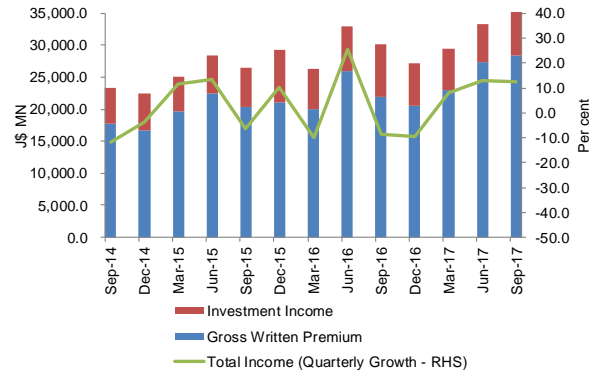
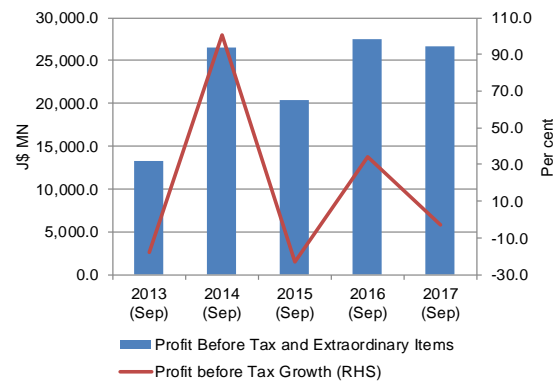


Figure 3.37 Profit before tax and growth of insurance companies



²⁹ 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.

Figure 3.38 Distribution of the solvency of insurance companies (available to required solvency ratio; %)

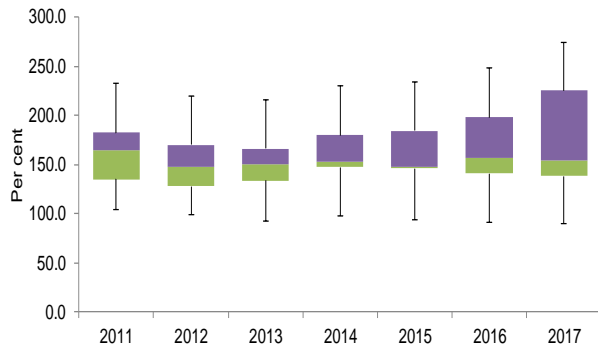


Figure 3.41 General insurance retention ratio; %

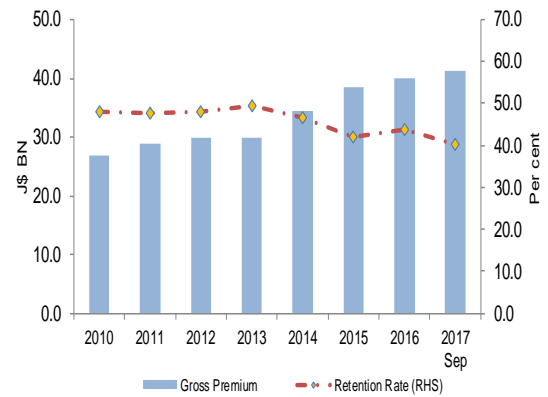


Figure 3.39 Capitalization of the insurance sector (JMD billions; %)

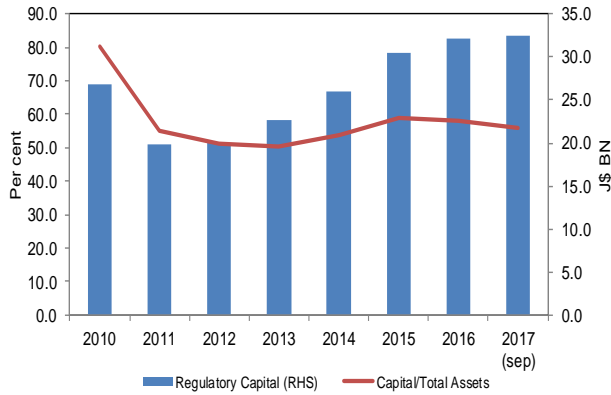


Figure 3.40 Life insurance retention ratio; %

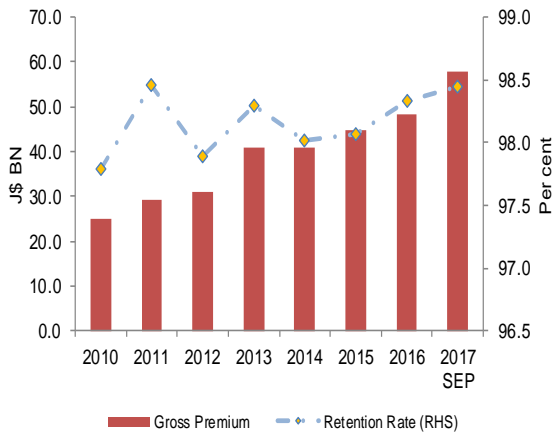


Table 3.2 Financial Soundness Indicators for Deposit-Taking Institutions^{1/}

Indicator (%)	Categories	Mar-16	Jun-16	Sep-16	Dec-16	Mar-17	Jun-17	Sep-17
Core Indicators								
Regulatory capital to risk-weighted assets	Capital adequacy	14.8	14.5	14.7	14.7	14.8	14.9	14.8
Tier 1 capital to risk-weighted assets	Capital adequacy	14.9	14.5	14.6	14.7	14.3	14.4	14.8
Non-performing loans (net) to capital	Capital adequacy	-1.2	-1.9	-2.4	-2.2	-2.4	-2.5	-2.6
Non-performing loans to total loans	Assets quality	4.0	3.5	3.0	2.9	2.8	2.7	2.6
Return on assets	Earnings & Profitability	0.7	0.9	0.7	0.7	0.7	0.7	0.7
Return on equity	Earnings & Profitability	4.3	6.0	4.9	4.6	4.5	4.4	4.4
Interest margin to income	Earnings & Profitability	50.7	45.5	48.9	48.7	46.2	43.2	41.6
Non-interest expenses to income	Earnings & Profitability	24.3	21.9	22.8	23.0	23.8	24.3	22.7
Liquid assets to total assets	Liquidity	26.0	24.3	25.5	25.3	34.0	25.4	25.9
Duration on assets - Domestic Bonds	Sensitivity to Market Risk	1.1	1.0	1.2	N/A	N/A	N/A	N/A
Duration on assets - Global Bonds	Sensitivity to Market Risk	3.5	3.3	3.0	N/A	N/A	N/A	N/A
NOP to capital	Sensitivity to Market Risk	13.6	13.9	7.0	3.5	6.7	1.8	8.5
Encouraged Indicators								
Capital to assets	Capital adequacy	15.2	14.8	14.9	14.6	15.9	15.9	16.2
Trading income to total income	Earnings & Profitability	13.2	19.4	15.6	16.5	13.8	14.9	13.0
Personnel expenses to non-interest expenses	Earnings & Profitability	39.3	38.3	37.5	34.6	37.9	32.2	30.8
Spread between lending & deposits rates ^{2/}	Earnings & Profitability	13.3	13.2	13.0	13.0	12.7	11.9	12.4
Deposits to total (non-interbank) loans	Liquidity	145.1	138.7	138.1	137.0	121.3	129.7	130.2
Foreign-currency-denominated loans to total loans	Foreign Exchange risk	23.1	27.4	27.2	26.4	26.0	25.6	25.3
Foreign-currency-denominated liabilities to total liabilities	Foreign Exchange risk	42.1	42.7	43.1	42.8	41.9	42.0	40.5
Household debt to GDP	Household sector leverage	17.0	17.3	17.7	18.3	17.2	16.6	20.8
Residential real estate loans to total loans	Exposure to real estate	24.5	23.0	22.5	22.8	18.9	17.1	28.7
Commercial real estate loans to total loans ^{3/}	Exposure to real estate	0.2	0.2	0.2	0.1	0.0	0.1	0.1

Notes:

^{1/} Deposit-taking Institutions (DTIs) include commercial banks, merchant bank and building societies.

^{2/} Weighted by assets size.

^{3/} Represents data for building societies only.

Table 3.3 Financial Soundness Indicators for Securities Dealers and Insurance Companies

Indicator (%)	Categories	Mar-16	Jun-16	Sep-16	Dec-16	Mar-17	Jun-17	Sep-17
A. Securities Dealers ^{1/}								
Regulatory capital to risk-weighted assets	Capital adequacy	20.7	20.7	20.0	20.4	19.6	18.9	19.1
Tier 1 capital to risk-weighted assets	Capital adequacy	18.3	17.5	17.1	17.5	17.1	16.7	16.0
Non-performing loans (net) to capital	Capital adequacy	0.1	0.1	0.1	-0.1	0.0	0.0	0.0
Non-performing loans to total loans	Assets quality	6.6	5.4	4.5	3.2	3.6	3.4	3.4
Return on assets	Earnings & Profitability	0.3	0.8	0.6	0.3	0.4	0.5	0.7
Return on equity	Earnings & Profitability	2.6	6.3	4.5	2.3	3.0	4.0	5.0
Interest margin to income	Earnings & Profitability	30.2	23.6	25.8	27.0	26.9	27.3	21.4
Non-interest expenses to income	Earnings & Profitability	33.5	26.2	32.1	39.3	36.3	30.8	31.3
Liquid assets to total assets	Liquidity	9.3	10.8	12.3	11.5	11.2	12.9	13.6
Duration on assets -Domestic Bonds	Sensitivity to Market Risk	2.2	3.0	2.6	2.6	2.6	2.8	2.2
Duration on assets- Global Bonds	Sensitivity to Market Risk	6.3	8.3	8.1	9.0	8.9	8.4	7.7
NOP to capital	Sensitivity to Market Risk	22.5	27.1	23.8	18.7	11.9	20.8	20.9
B. General Insurance								
Net premium to Capital	Capital adequacy	21.1	21.0	28.1	13.2	22.3	21.7	21.0
Capital to Assets	Capital adequacy	30.2	27.8	29.7	30.5	30.2	28.4	28.9
(Real estate + unquoted equities + debtors) to total assets ^{2/}	Assets quality	22.8	29.4	25.3	23.6	22.7	26.7	26.0
Receivables to gross premiums	Assets quality	156.1	146.9	200.5	187.9	147.2	134.7	193.4
Equities to total assets	Assets quality	2.4	2.3	2.5	3.1	3.3	3.3	3.5
Net technical reserves to net claims paid in last 3 years	Reinsurance & actuarial issues	457.6	378.8	346.0	432.5	464.4	464.0	427.4
Risk retention ratio (net premium to gross premium)	Reinsurance & actuarial issues	47.1	30.9	70.1	34.7	47.6	33.2	48.3
Gross premium to number of employees J\$(000)	Management Soundness	7.7	12.2	7.3	6.8	8.4	11.8	8.0
Assets per employee J\$(000)	Management Soundness	56.8	64.4	61.4	58.5	59.6	63.7	64.0
Net Claims to net premium (loss ratio)	Earnings & Profitability	63.1	64.5	56.2	46.5	63.4	66.5	59.6
Total expenses to net premium (expense ratio)	Earnings & Profitability	100.7	99.1	97.5	79.7	99.7	103.3	99.5
Combined ratio (loss + expense ratio)	Earnings & Profitability	163.8	163.6	153.7	126.2	163.1	169.8	159.0
Investment Income to net premium	Earnings & Profitability	16.5	21.0	22.8	15.8	19.4	19.1	23.2
Return on Equity	Earnings & Profitability	3.4	5.4	9.7	2.5	2.7	3.0	5.9
Liquid assets to total liabilities	Liquidity	86.3	77.9	83.4	87.4	86.4	77.4	85.2
C. Life Insurance								
Capital to technical reserves	Capital adequacy	77.6	84.5	84.6	81.8	88.1	87.5	82.6
(Real estate + unquoted equities + debtors) to total assets	Assets quality	3.3	3.5	3.3	3.7	3.9	3.8	4.1
Receivables to gross premiums	Assets quality	68.7	73.4	59.1	72.8	70.8	66.4	53.8
Equities to total assets	Assets quality	2.7	2.7	2.6	3.1	2.5	2.9	3.2
Net technical reserves to net premium paid in last 3 years	Reinsurance & actuarial issues	756.7	752.0	770.8	767.3	753.2	740.7	798.6
Risk retention ratio (net premium to gross premium)	Reinsurance & actuarial issues	98.2	97.8	98.4	98.8	94.7	98.3	69.6
Gross premium to number of employees J\$(000)	Management Soundness	5.7	6.0	6.9	6.5	6.7	7.0	9.8
Assets per employee J\$(000)	Management Soundness	142.3	148.8	152.7	154.0	151.1	152.7	159.9
Expenses to net premium (expense ratio)	Earnings & Profitability	51.9	52.5	41.2	49.2	54.7	42.9	50.2
Investment Income to investment assets	Earnings & Profitability	2.3	2.4	2.6	2.4	2.1	1.9	2.9
Return on Equity	Earnings & Profitability	6.1	6.6	8.3	9.6	8.1	8.6	6.0
Liquid assets to total liabilities	Liquidity	27.7	29.1	33.0	28.4	29.3	23.2	32.6
Duration on assets -Domestic Bonds	Sensitivity to market risk	1.3	1.3	1.7	1.2	1.2	1.2	N/A
Duration on assets- Global Bonds	Sensitivity to market risk	8.8	5.5	6.7	6.9	8.9	8.4	N/A

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 3.4 Sectoral Indicators of Financial Development

Sub-sector	Indicator	2012	2013	2014	2015	2016	2017
Banking	Total number of DTIs	13	12	11	11	11	11
	Number of branches and outlets	173	166	165	165	165	165
	Number of branches/thousands population	0.06	0.06	0.06	0.06	0.06	0.06
	Bank deposits/GDP (%)	44.5	45.1	44.3	47.1	50.4	53.8
	Bank assets/total financial assets (%) ^{1/}	36.6	37.2	35.7	36.8	37.1	38.3
	Bank assets/GDP (%)	66.2	67.8	69.3	71.8	77.9	81.9
Insurance	Number of insurance companies	14	14	15	16	17	16
	Gross premiums/GDP (%)	4.6	5.0	4.9	4.8	5.0	5.4
	Gross life premiums/GDP (%)	2.4	2.9	2.6	2.5	2.8	3.2
	Gross non-life premiums/GDP (%)	2.3	2.1	2.2	2.3	2.3	2.3
	Insurance assets/GDP (%)	19.6	21.0	20.7	21.2	21.1	21.1
	Insurance assets/total financial assets (%)	10.3	10.8	11.0	10.7	10.5	10.1
Pensions	Types of pension plans						
	# Defined Benefit plan	116	111	110	107	106	99
	# Defined Contribution plan	347	333	319	308	304	300
	Pension fund assets/total financial assets (%)	12.4	11.9	11.4	11.5	12.0	13.2
	Pension fund assets/GDP (%)	22.4	21.6	22.1	22.4	25.2	28.2
Mortgage	Mortgage assets/total financial assets (%) ^{2/}	11.8	8.3	7.9	8.4	8.4	7.1
	Mortgage assets/GDP (%)	21.3	15.1	15.4	16.4	17.6	15.3
Securities Dealers	Total number of securities dealers	29	29	30	29	32	32
	Securities dealer's/total financial assets (%)	21.5	20.2	18.2	16.6	15.8	15.4
	Securities dealer's assets/GDP (%)	39.0	36.8	35.3	32.5	33.3	32.9
Credit Union	Total number of credit unions	43	38	37	37	37	N/A
	Credit union's assets/total financial assets (%)	3.0	3.0	2.7	2.7	2.4	N/A
	Credit union's assets/GDP (%)	5.4	5.4	5.3	5.3	5.1	N/A
Foreign exchange markets	Adequacy of foreign exchange (reserves in months of imports)	3.3	3.3	5.0	5.7	5.7	6.5
	Foreign exchange reserves as ratio to short-term external debt (%)	281.0	139.3	279.8	527.2	283.8	621.1
Capital markets	Number of listed securities (equities) ^{3/}	50	56	54	64	68	67
	Number of new issues (equities) ^{4/}	4	14	7	1	7	8
	Number of new issues (bonds) ^{5/}	24	2	0	0	6	8
	Value of new issues (equities) J\$Bn	0.4	45.0	1.4	0.3	1.8	10.8
	Value of new issues (bonds) J\$Bn	77.8	1.7	0	0.0	41.8	55.8
	Market capitalization/GDP (%)	44.7	34.6	19.0	36.9	39.7	39.7
	Value traded/market capitalization (%)	3.1	2.4	5.4	2.8	3.5	3.5
Collective investment scheme	Local unit trust and mutual funds (J\$BN) ^{6/}	49.7	58.0	111.0	136.4	181.2	211.5
	Number of local unit trust and mutual funds	9	10	11	12	13	14
	Local unit trust and mutual funds/total financial assets (%)	2.1	2.2	3.7	4.3	5.0	5.4
	Overseas mutual funds (value of units held by Jamaicans)US\$MN	122.0	165.0	177.0	200.9	223.0	258.6
	Overseas mutual funds/total financial assets(%)	0.5	0.7	0.7	0.7	0.8	0.9

Notes:

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

^{2/} Includes data for building societies, commercial banks & National Housing Trust

^{3/} Includes Junior market listings

^{4/} Includes preference shares

^{5/} Government of Jamaica bonds

^{6/} Unit trust portfolios are composed mainly of fixed income securities, equities and real estate investments

Box 3.1 Correspondent Banking Activity in 2016

Since the 2016 Financial Stability Report, there has not been any major negative developments. Domestic banks have not reported any further losses in correspondent banking relationships (CBRs). However certain types of businesses still find it difficult to obtain correspondent banking services.

The withdrawal of correspondent banking services set in motion a number of global and domestic measures to counter its impact. Some of Jamaica’s actions included the continued implementation of necessary FATF recommendations against money laundering and an enhancement of communication between various stakeholders. There continues to be dialogue with correspondent banks and with international financial institutions to better understand the specific factors driving de-risking in the Caribbean and to discuss practical actions that can help reverse the withdrawal of relationships. The discussions are creating opportunities for remediation and training, and at least one international correspondent bank has increased its presence in the region.

The Structure of Correspondent Banking Activity in Jamaica¹

The collection and analysis of correspondent banking data has been identified as a much-needed exercise to help efforts mitigate the withdrawal of CBRs. The volume and value of cross-border payment flows conducted by domestic banks can be used as a measure correspondent banking activity since the ability to provide customers with cross-border payments is facilitated through nostro accounts provided by correspondent banks.

SWIFT MT103 & MT202 transactions are used to describe the structure of correspondent banking activity in Jamaica.² Two DTIs accounted for 52 per cent of the number of correspondent bank relationships and 62 per cent of the volume of transaction sent in 2016. Another two DTIs accounted for 22 per cent of volume and the remaining six DTIs on aggregate accounted for 16 per cent of outgoing cross border volume (see Table 1).

¹ Analysis is based on data gathered for the Financial Stability Board’s 2016 Survey on Correspondent Banking. Ten DTIs reported on the number of correspondent banks with which they have relationships. The data set also includes the value and volume of MT103 and MT202 message types as at June 2016. The analysis

Table 1 Correspondent Bank Activity (cumulative % of total)

	2 DTIs	4 DTIs	10 DTIs
# of international correspondent banks	52.0%	78.0%	100.0%
Volume of transactions sent	61.8%	84.0%	100.0%
Value of transactions sent	47.8%	81.6%	100.0%

Domestic banks in Jamaica were net senders of correspondent banking flows in terms of the volume of transactions. The number of transactions sent exceeded the number of transactions received by 25.5 per cent. On the other hand, Jamaica banks are net receivers in the value of cross border payment flows. The value of transactions received exceeded the value sent by 66.4 per cent. In addition, the value of transactions received is dominated by two foreign owned domestic banks, accounting for 81 per cent of transactions received (see Figure 1 &2).

Figure 1. Share of Volume of Transactions Received

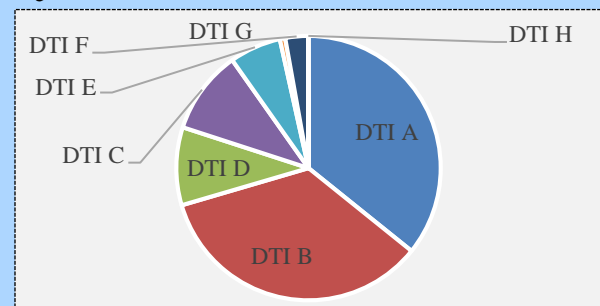
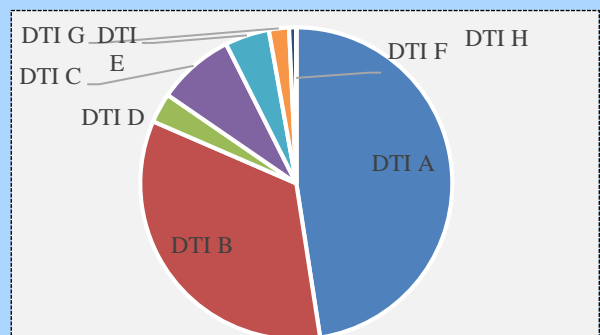


Figure 2. Share of Value of Transactions Received



provided is based on USD activity that accounts for more than 85% of reported transactions in Jamaica.

²MT 103 message type, known as a `single customer credit transfer`, is used for all customer-to-customer payments across SWIFT. MT 202 is used for the movement of funds on behalf of financial institutions.

In terms of the loss of correspondent banking relationships, of the number of DTIs reporting a decline in the number of CBRs just one reported a decline in the volume of transactions flows as at 2016 (Table 2). This partly reflects the efforts made by the sector to counter the withdrawal of CBRs. However, in many cases, international correspondent banks no longer facilitate the full range of transactions that were previously offered or they are offered with more restrictive terms and conditions.

Table 2 Change in Correspondent Bank Activity 2012-2016

	Change in # of CBRs	Average yearly change in volume of transactions sent	Average yearly change in value of transactions sent
DTI C	50.0%	24.7%	17.3%
DTI D	33.3%	4.8%	0.8%
DTI G	50.0%	-2.5%	11.7%
DTIs reporting no decline			
DTI B	0.0%	34.7%	30.4%
DTI F	0.0%	0.4%	16.7%
DTI H	0.0%	-7.8%	-15.7%

Only six DTIs reported SWIFT transactions data in multiple years. Changes for DTI 3 and DTI 4 are based on values reported in 2014.

Potential Solutions

The availability and scope of correspondent banking services continues to serve as an uncertainty in the domestic and regional financial landscape. Local financial sectors are now more dependent on fewer international correspondent banks operating upon a still fluid regulatory landscape. Engagement with international stakeholders has led to the identification of some priority efforts for minimizing the risk of further losses of CBRs. Some of which include:

1. Training: Some international correspondent banks have provided targeted training, which continues to be an important element to reduce potential loss in services. Domestic respondent banks should continue to improve upon the quality and timeliness in requests for information information and a move to a more automated process in the monitoring of correspondent banking transactions.

2. Regional Harmonization in AML/CFT Compliance: The region's relatively weak AML/CFT frameworks provided the pretext for the withdrawal of CBRs in the Caribbean. Caribbean jurisdictions should have frameworks consistent with the Financial Action Task Force standards, and consistent with each other to facilitate international correspondent banks' operations.

Weaknesses identified in the Caribbean Financial Action Task Force Mutual Evaluation Reports and National AML/CFT Risk Assessments should be addressed. Jamaica is making progress in this regard and continues to provide updates to the CFATF on the status of priority actions taken or being taken to address identified weaknesses.

The ECCU has started regionalization efforts in the AML/CFT supervisory context, and consideration could be given to replicate this more broadly in the region The aim of which is to develop a deliberate and targeted framework that focuses on a culture of compliance with international AML/CFT standards, and by extension, cultivate a reputation for compliance.

3. Consolidating transactional traffic through downstreaming: Harmonization of the regulatory frameworks can be complemented by the consolidation of correspondent banking activity through fewer regional intermediary providers of correspondent services. Once transparent and once risks are well managed, downstreaming may provide more certainty in the scale and scope in services available.

Consolidation of correspondent banking activity will however increases risks associated with concentration. In addition, strategies of consolidation need to balance issues of geographical reach, financial inclusion, and competition. Small institutions might today provide low value added, but represent potential future competition that will help deepen and improve resilience of regional financial systems.

4. Financial System Sectoral Exposures

4.1 Overview

Despite mixed results during 2017, deposit-taking institutions' (DTIs) and non-deposit-taking financial institutions' (NDFIs) exposure to household and corporate sector debt, as measured by debt to assets, have remained relatively moderate and stable overtime. Notably, DTIs' exposure to the household sector increased marginally while DTIs' and NDFIs' exposure to the corporate sector and private sector loans, respectively, remained virtually unchanged relative to 2016. Furthermore, with the exception of corporate sector debt, real annual growth in household and public sector debt remained below pre-global financial crisis average levels, indicative of minimal risk to financial stability. Additionally, DTIs and NDFIs loan quality ratios have continued to improve.

DTIs and NDFIs continued to record lower exposures to sovereign risk during 2017 relative to 2016. The decline in exposure primarily reflected net repayment on two benchmark investment notes during the year.

4.2 Household debt and DTIs' exposure

Growth in household sector debt incurred with DTIs expanded during 2017, albeit at a marginally slower rate relative to 2016 and remained below the pre-global financial crisis levels.^{1,2} This outturn occurred against the background of a relatively stable macroeconomic environment supported by the Bank's accommodative monetary stance, real GDP growth as well as continued declines in unemployment levels. In real terms, household sector debt grew by 8.9 per cent as at end-September 2017 relative to the close of the previous year. This performance compares to growth of 11.9 per cent for 2016 (see **Figure 4.1**). The increase in real household sector debt was primarily driven by consumer loans which had twice the rate of increase for mortgage loans (see **Table 4.1**). Specifically, real consumer and mortgage loans grew by 10.7 per cent and 5.7 per cent at end-September 2017 relative to

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

² Prior to the global financial crisis in 2008, real growth in household sector debt averaged 13.7 per cent for the period 2003-2007.

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

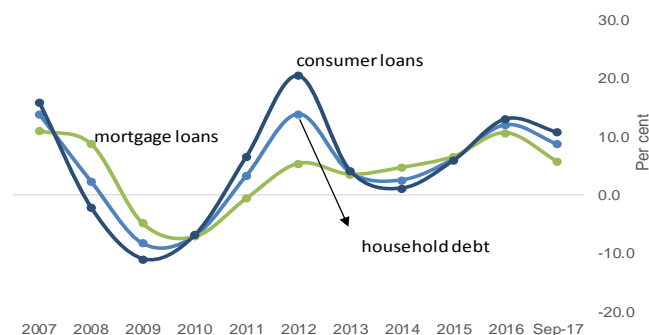


Table 4.1 Selected interest rates & housing data

	2014	2015	2016	Sep-2017	Graphs
Sectoral Interest Rates (per cent)					
Building Societies					
Real Mortgage Loans Rate*	3.1	5.6	7.1	3.9	
Mortgage Loans Rate	9.7	9.5	9.0	8.7	
Average Weighted Loan Rate	9.7	9.5	9.0	8.8	
Commercial banks					
Real Mortgage Loans Rate*	3.1	5.7	7.6	3.9	
Mortgage Loans Rate	9.7	9.6	9.4	8.7	
Installment Credit Rate	16.1	15.2	13.8	12.6	
Personal Credit Rate	25.6	26.2	25.5	24.0	
Commercial Credit Rate	12.9	12.9	12.3	12.3	
Average Weighted Loan Rate	17.2	16.9	16.2	14.6	
Merchant bank					
Personal Credit Rate	17.4	14.7	10.7	12.8	
Commercial Credit Rate	11.3	11.6	11.7	10.5	
Average Weighted Loan Rate	11.9	11.7	11.6	10.6	
Housing Data					
# of Mortgages ^{1/p/}	13 428	15 054	13 490	-	
Value of Mortgages J\$BN ^{1/p/}	34.2	34.7	37.4	-	
Housing Completion ^{2/p/}	2 283	2 382	1 420	-	
Housing Starts ^{2/p/}	2 039	1 467	3 024	-	

* Annual Average Inflation rate used to compute the real mortgage rate.

^{1/} Includes NHT, building societies and non-specialized agencies

^{2/} Includes public sector & private sector

Figure 4.2 Household debt as a share of DTI loans & assets: 2007- September 2017

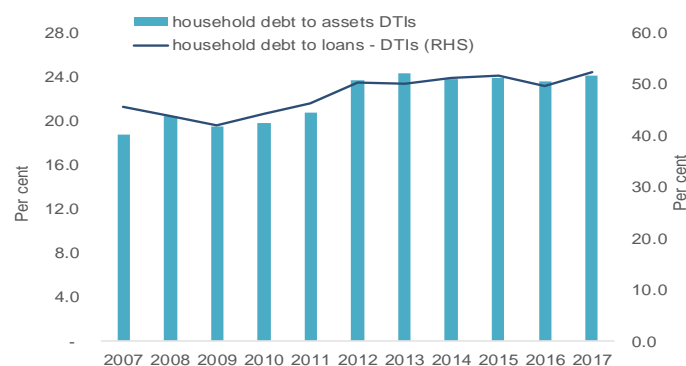


Figure 4.3 DTIs' household sector loan quality & loan loss provisioning to household sector NPLs: 2007- September 2017

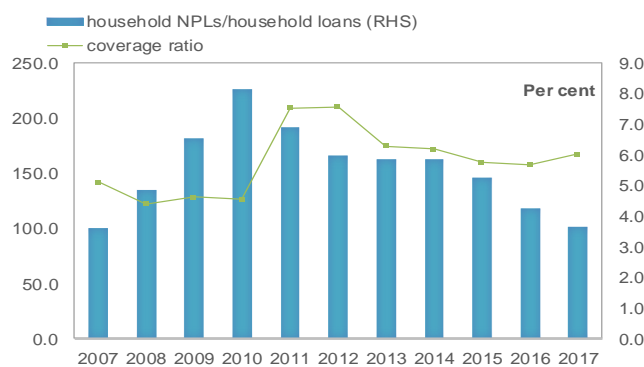


Figure 4.4 Household debt servicing capacity: 2007 – September 2017

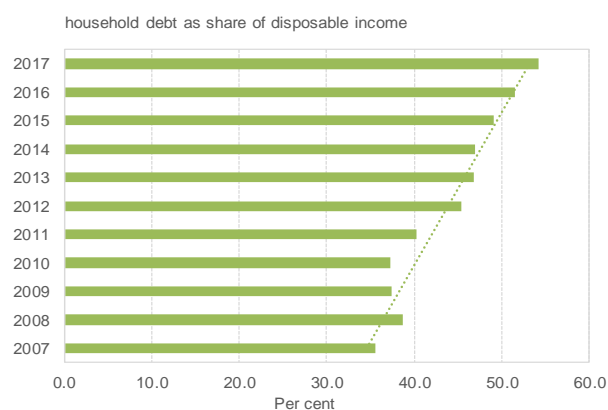
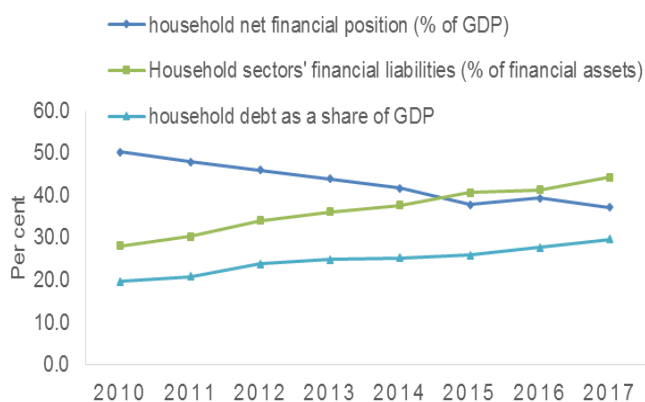


Figure 4.5 Other household sector indebtedness indicators



end-2016, partly reflecting lower interest rates on personal and mortgage credit due to increased competition by institutions in an effort to grow market share.

DTIs' exposure to the household sector as measured by household debt to assets increased marginally to 24.1 per cent as at end-September 2017 relative to end-2016. This performance compares to the 23.6 per cent recorded at the end of the previous year (see **Figure 4.2**). However, the household sector loan quality ratio continued to improve for the review period. Specifically, household non-performing loans (NPLs) as a share of total household loans for DTIs decreased to 3.7 per cent at end-September 2017 relative to 4.3 per cent at end-2016 (see **Figure 4.3**). The improvement in the ratio was largely influenced by net repayments, and net loan write-offs.³ In addition, the increased role of credit bureaus in DTIs' credit adjudication process would have contributed to the improvement in loan quality. Specifically, for the year ending September 2017, net loan write-offs amounted to \$2.5 billion relative to \$3.3 billion for 2016. Furthermore, DTIs' continued to maintain relatively high coverage ratios. The household coverage ratio for the DTI sector grew to 167.7 per cent at end-September 2017 relative to 158.0 per cent at end-2016, reflecting DTIs' strong capacity to absorb potential losses arising from NPLs (see **Figure 4.3**).⁴

4.2.1 Household sector indebtedness

The debt servicing burden of households as measured by total real household debt to real disposable income has generally trended upward since 2011. In particular, the ratio deteriorated by 2.6 percentage points to 54.2 per cent at end-September 2017 relative to end-2016 and was well above the ten-year annual average of 42.9 per cent (see **Figure 4.4**).^{5,6} This outturn was attributed to a faster pace of

³ Net loan write-offs is computed as charge-off loans less bad loans recovered.

⁴ Coverage ratio is measured as the ratio of loan loss provisions plus prudential provisioning to non-performing household loans.

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

increase in household debt of 12.2 per cent relative to growth in disposable income of 6.8 per cent for the review period. Moreover, household debt continued to account for an increasing share of GDP albeit low and relatively stable over time (see **Figure 4.5**). Correspondingly, the financial liabilities to financial assets ratio for the household sector increased marginally to 44.3 per cent relative to 41.3 per cent as at end-2016, partially reflecting increasing levels of debt.⁷ Notably, pension fund deposits continued to account for the largest share of households’ financial assets (41.7 per cent) while mortgage loans accounted for the largest share of financial liabilities (60.3 per cent). Additionally, household sector’s net financial assets as a percentage of GDP deteriorated slightly to 37.1 per cent at end-September 2017 relative to 39.3 per cent at end-2016.

4.3 Corporate sector debt and DTIs’ exposure

DTIs’ exposure to the corporate sector as measured by corporate sector debt to DTIs’ assets remained virtually unchanged at 20.7 per cent at the close of the review period (see **Figure 4.6**).⁸ Of note, real growth in corporate sector debt held by DTIs moderated to 9.4 per cent at end-September 2017. This outturn compares to growth of 28.0 per cent at end-2016 and an average real growth of 8.9 per cent for the 5-year pre-global financial crisis period (see **Figure 4.6**).⁹ This moderation occurred within the context of relatively improved macroeconomic stability as well as increased use of corporate bond issues via exempt distribution. Growth in corporate sector lending was reflected in all economic sectors with the exception of *Agriculture, Manufacturing and Transportation*. Notably, *Construction, Electricity, Gas & Water, Entertainment, and Professional Services* recorded the highest increases ranging between 12.7 per cent and 16.2 per cent for the review period (see **Figure 4.7**).

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 Financial assets of households include: pensions, deposits, on balance sheet retail repos, life assurance and annuity contracts and policyholder funds on deposit. Financial liabilities on the other hand include: consumer loans and mortgage loans.

⁸ Vulnerability is measured as the ratio of corporate sector debt to DTIs’ assets.

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

Figure 4.6 Real growth in corporate sector debt held by DTIs & corporate sector debt as a share of DTIs’ assets: 2007- September 2017

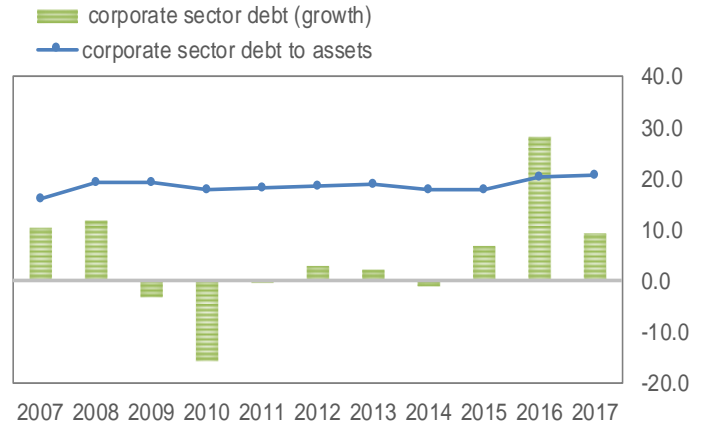
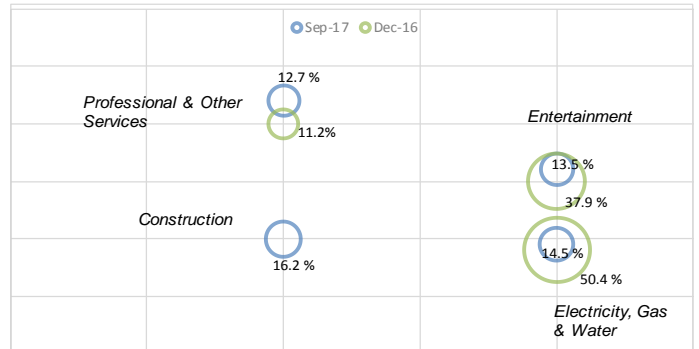


Figure 4.7 DTIs’ exposure to corporate sector loans based on highest growth rates



Note: The growth rate for *construction* was -3.1 per cent at end-2016.

Figure 4.8 Ratio of corporate sector NPLs to corporate sector loans-DTIs: 2007- September 2017

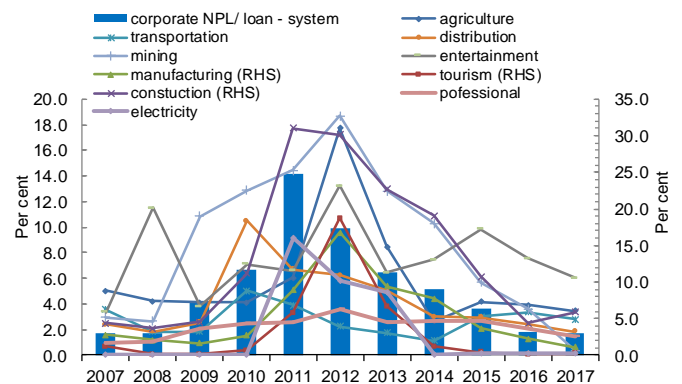


Figure 4.9 Corporate sector debt to corporate operating surplus: 2007 - September 2017

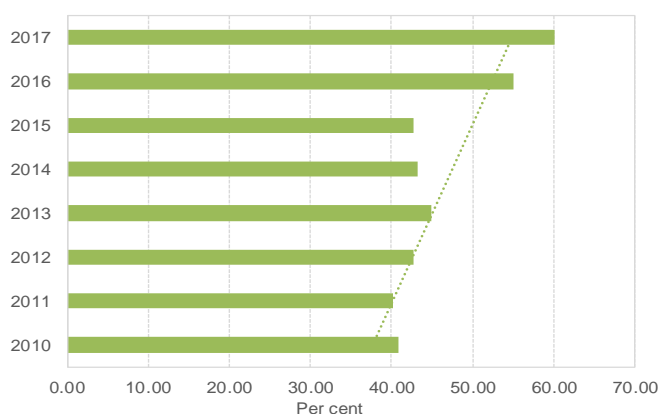


Figure 4.10 Other corporate sector indebtedness indicators: 2007- September 2017

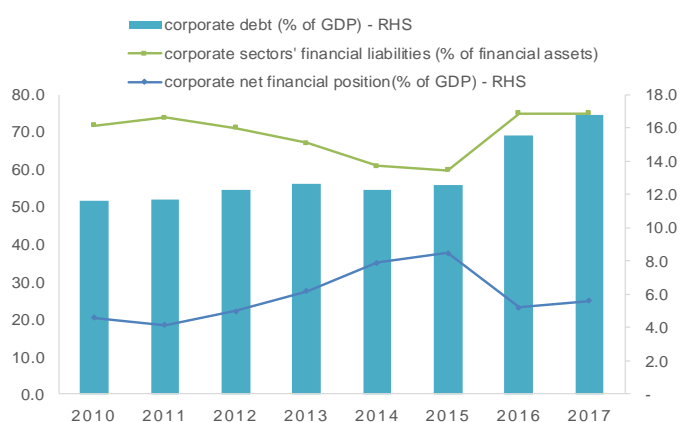
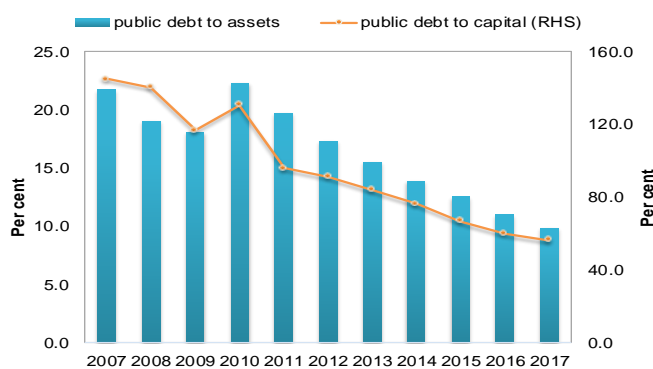


Figure 4.11 Public sector loans and securities to assets & capital – DTIs: 2007- September 2017



4.3.1 Corporate sector loan quality

Corporate sector loan quality continued its trend improvement in 2017. The ratio of corporate sector NPLs to total corporate sector loans declined to 1.7 per cent at end-September 2017, relative to 1.8 per cent at end-2016 (see **Figure 4.8**). The improvement in the asset quality ratio was mainly reflected in the loan portfolio of the commercial banking sector and across all economic sectors except for *Construction and Transport, Storage & Communications*.

4.3.2 Corporate sector indebtedness

The debt servicing capacity of the corporate sector as measured by the share of corporate sector debt to corporate sector operating surplus deteriorated for the review period (see **Figure 4.9**). This performance contributed to increased vulnerability of the DTI sector to the corporates. Additionally, corporate sector net financial position as a share of GDP remained relatively unchanged at 5.6 per cent as at end-September 2017 relative to end-2016.¹⁰ Regarding solvency of the corporate sector, corporate sector financial liabilities as a share of corporate sector assets remained just above 70.0 per cent at end-September 2017. This is similar to the outturn at end-2016 (see **Figure 4.10**).

4.4. Public sector debt & DTIs' exposure

DTIs' exposure to public sector debt declined for the review period. This largely reflected net repayment of two benchmark investment notes (BIN) by the Government of Jamaica as well as the DTIs continuing focus on their core business function of issuing loans during the year. The reduction in DTIs' exposure to public debt was reflected in a decline in the ratio of public sector loans and securities to DTIs' assets to 9.0 per cent at end-September 2017, relative to 11.0 per cent at end-2016 (see **Figure 4.11**).¹¹ This performance was mainly influenced by a 10.2 per cent increase in DTIs' assets as well as a 1.8 per cent decline in public sector securities for the review period.

¹⁰ The Financial assets of corporates include: deposits and retail repos. Corporate financial liabilities on the other hand include: loans for commercial purposes as well as notes & debenture holdings of DTIs.

¹¹ Exposure to public sector debt is measured by public sector loans and securities as a share of DTIs' assets. The public sector comprises public entities and Central Government.

4.4.1 Public sector performance & indebtedness

Consistent with the Government's efforts to reduce its debt, public sector debt as a share of GDP declined to 106.3 per cent at end-2017 from 122.3 per cent at end-2016. This mainly reflected a faster pace of decline in the public sector debt stock relative to GDP growth (see **Figure 4.12**). The reduction in the public sector debt stock was influenced by the performance of both external and domestic debt. For 2017, the external and domestic debt stock declined by 9.8 per cent and 9.1 per cent, respectively (see **Figure 4.13**). The decline in the external debt stock was mainly attributed to the exclusion of BOJ debt as well as revaluation due to appreciation of the domestic currency vis-à-vis the US dollar. On the other hand, the reduction in the domestic debt stock for 2017 was mainly attributed to bond repayments.

The fiscal stability ratio (FSR) which captures the stability of government finances improved to -0.96 at end-2017 relative to 1.01 at end-2016.¹² This performance occurred against the background of higher revenues and grants relative to expenditure which resulted in a fiscal surplus relative to a fiscal deficit recorded the previous year. Regarding other debt sustainability indicators, there were mixed results for 2017. In particular, debt servicing to budgetary revenues deteriorated marginally. However, interest payments to GDP and external debt to exports of goods and services improved (see **Figure 4.14**).

There was a lengthening of the maturity profile of domestic debt for 2017 relative to 2016. More specifically, the proportion of domestic debt due to mature in 5 years or less decreased to 36.2 per cent at end-2017 from 42.6 per cent at end-2016, reflecting a reduction in refinancing risk for the Government (see **Figure 4.15**). Additionally, domestic fixed rate instruments continued to account for the largest share of the total debt stock. In particular, for 2017, the share of domestic fixed rate instruments as a share of the total debt stock was 55.6 per cent compared to a ratio of 44.4 per cent for variable rate instruments (see **Table 4.2**).

Figure 4.12 Debt to GDP ratios

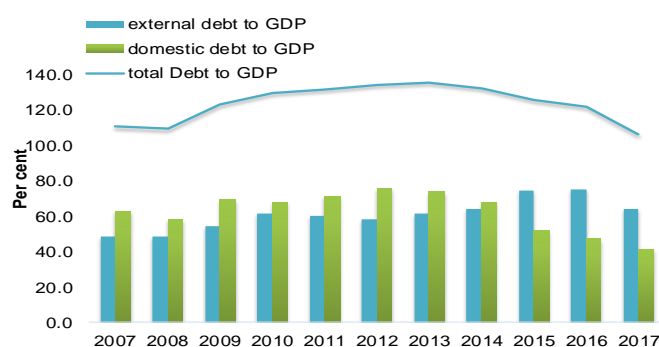


Figure 4.13 Growth in public sector debt stock

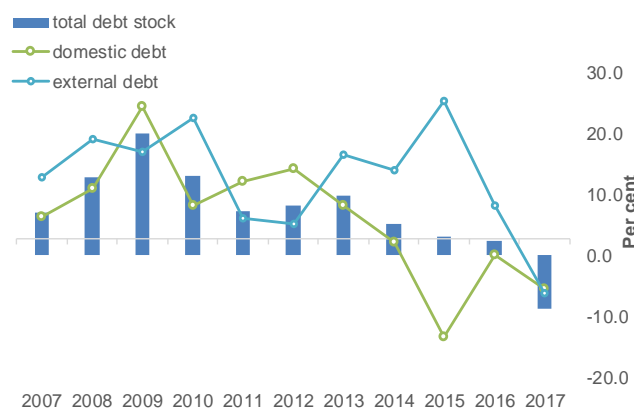
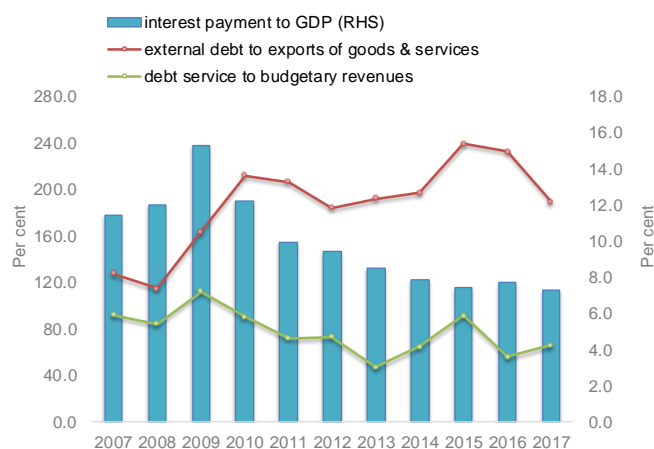


Figure 4.14 Debt sustainability indicators



¹² 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.

Figure 4.15 Domestic debt by maturity

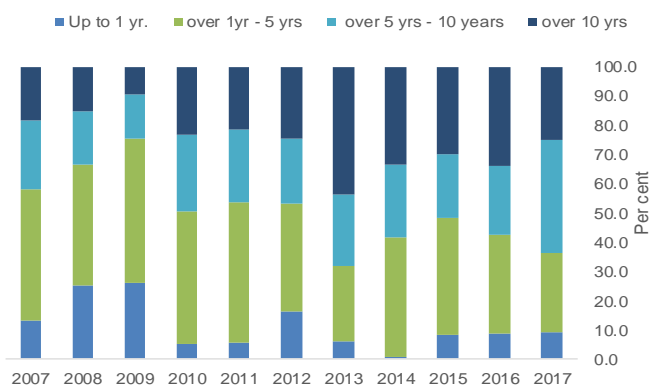
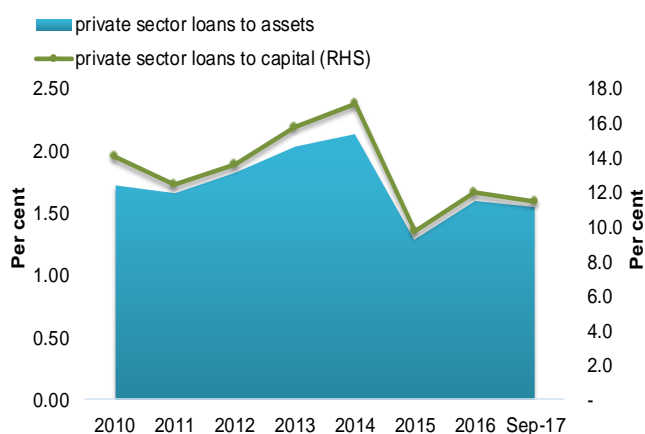


Table 4.2 Share of domestic debt by instrument type

	Fixed rate	Variable rate	Non Interest Bearing Debt
2007	37.9	62.0	0.1
2008	38.0	62.0	0.0
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	55.6	44.4	0.0

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



4.5. Non-deposit-taking financial sector exposure

4.5.1 Securities dealers' exposure to private sector debt

Exposure of the twelve core SDs to private sector debt remained low for the review period.^{13,14} The ratio of private sector debt to assets for the SDs was virtually unchanged at 1.6 per cent at end-September 2017 relative to the close of the previous year (see **Figure 4.16**). Furthermore, private sector debt held by SDs as a proportion of capital was 11.4 per cent at end-September 2017 which represented a decline of 0.5 percentage point, relative to end-2016. This was largely attributable to a faster increase in capital relative to the increase in private sector debt. Notably, of the twelve SDs, only seven institutions had exposure to private sector debt. This outturn was similar to that which obtained as at end-2016.

SDs' loan quality ratio, as measured by private sector NPLs to private sector loans, increased slightly to 3.4 per cent at end-September 2017, relative to 3.1 per cent at end-2016 (see **Figure 4.17**). This deterioration, however, was well below the 12.2 per cent average for the past five years and largely reflected the operations of one institution. Similarly, the coverage ratio for SDs declined to 109.7 per cent at end-September 2017 relative to 116.0 per cent at end-2016. Nonetheless, the ratio reflected adequate coverage for loan losses.

4.5.2 Public sector debt & securities dealers' exposure

SDs' exposure to public sector debt continued to decline during the review period.¹⁵ This performance occurred against the background of the retail-repo phase-down, net repayment on two BIN during 2017 as well as efforts to remove the cap on foreign currency investments for SDs. The ratio of public sector debt to SDs' assets declined to 24.5 per cent at end-September 2017 from 28.0 per cent at

¹³ Private sector loans include loans to corporate sector entities and personal (household) loans.

¹⁴ SDs represents 12 securities dealers that account for approximately 70.0 per cent of the securities market. Their business model is predominantly securities dealing activities and include the top 5 largest SDs.

¹⁵ Public sector debt is measured as the sum of public sector loans and public sector securities, while exposure is defined as public sector debt as a proportion of assets.

end-2016 (see **Figure 4.18**). Furthermore, this outturn was largely in keeping with the various reforms in the sector aimed at reducing risks emanating from SDs to the wider financial system. Similarly, public sector debt holdings to capital declined to 180.7 per cent at end-September 2017 from 210.4 per cent at end-2016.

4.5.3 Public sector debt & insurance sector exposure

Regarding the insurance sector, similar to the SDs, exposure to public sector debt declined marginally for the review period. The ratio of public sector debt holdings to insurance assets declined to 44.1 per cent at end-September 2017 relative to 44.9 per cent at end-2016 (see **Figure 4.19**). In particular, this ratio was 48.0 per cent and 28.3 per cent for the life and general insurance companies, respectively, at end-September 2017 relative to respective ratios of 48.6 per cent and 29.4 per cent for end-September 2017 relative to respective ratios of 48.6 per cent and 29.4 per cent at end-2016. As a share of capital, public sector debt holdings for the insurance sector declined to 179.9 per cent at end-September 2017 relative to a ratio of 188.0 per cent at end-2016, consistent with a decline in public sector debt (see **Figure 4.20**).

4.6 Other asset exposure

Exposure to other asset categories including equities and real estate remained relatively low across the NDTFI sector during 2017.¹⁶ Nonetheless, exposure to equity and real estate investments increased marginally over the review period. Specifically, the ratio of equity investments as a proportion of assets increased to 2.2 per cent and 9.0 per cent as at end-September 2017 relative to 1.4 per cent and 8.7 per cent for SDs and insurance companies, respectively at end-2016. Regarding real estate investments, there was a slight increase in exposure for the insurance sector to 1.0 per cent as at end-September 2017 relative to 0.9 per cent at end-2016, largely reflecting activities within the life insurance sub-sector (see **Figure 4.22**).¹⁷

Figure 4.17 Private sector NPLs to total private sector loans & coverage ratio for securities dealers

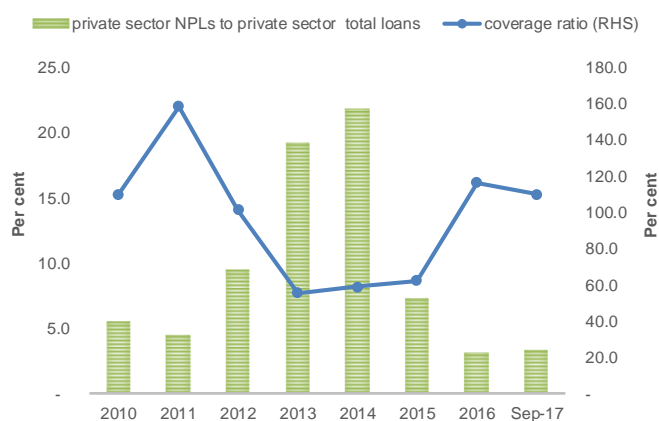


Figure 4.18 Public sector debt holdings to assets & capital for securities dealers

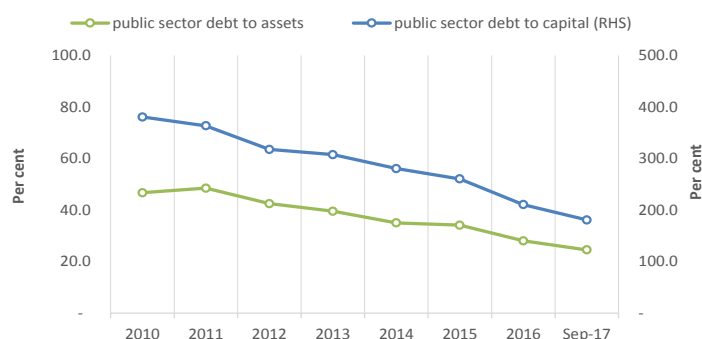
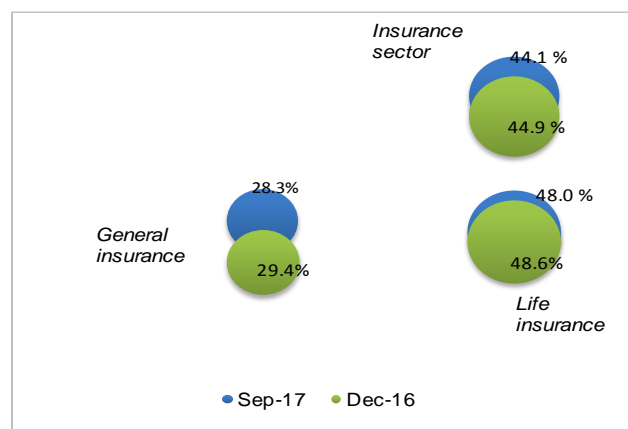
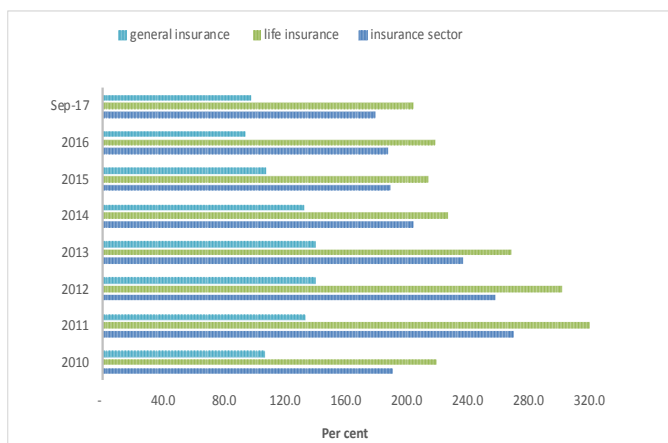
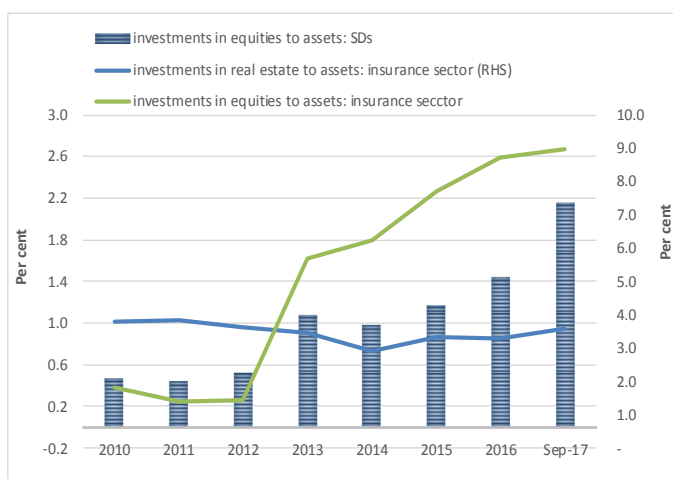


Figure 4.19 Public sector debt holdings to assets for insurance companies



¹⁶ DTIs are restricted from holding real estate for investment purposes, however, any equity investments is limited to 10.0 per cent of regulatory capital.

¹⁷ Real estate investments include only the on-balance sheet positions for the insurance companies.

Figure 4.20 Public sector debt holdings to capital for the insurance sector**Figure 4.22** Investments in other assets for the DTIs, SDs & insurance sector**Table 4.2** Investment classes as a per cent of total assets pensions industry

	2012	2013	2014	2015	2016	Sep-2017
Investments in Governments Securities to Assets (%) ^{1/}	43.9	42.5	40.5	33.6	30.4	26.1
Investments in Equities to Assets (%)	10.3	9.8	9.3	14.6	17.0	20.3
Investments in Real Estate to Assets (%)	6.0	5.9	5.8	5.4	4.8	4.0
Investment Arrangements to Assets (%) ^{2/}	26.9	29.0	29.5	32.8	36.6	38.0
Other Investments to Assets (%)	11.8	12.1	14.1	13.2	11.1	11.5
Total Asset values (J\$Bn)	294.1	307.1	341.4	396.9	453.1	513.3

Notes

^{1/} Government securities includes Government of Jamaica securities and other sovereign securities from the US, UK and Canada.^{2/} An investment arrangement describes investments in deposit administration contracts and pooled funds.**4.7 Pension industry exposure to government securities, equities & real estate**

At end-September 2017, the pension industry continued to have the highest exposure to investment arrangements as well as investments in government securities, relative to other investment classes (see **Table 4.2**).^{18,19} For the review period, exposure to investment arrangements and investments in government securities was 38.0 per cent and 26.1 per cent, respectively.²⁰ This compares to 36.6 per cent and 30.4 per cent, respectively, recorded at end-2016, reflecting a shift away from investment in government securities. For the same period, there was an increase in exposure to equity investments to 20.3 per cent from 17.0 per cent at the end-2016. However, pension fund exposure to real estate continued to decline.

¹⁸ Pension industry refers to private pension plans within the regulatory oversight of the Financial Services Commission.¹⁹ Exposure is computed as a per cent of total assets.²⁰ Investment arrangements includes pooled funds and deposit administration contracts.

5. Risks Assessment of the Financial Sector

5.1 Overview

Stress tests conducted during 2017 showed that DTIs generally remained robust to hypothetical liquidity, market, and credit shocks, given generally reduced exposures and stronger capital positions. On average, exposures to foreign exchange, liquidity and credit risks decreased for 2017, while average exposures to interest rate risks increased relative to the previous year. Notwithstanding an increase in average interest rate exposure, there was an increase in DTIs' median post-shock CAR, relative to 2016, due to the sector's stronger capital positions.

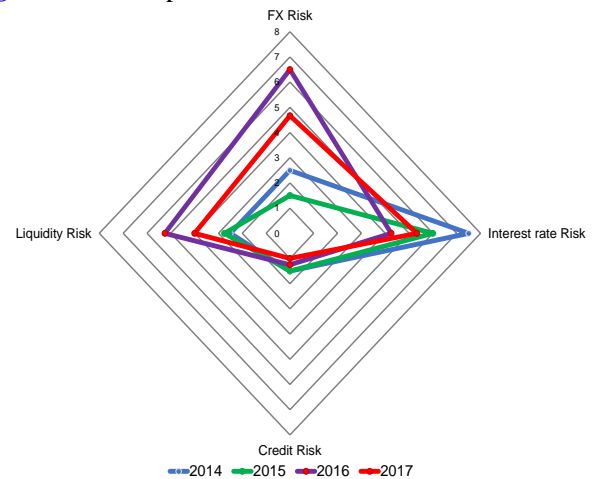
NDTFIs generally remained resilient to a wide range of foreign exchange and liquidity shocks during the first three quarters of 2017. In addition, although the securities dealers sector remained susceptible to interest rate risks, there was reduced vulnerability to hypothetical interest rate shocks largely due to lower fair value losses relative to 2016. Furthermore, during the review period, the SDs sector showed reduced susceptibility to combined hypothetical shocks while the insurance sector showed continued resilience to these shocks.

5.2 Risk exposure assessment for DTIs

DTIs' average exposure to financial risks were largely reduced for the first three quarters of 2017 relative to 2016. In particular, the financial risk exposure “cobweb” diagram reflected declines in foreign exchange, credit and liquidity risks (see **Figure 5.1**). These results reflected positive developments in key variables such as NPLs, NOP, loans to non-foreign exchange earners and liquid assets.

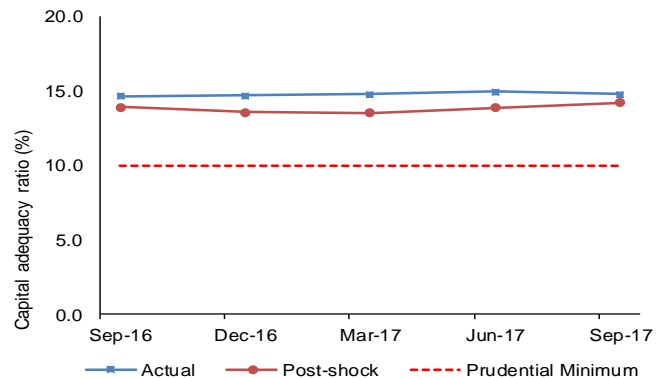
In addition, aggregate stress test results as at end-September 2017 showed that the DTI sector remained resilient to combined interest rate, liquidity, foreign exchange and credit shocks. These results also showed improvements as at end-September 2017 relative to end-2016 mainly due to a reduction in credit risk exposure and stronger capitalization (see **Figure 5.2**).

Figure 5.1 Risk exposures of DTIs



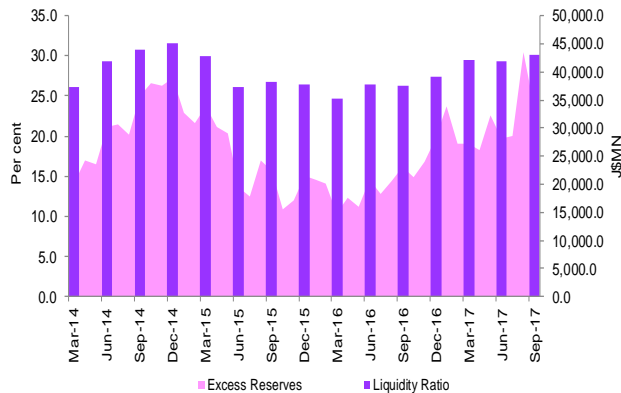
Note: Movements away from the centre of the diagram represent an increase in DTIs risk exposures. The credit, interest rate foreign exchange, liquidity and counterparty risk dimensions reflects the major classes of risks faced by DTIs. Risk exposure indicators are: (i) Foreign exchange risks – Net open 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 5.2 Impact of scenario based aggregate stress test on the CAR of the DTI sector¹



¹ The aggregate stress test framework at end-September 2017 involves an assessment of the simultaneous impact of: increases in interest rates, currency depreciation, credit quality deterioration and deposit outflow: 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; and 10.0 per cent reduction in deposits or repurchase liabilities.

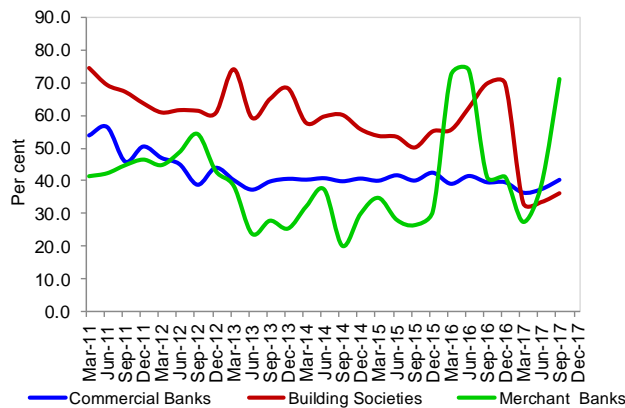
Figure 5.3 Trends in the liquidity ratio and excess reserves



5.3 Liquidity funding risk assessment for DTIs

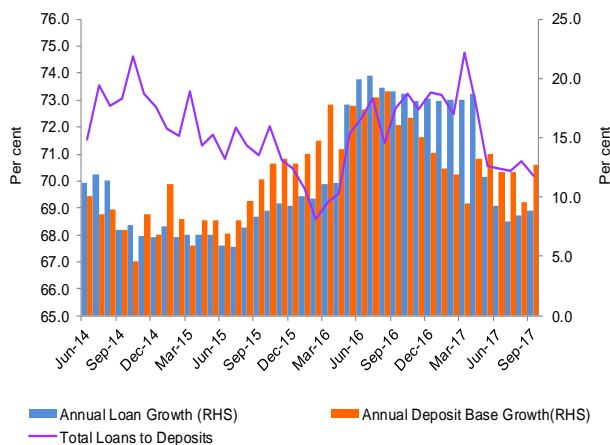
Against the background of improved Jamaica Dollar liquidity conditions during most of 2017, domestic currency liquidity risk exposure of DTIs declined during the year. This performance reflected improvements in some key measures of liquidity risk for the review period. In particular, the ratio of liquid assets to average prescribed liabilities for the sector increased to 30.1 per cent at end-September 2017 relative to 27.4 per cent at end-2016. Of note, the dollar value of DTIs’ reserves of liquidity in excess of those prescribed by the Bank was also above the level recorded at the end of the previous year (see **Figure 5.3**).

Figure 5.4 The ratio of assets maturing within 3 –months to liabilities maturing within 3 - months for DTIs



Concurrently, there was improvement in the ratio of short-term assets to short-term liabilities for the merchant bank and commercial bank sub-sectors, which influenced an improvement in the ratio for the sector during the review period (see **Figure 5.4**). More specifically, the ratio for the merchant bank sub-sector increased by 30.0 percentage points to 71.1 per cent. In addition, the ratio for commercial banks increased by 0.7 percentage point to 40.2 per cent at end-September 2017, relative to the close of the previous year. Additionally, the loans-to-deposit ratio for the DTI sector decreased by 3.1 percentage points to 70.2 per cent at end-September 2017 relative to end-2016 (see **Figure 5.5**). At the same time, this ratio remained below 100.0 per cent, indicative of continued and increased viability in meeting short-term liquidity needs.

Figure 5.5 Loans to deposit ratio – DTI Sector



Regarding funding sources, deposits continued to account for the dominant share of DTIs’ funding base. However, deposits as a proportion of total funding declined marginally to 63.6 per cent at end-September 2017 relative to 64.0 per cent at end-2016. Similarly, ‘repos’ as a source of total funding decreased to 4.8 per cent relative to 5.9 per cent at the close of the previous year while ‘other funding’ liabilities as a share of total funding increased to 6.9 per cent relative to 4.3 per cent at end-2016.

As it relates to funding risk stress tests results, all DTIs were adequately capitalised to absorb losses associated with hypothetical declines in deposits during the first three quarters of 2017. For example, following a hypothetical 10.0 per cent decline in average deposits, the post-shock CARs for all DTIs remained above the regulatory benchmark of 10.0 per cent.² However, there was a decline in the interquartile range of post-shock CARs for the system during the review period. It would take a 63.0 per cent reduction in deposits as at end-September 2017, for the CAR of the DTI sector to breach the statutory benchmark of 10.0 per cent, which is similar to the result obtained at end-2016. These results are indicative of insignificant changes in vulnerability of DTIs to liquidity funding risk during the review period, due to consistently strong capital and liquidity positions (see **Figures 5.6 & 5.7**).

5.4 Market risk assessment of DTIs

The DTI sector reflected a decline in the Jamaica Dollar value of foreign currency securities held during the review period. This reduction mainly reflected reduced holdings in foreign currency investments as DTIs adjusted portfolios within the context of appreciation of the domestic currency, particularly during the June quarter (see **Figure 5.8**). Against this background, foreign currency securities as a share of the total investment portfolio decreased to 59.6 per cent and 18.9 per cent at end-September 2017 for the commercial banks and building societies, respectively, relative to 61.0 per cent and 61.6 per cent at end-2016. However, during the first three quarters of 2017, the merchant bank sub-sector showed a decrease in the Jamaica Dollar value of foreign currency securities as well as a reduction in total investments which resulted in an increase in the share of foreign currency investments to total investments. Notwithstanding, the merchant banks sector continued to hold the largest

Figure 5.6 Distribution of liquidity funding risk stress test results for DTIs (10.0 per cent decline in average deposits)

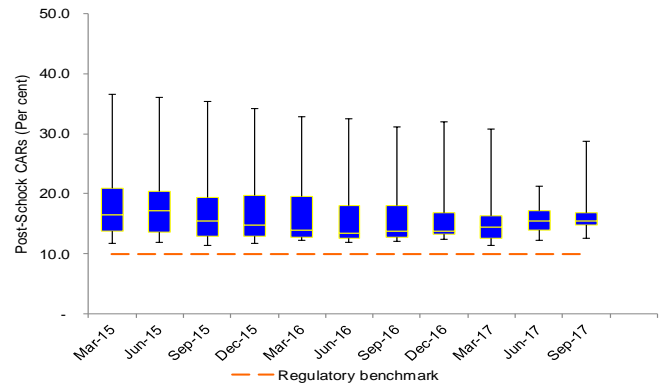


Figure 5.7 Liquidity funding risk stress test results for DTIs

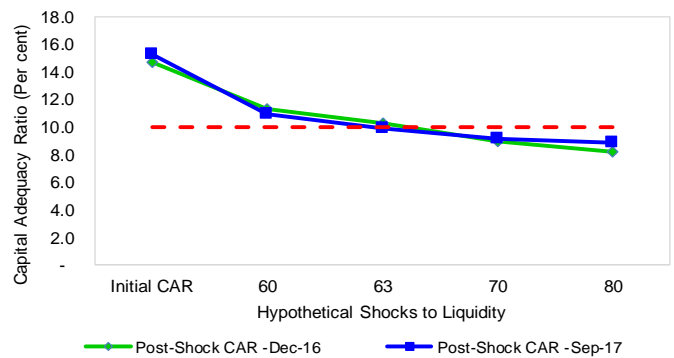
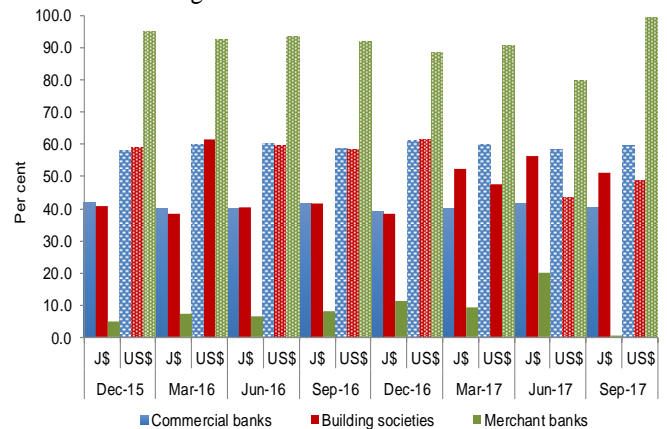


Figure 5.8 DTIs' domestic currency and foreign currency investment holdings as a ratio to total investments



² The 'hair cuts' (per cent loss in value) applied in the stress testing framework on liquidating each category of assets are 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). The resultant hypothetical losses are written off against the capital buffers first and then statutory capital.

Figure 5.9 Interquartile range for post-shock CARs due to interest rate risk stress tests of DTIs (impact on CAR of 1100 bps/ 100 bps & 275 bps/ 15 bps shock to interest rates)³

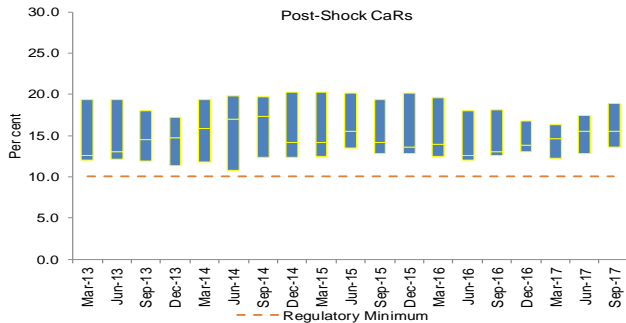


Figure 5.10 Quarterly ratio of DTI net open position to tiered capital

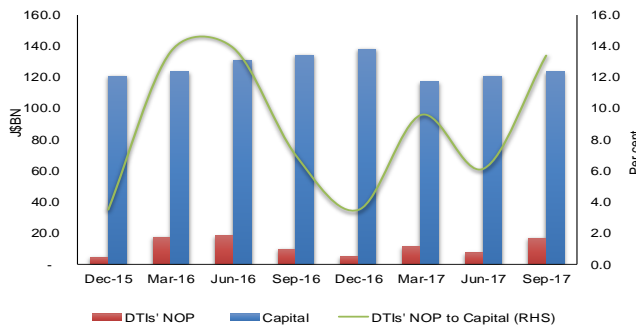
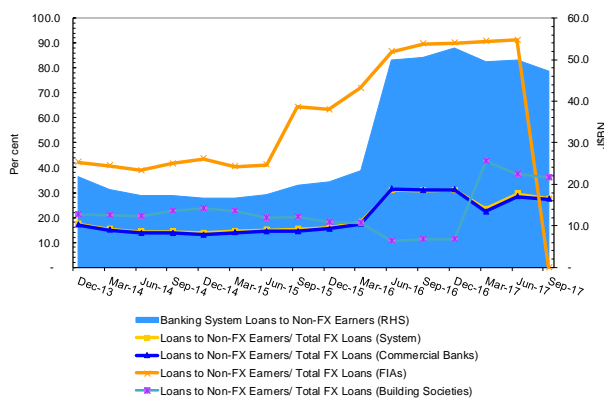


Figure 5.11 Analysis of foreign loans to non-foreign currency earners for DTIs⁴



³ 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.

⁴ The larger merchant bank transferred operations to the commercial banking sub-sector, resulting in a significant fall off in foreign currency loans within the merchant bank sub-sector.

proportion of their portfolio in foreign currency securities. At end-2016, foreign currency securities accounted for 99.6 per cent of the investment portfolio of the merchant bank sub-sector.

5.5 Interest rate risk assessment for DTIs

At end-September 2017, interest rate risk stress tests results showed that DTIs were less vulnerable to hypothetical increases and decreases in interest rates. The median quarterly post-shock CAR of DTIs increased during the review period, relative to the previous year following a hypothetical increase in interest rates (see **Figure 5.9**). Furthermore, as at end-September 2017, all DTIs were adequately capitalised to absorb losses associated with large but plausible hypothetical increases in interest rates, with the CAR of all DTIs remaining above the 10.0 per cent CAR prudential benchmark. However, at end-2016 the CAR of one DTI fell below the prudential benchmark, in response to the aforementioned interest rate shocks.

5.6 Foreign exchange risk assessment for DTIs

DTIs' NOP increased to \$16.6 billion at end-September 2017 (see **Figure 5.10**).⁵ Consequently, the NOP to capital ratio for the DTI sector increased to 13.4 per cent at end-September 2017, relative to end-2016, reflective of increased foreign currency risks, particularly during the September quarter.

The increase in DTI's aggregate NOP for 2016 was due to the increased long position for all DTI sub-sectors, but largely commercial banks. However, DTIs' foreign currency exposure to non-foreign currency earners decreased during the review period relative to the previous year. In particular, loans to non-foreign exchange earners as a proportion of total foreign currency loans decreased to a quarterly average of 26.8 per cent for the review period compared to an average of 27.7 per cent for 2016 (see **Figure 5.11**).⁶

⁵ Long position in foreign currency assets include all currencies converted to US dollars.

⁶ 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.

Despite the increase in foreign currency risk as measured by NOP to capital, DTIs remained generally resilient to both hypothetical depreciation and appreciation of the Jamaica Dollar vis-à-vis the U.S. dollar during the calendar year to end-September 2017, as institutions were adequately capitalized to absorb losses associated with these shocks. Furthermore, subsequent to a hypothetical 30.0 per cent depreciation, the average median post-shock CAR across all DTIs was higher during the review period, relative to 2016 (see **Figure 5.12**).⁷ The reduced susceptibility of the DTI sector to the hypothetical depreciation shock for the calendar year to September 2017 partly reflected the impact of increases in the NOP of these institutions. Building societies remained most resilient to the shocks applied for the review period, despite a marginally lower quarterly average post-shock CAR for the sub-sector relative to 2016. However, all DTI subsectors showed improved responses to the hypothetical depreciation shocks applied.

The post-shock CARs of these institutions remained above the 10.0 per cent prudential benchmark for the review period. In addition, DTIs also remained resilient to all the hypothetical appreciation shocks that were examined.

5.7 Credit risk assessment of DTIs

DTIs' exposure to credit risk improved during the calendar year to end-September 2017. The loan quality ratio, as measured by the ratio of NPLs to total loans for the sector, declined to 2.6 per cent at end-September 2017 relative to 2.9 per cent at end-2016 which reflected improvement in the ratios for all DTI sub-sectors. The merchant banks sub-sector reflected the most pronounced improvement in loan quality, driven by a substantial decline in NPLs, with the NPLs to total loan ratio declining to zero per cent at end-September

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

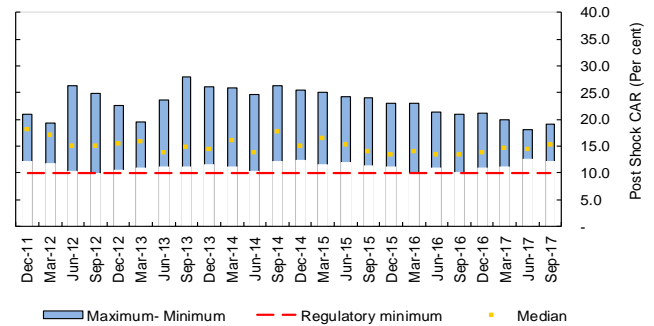


Figure 5.13 Credit risk exposure for DTIs at end-September 2017 (scenario: 100.0 per cent write-off of past due loans less than 3 months)

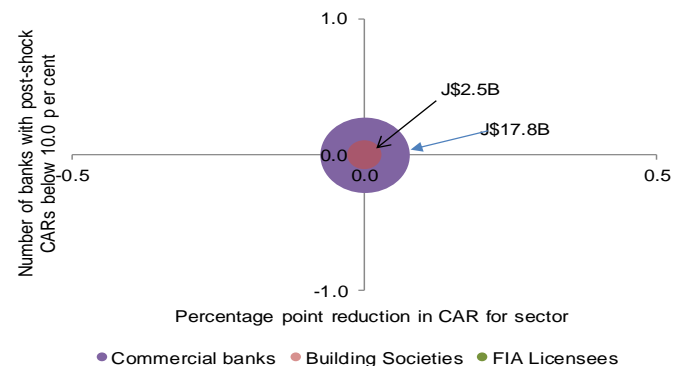


Figure 5.14 NPL coverage ratios for DTIs and write-off rates for NPLs for commercial banks

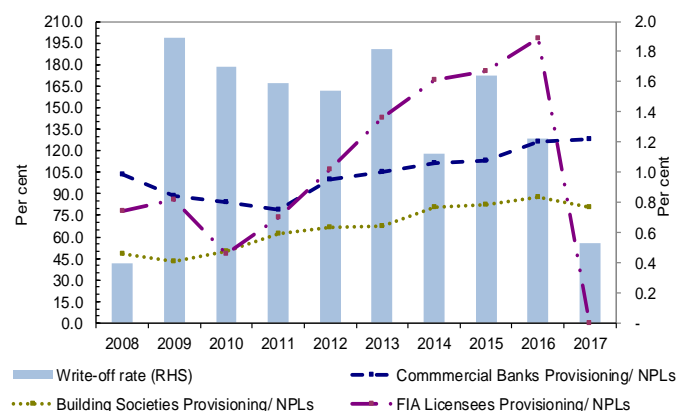


Figure 5.15 Distribution of NPLs to capital base for DTIs

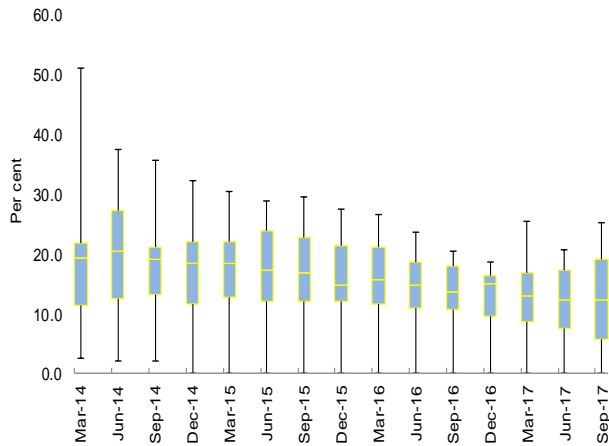


Figure 5.16 Credit risk stress test results for DTIs (Scenario: Impact on CAR of a 30% increase in NPLs)

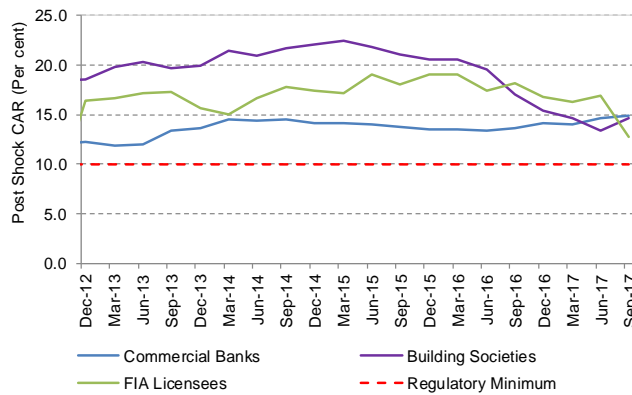
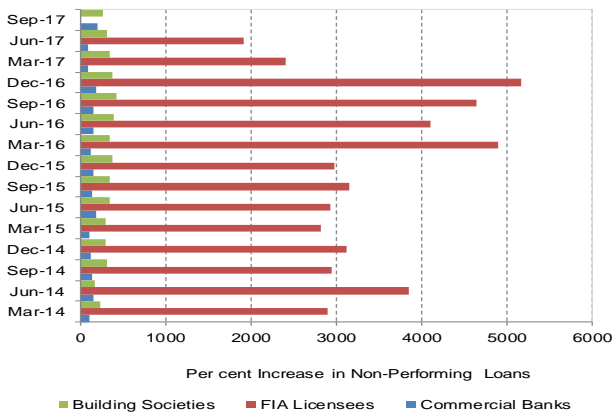


Figure 5.17 Reverse stress testing the credit risk exposure of DTIs



2017 relative to a ratio of 0.8 per cent at end-2016. For the commercial banks sub-sector, the ratio declined to 2.5 per cent at end-September 2017 relative to 2.7 per cent at end-2016. This occurred alongside a decline in the write-off ratio for commercial banks, measured as loan write-offs as a per cent of total loans, to 0.5 per cent at end-September 2017 relative to 1.2 per cent at end-2016 and was below the five-year historical average. However, the loan quality ratio for the building societies sub-sector increased marginally to 3.8 per cent at end-September 2017, relative to 3.7 per cent at end-2016 (see **Figure 5.13**).⁸

Against the background of strong declines in NPLs for the commercial banks and merchant banks for the calendar year to end-September 2017, the NPL coverage ratios for both sub-sectors increased. The NPL coverage ratio for the commercial banking sector increased to a value of 128.2 per cent at end-September 2017 relative to 126.1 per cent at end-2016. However, the NPL coverage ratio for the building societies decreased to 80.9 per cent at end-September 2017 relative to 87.5 per cent at end-2016. Notwithstanding, the maximum ratio of NPLs to capital recorded across all DTIs increased to 25.3 per cent at end-September 2017 from 18.3 per cent at end-2016 (see **Figure 5.14**). Furthermore, there was a widening of the inter-quartile range of NPLs to capital for DTIs, which underscored higher exposure to credit risk for three institutions. This ratio was within an inter-quartile range of 5.8 per cent to 19.2 per cent at end-September 2017 relative to values of 9.6 per cent to 16.4 per cent at end-2016 (see **Figure 5.15**).

Stress test results at end-September 2017 showed that each sub-sector was adequately capitalized to absorb a hypothetical 30.0 per cent increase in NPLs (see **Figure 5.16**). In particular, there was an improvement in commercial banks' resilience to this hypothetical increase in NPLs for the review period. This was largely due to improved loan quality

⁸ Write-off rate is computed as the ratio of “charged off assets” for the year to “loans, advances & discounts (net of provisions)”.

and stronger capitalisation during the calendar year to end-September 2017. Further, the merchant banks and building societies sub-sectors have also remained resilient to large but plausible hypothetical shocks to NPLs.

Reverse stress testing exercises showed that within the commercial banks sub-sector, it would take an increase in NPLs of 199.0 per cent at end-September 2017 for the first commercial bank to breach the CAR benchmark relative to an increase of 182.0 per cent at end-2016 (see **Figure 5.17**). However, the building societies sub-sector showed increased susceptibility to reverse stress testing assessments. It would require a lower increase in NPLs of 265.0 per cent for the CAR of the most vulnerable institution to fall below 10.0 per cent, relative to an increase of 370.0 per cent in NPLs at end-2016.⁹ In terms of the overall DTI sector, it would take a higher hypothetical 457.0 per cent increase in NPLs at end-September 2017 for the CAR of the DTI sector to breach the prudential minimum, relative to an increase of 450.0 per cent at end-2016 (see **Figure 5.18**).

5.8 Overall Risk Exposures of SDs¹⁰

Based on the cobweb map of risk exposures for the SDs' sector, there was deterioration in the exposure of these institutions to foreign exchange risks and credit risks at end-September 2017 relative to the close of the previous year (see **Figure 5.19**). Regarding the SDs' stronger exposure to foreign exchange risks, this performance was due to increases in the NOP to capital ratio while the performance of the credit risk dimension was impacted by marginal increases in the NPLs to total loans ratio.¹¹ Nonetheless, these institutions' exposure to liquidity risk and interest rate risk improved during the review period.

⁹ 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.

¹⁰ The analysis is based on a representative sample of twelve SDs that makes up 70.0 per cent of the market.

¹¹ DVBP is the loss in net interest income generated from 100 bps shocks to the system's foreign and domestic securities portfolio and reported as a percentage of the system's capital base.

Figure 5.18 Impact on DTIs' CAR from an increase in NPLs

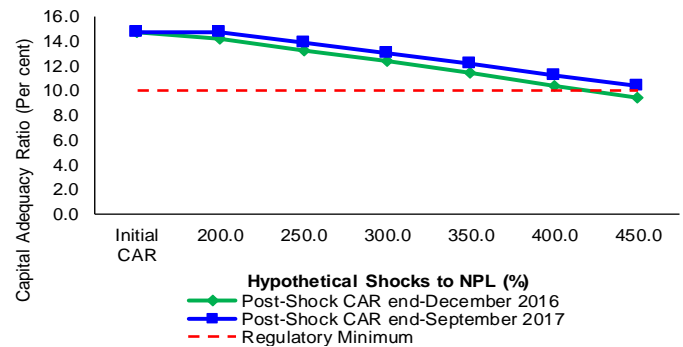


Figure 5.19 Evolution of risk exposure indicators for SDs

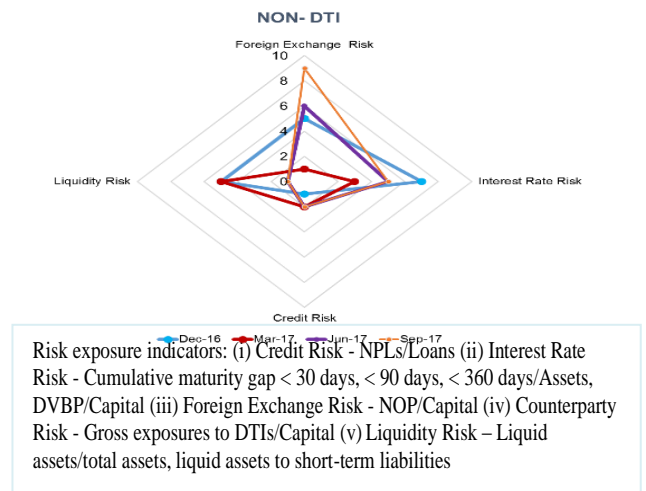


Figure 5.20 Impact of Scenario based aggregate stress tests on SDs' CARs

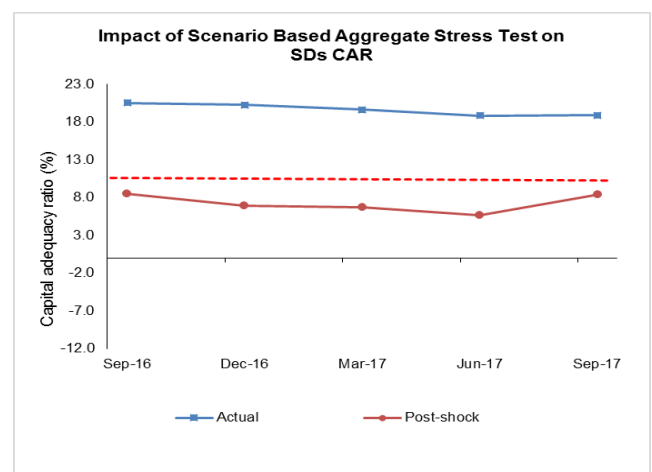


Figure 5.21 Liquidity funding risk stress test results for - SDs (Scenarios: 10.0 per cent to 50.0 per cent decline in Retail Repo-liabilities)

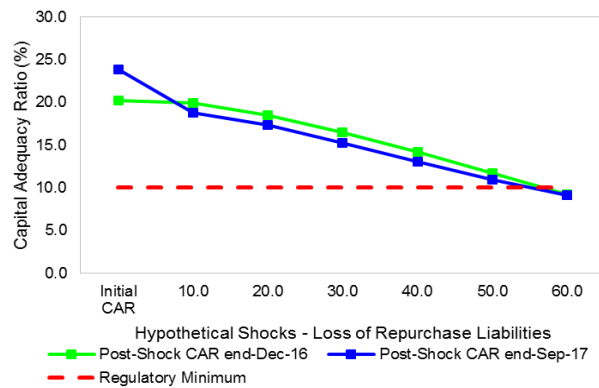


Figure 5.22 The ratio of assets maturing within 3-months to liabilities maturing within 3-months for SDs

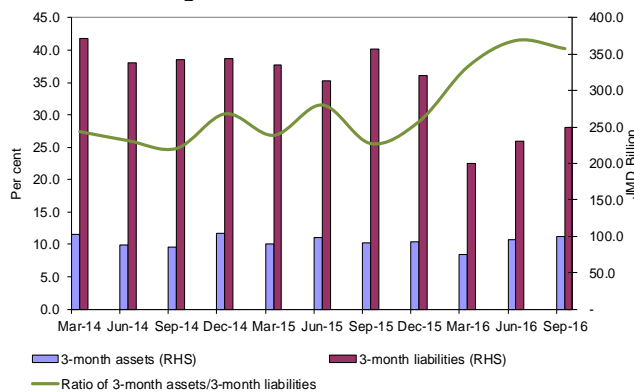
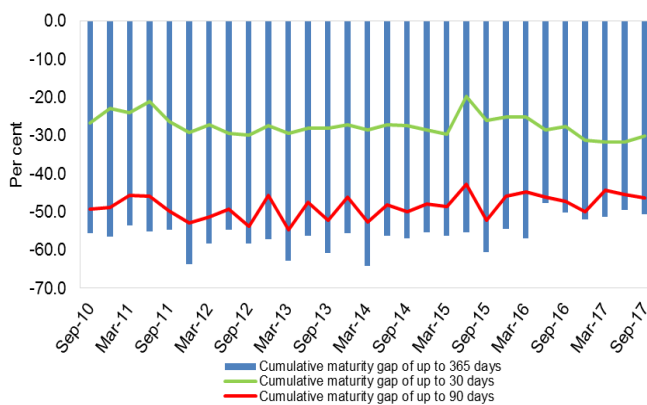


Figure 5.23 Cumulative gap to asset positions – SDs



These developments occurred against the background of stable macro-economic conditions, in particular continued declines in domestic interest rates. The fall in liquidity risk exposure was due to increases in SDs’ liquid assets position while the decrease in interest rate risk exposure predominantly reflected improvements in these institutions’ short-term maturity position, in particular, the cumulative maturity gap position to asset ratio for periods up to 30-days and 90-days (see **Figure 5.21**).

Furthermore, in relation to the SDs’ exposure to combined hypothetical shocks, results at end-September 2017 showed that the sector’s exposure to these aggregate shocks improved relative to its performance at the close of 2016.¹² The lower exposure of the SDs sector to these shocks was largely reflective of reduced exposure to interest rate and liquidity risks (see **Figure 5.20**).

5.9 Liquidity Funding Risk Assessment of SDs¹³

Stress test results based on data at end-September 2017 showed that SDs continued to be resilient to hypothetical reductions in repo liabilities. A breakpoint assessment was conducted to determine the magnitude of decline in repo liabilities which would result in these institutions’ CAR falling below 10.0 per cent. In particular, it would take a 57.0 per cent reduction in retail repo liabilities for the CAR of the SD sector to fall below the 10.0 per cent benchmark, which is relatively in line with the result at end-2016, when a shock of 58.0 per cent would bring the sector CAR below 10.0 per cent

¹² 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.

¹³ 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.

(see **Figure 5.21**).¹⁴ This resilience occurred within a context where there were further declines in these institutions' holdings of repo liabilities during 2017, due to the continued phasing down of the retail repo business model. As such, retail repos as a share of total liabilities declined to 17.9 per cent at end-September 2017 relative to 19.0 per cent at end-2016.

Within the context stronger liquidity conditions, there was also improvement in key liquidity indicators for the SD sector during the first nine months of 2017. Of note, the ratio of liquid assets to total assets increased to an average of 13.4 per cent for the first three quarters of 2017 from an average of 11.0 per cent for 2016. There was also a narrowing of the cumulative 30-day and cumulative 90-day maturity gap between interest sensitive assets and liabilities during the review period (see **Figure 5.21**). However, the ratio of short-term assets (less than three months) to short-term liabilities decreased marginally to a quarterly average of 33.2 per cent from 36.8 per cent for 2016 but exceeded the quarterly average for the two year period spanning 2014-2015 (see **Figure 5.22**).

5.11 Interest rate risk assessment of SDs

During the review period, the securities dealers sector was less susceptible to shocks involving hypothetical increases and decreases in interest rates. Of note, regarding a shock involving a 1100 bps/100 bps & 275 bps/15 bps increase in interest rates on domestic and foreign rate sensitive assets and liabilities, the sector's CAR declined to 9.4 per cent relative to 6.1 per cent at end-2016, following the same shock (see **Figure 5.24**). In addition, subsequent to a shock involving a 100 bps/10 bps & 25 bps/2 bps decrease in interest rates on domestic and foreign rate sensitive assets and liabilities, only two SDs were impacted, with the CARs of both institutions remaining well above the 10.0 per cent benchmark following the shock.

14 To address potential systemic risks from the retail repo business model, the GOJ committed to reform the securities industry, which included the phasedown of the "retail repo" business model.

Figure 5.24 Interest rate stress test results - SDs¹⁵

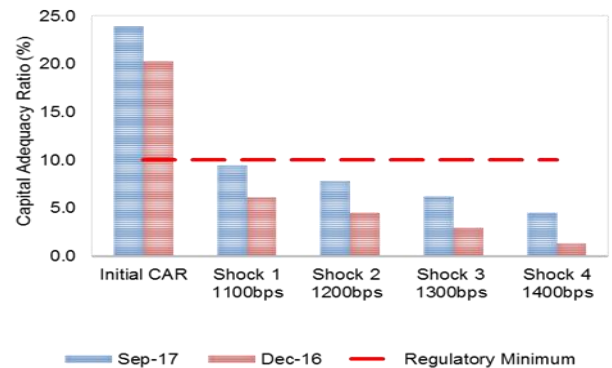


Figure 5.25 Evolution of duration for domestic and foreign securities for securities dealers

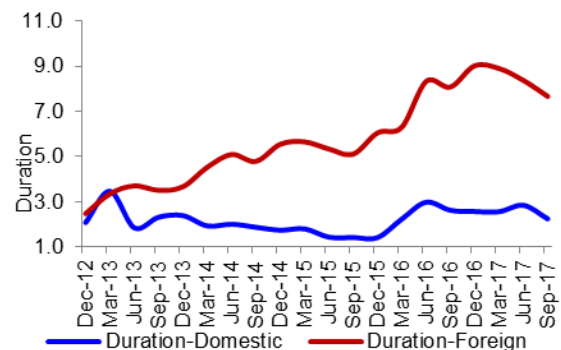
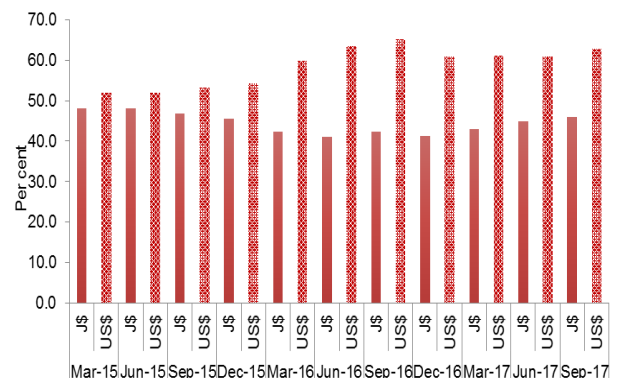


Figure 5.26 Investment holdings as a ratio to total investments - SDs



15 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 2016¹⁶

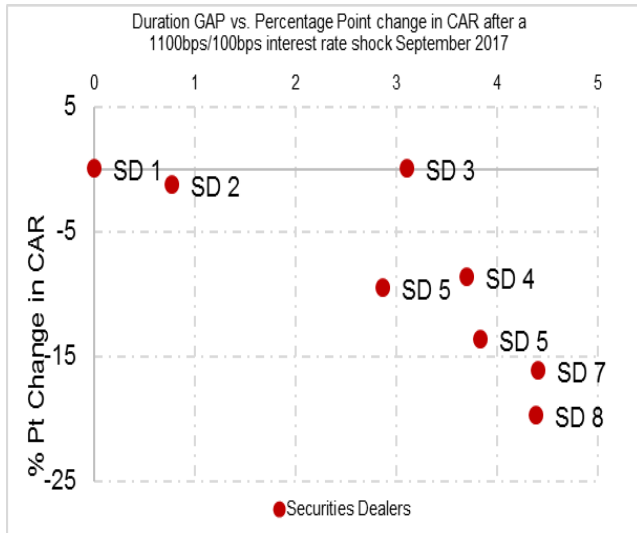
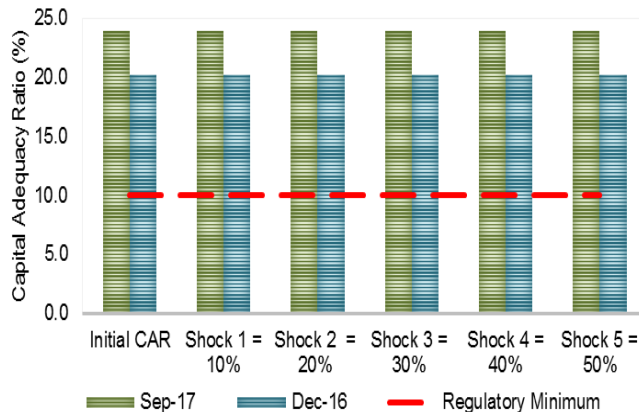


Figure 5.28 Foreign exchange risk stress test results - SDs (Scenarios: Impact on CAR of 10.0 per cent to 50.0 per cent depreciation)



¹⁶ The analysis was only done for eight of the 12 SDs typically examined as some entities have minimal securities holdings.

The stronger performance of the SDs during 2017 was reflective of higher levels of capitalization relative to end-2016. In addition, moderation in duration levels, particularly on the foreign currency investment portfolio, contributed to lower fair value losses despite the continued strong levels of foreign currency dollarization on the SDs’ investment portfolio (see **Figure 5.26**).

Nonetheless, however, a scatter plot of the core nine SDs’ duration against their percentage point change in CAR following the abovementioned hypothetical interest rate shock showed that SDs remained susceptible to interest rate risk due to the continued large gap between the duration on the asset and liability portfolio at end-September 2017.

5.12 Foreign exchange risk assessment of SDs

The SDs’ sector remained resilient to hypothetical exchange rate shocks despite continued increases in the net open position of these institutions during the review period.¹⁷ More specifically, these institutions were resilient to a 10.0 per cent to 50.0 per cent range of shocks involving both hypothetical depreciations and appreciations in the exchange rate, nonetheless, the sector also reflected an increased susceptibility to appreciation shocks (see **Figure 5.28**). Of note, following a 50.0 per cent appreciation in the exchange rate, the CAR for the SD sector declined by 6.3 percentage points to 17.6 per cent relative to a decline of 2.4 percentage points to a post-shock CAR of 17.8 at end-2016 following the same shock. Notwithstanding, the sector’s CAR continued to remain above the 10.0 per cent benchmark and continues to be supported by the strong levels of capital of these institutions (see **Chapter 2**).

¹⁷ The NOP to capital ratio for the SDs increased to 20.9 per cent at end-September 2017 relative to 18.7 per cent at end-2016.

5.13 Evolution of risk indicators – Life and General Insurance Companies

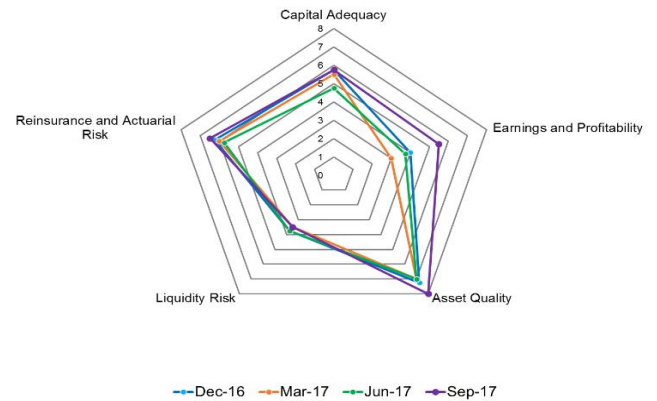
The cobweb map of risk exposures for the GI companies showed that there was deterioration in the asset quality, capital adequacy and earnings and profitability dimensions of risk at end-September 2017 relative to end-2016 (see **Figure 5.29**). The performance of the asset quality dimension was largely influenced by the increases in the equities to total assets and receivables to gross premiums ratios while the worsening in the earnings and profitability dimension largely reflected the impact of weakening in net claims as a share of net premiums earned and total expenses as a proportion of net premiums written. Furthermore, the capital adequacy dimension reflected deterioration in the capital to assets ratio. Nonetheless, there was improvement in liquidity risk dimension which was largely influenced by increases in the liquid assets to total assets ratio.

As it relates to the life insurance sector, there was deterioration across reinsurance and actuarial issues and earnings and profitability dimensions for the review period while the performance across the other dimensions was unchanged (see **Figure 5.30**).

5.14 Market and interest rate risk assessment of Insurance Companies

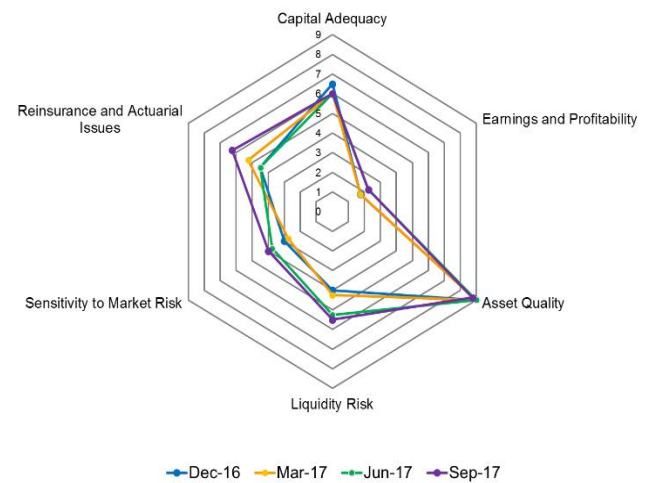
Life insurance and general insurance companies showed increased resilience to hypothetical interest rate shocks at end-September 2017 relative to the close of 2016. The performance of each sub-sector reflected strong levels of capitalization as well as lower net interest income losses for the life insurance sub-sector relative to end-2016 (see **Figure 5.31**). Furthermore, following the most severe shock which was applied, involving a 1400 bps/400 bps & 350 bps/70

Figure 5.29 Evolution of Risk Exposures – General Insurance



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 + accs 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 5.30 Evolution of Risk Exposures – Life Insurance



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

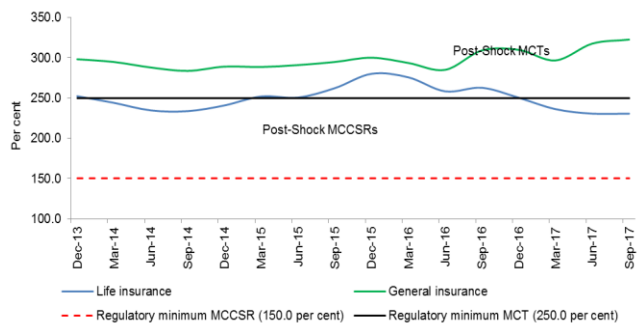


Figure 5.32 Interest rate risk stress tests for the life insurance sector¹⁸

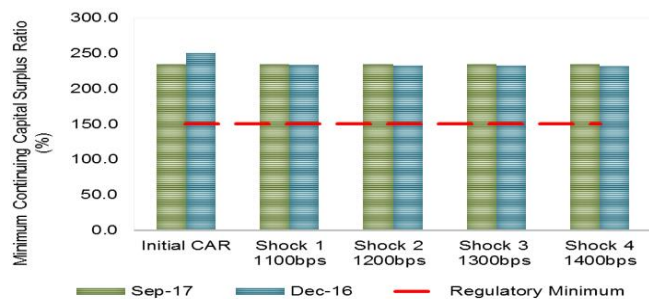
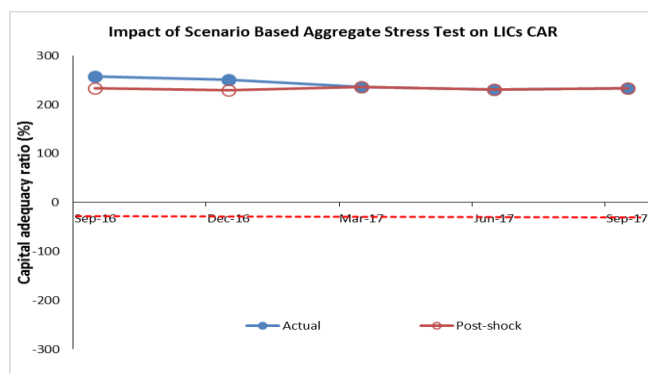


Figure 5.33 Impact of Scenario based aggregate stress tests on LICs' CARs



¹⁸ 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. Life and general insurance companies were also resilient to shocks involving 100 bps/10 bps & 25 bps/2 bps decrease in interest rates on domestic and foreign rate sensitive assets and liabilities.

increase in interest rates, the capital ratios for both sub sectors remained unchanged. In addition, the post-shock CARs of all institutions, except one life insurance company, remained above the statutory benchmark following the hypothetical interest rate shock (see **Figure 5.32**).

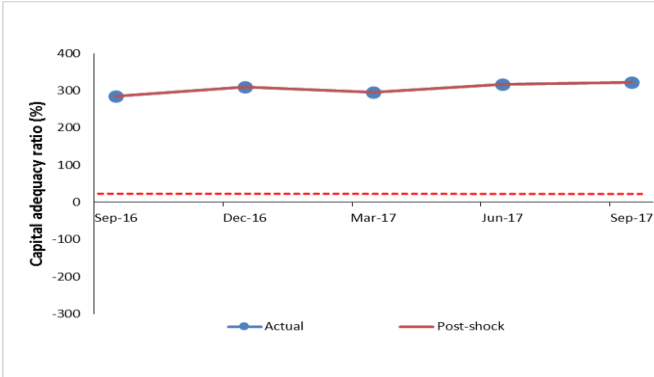
5.15 Liquidity funding risk assessment of ICs

The life and general insurance sectors showed continued robustness to hypothetical shocks involving declines in liquid liabilities partly as a result of further increases in liquid asset holdings during 2017.

With regards to life insurance companies, the (MCCSRs) of the sub-sector decreased to a quarterly average of 232.5 per cent for the first three quarters of 2017 relative to an average of 261.7 per cent for 2016, following a hypothetical shock involving a 10.0 per cent loss of liquid liabilities (see **Figure 5.31**). Nonetheless, the post-shock MCCSR was well above the prudential minimum for all institutions in the sub-sector. In addition, the quarterly average post-shock MCT for general insurance companies was 312.2 per cent for the same period in 2017 relative to a lower quarterly average of 299.3 per cent for 2016. The improved performance relative to 2016 was also driven by increases in the capital position of these institutions over the review period.

Furthermore, aggregate stress test results for the life and general insurance companies showed that the post-shock capital ratios for both sub-sectors remained above the prescribed statutory benchmark (see **Figures 5.33 & 5.34**). Notwithstanding, the general insurance and life insurance sub-sectors were largely impacted by hypothetical shocks involving a 10 per cent loss in liquid liabilities.

Figure 5.34 Impact of Scenario based aggregate stress tests on GICs' CARs



Box 5.1 Update on Balance Sheet Risks of Securities Dealers

Background

Firms within the securities dealers sector have historically demonstrated a business model involving a high level of balance sheet intermediation, primarily from using short term obligations, mainly repurchase agreements (repos) with clients, to finance their inventory of long-term securities. Since these repo liabilities are deposit like in nature, such a model exposes these dealers to liquidity risks through excessive funding withdrawal prior to the maturity of the contracts or upon contract maturity. In addition, this business model has created a significant balance sheet mismatch of maturities which has resulted in a large exposure to interest rate risk.

Given the significance of the size of the securities dealers sector within the Jamaican financial system and the wide-spread industry use of such a bank-type business model, prudential tightening of the sector was warranted. Such prudential tightening included, but was not limited to, an introduction of a liquidity management requirement, the transition of the retail repo market to a trust-based arrangement and the establishment of a minimum transaction size for retail repo clients. The transition to the trust was accomplished at end-August 2015 and a minimum investment amount for retail repo clients was fully implemented at end-December 2015.

Securities Dealers' Disintermediation

The reduction in systemic risks necessitated the moving of clients' funds off the balance sheet of securities dealers. There has been a steady increase in the share of clients' funds managed off the balance sheet of securities dealers when compared to total funds under management (see **Table 1**).¹ Similarly, regarding retail repos specifically, the use of retail repo as a form of funds under management is declining over time (see **Table 2**).²

Securities Dealers' Balance Sheet Risks

Despite the growth in client funds managed off balance sheet, securities dealers' balance sheets continue to reflect the pre-existing bank-like structure in the use of short-term funds to finance their inventory of long-dated securities. Stress tests of securities dealers' resilience to interest rate and liquidity risks over time are presented in Tables 3 & 4. The results show that there has been no substantial change in their risk exposures.

¹ Repo liabilities include retail and classic repurchase agreements. On-balance sheet FUM is repo liabilities + client funds not under repurchase agreements. Total FUM is off-balance sheet FUM plus On-balance sheet FUM

Table 1. Disintermediation of client funds: Top 12 securities dealers

J\$ Billions	Sept. 2014	Sept. 2015	Sept. 2016	Sept. 2017
Repo Liabilities	\$400.9	\$377.2	\$365.6	\$382.9
Client funds not under repo agreement	\$12.9	\$19.2	\$52.2	\$36.8
Off-Balance Sheet FUM	\$280.5	\$367.7	\$546.3	\$637.2
Off-balance sheet FUM to On-balance sheet FUM	67.8%	92.7%	130.8%	151.8%
Off-balance sheet FUM as a share of Total FUM	40.4%	48.1%	56.7%	60.3%

Table 2. Retail repo disintermediation

J\$ Billions	Sept. 2015	Sept. 2016	Sept. 2017
Total Retail Repos	\$215.1	\$199.9	\$203.1
Total Classic Repos	\$177.4	\$180.7	\$198.7
Client funds not under repo agreement	\$20.1	\$53.1	\$37.6
Off-Balance Sheet FUM of retail repo dealers	\$320.8	\$430	\$572
Retail repo to On-balance sheet FUM	52.1%	46.1%	46.2%
Retail repo as a share of Total FUM	29.3%	23.2%	20.1%
# of dealers	14	13	13

Table 3. Stress test results from interest rate shock of 1100 bps/100 bps & 275 bps/15 bps on domestic/foreign assets & liabilities

	Sept. 2014	Sept. 2015	Sept. 2016	Sept. 2017
# of institutions falling below CAR of 10%	7	5	6	7
Fair Value loss (J\$ Bn)	\$22.7	\$16.6	\$31.2	\$31.5
Fair Value Loss as a share of Total Assets	4.55%	3.44%	5.97%	5.82%

² Retail repos refer only to repurchase agreements that do not completely and outrightly transfer the legal ownership of the underlying securities from the dealer to the client.

Table 4. Stress test results from a 50% reduction of repo liabilities

	Sept. 2014	Sept. 2015	Sept. 2016	Sept. 2017
# of institutions falling below CAR of 10%	4	3	3	4
Haircut loss due to liquidation of assets (J\$ Bn)	\$36.5	\$32.6	\$28.8	\$30.3
Haircut loss as a share of Total Assets	7.32%	6.74%	5.51%	5.61%

FSC's Action Plans

The FSC in 2016 issued Guidelines to the Securities (Prudential) Regulations, 2014 which outlined the principles and practical guidance for sound liquidity management that each securities dealer is expected to adopt. In addition, the FSC has developed an implementation plan for prudential ratios aimed at monitoring and reducing the interest rate and liquidity risk exposures of securities dealers.

Retail Repo Mismatch Ratio

In recognition of the need for a prudential ratio for interest rate risk, a joint working group of the FSC and the BOJ commenced working on its development in March 2017. With assistance provided by a short-term expert contracted by the IMF, the Retail Repo Mismatch Ratio was identified as the best indicator to control the exposure of a dealer's capital to the risks inherent in their retail repo portfolio.

The ratio takes the difference between the average duration of securities underlying the retail repo contracts and the average duration of retail repo liabilities, and weights this gap by the size of retail repo liabilities relative to regulatory capital. The retail repo mismatch ratio will be introduced as an early warning indicator in 2018 with full implementation scheduled for end-December 2020.

Volatile Funding Sources Coverage Ratio (VFSCR)

Regarding the need to develop liquidity prudential ratios that are deemed fit to measure a securities dealer's ability to meet its short term financial obligations on time, a study was conducted by the FSC to determine an appropriate definition of liquid assets and appropriate liquidity ratios. Based on the outcome of the study, the FSC is considering the VFSCR as a liquidity ratio for prudential monitoring. The ratio is measured as *liquid assets that will not mature within the next 90 days + formalised Overdraft Facilities / (Volatile funding sources*

likely to be called within 90 days + Other Liabilities) - Liquid assets maturing within 90 days.

The VSCFR measures the coverage that liquid assets maturing after ninety days provide against the mismatch of the (90) day maturity bucket. This measure will require that securities dealers have enough liquid assets and a formalised overdraft facility with a commercial bank to cover potential cash outflows in a 90-day volatile or stressful period.

The FSC is considering an implementation period of five years. It includes a 2-year monitoring period to allow SDs to assess the impact of the proposed benchmarks. Subsequent to which a gradual prudential requirement would proceed as follows:

- Year 1 – 50.0 per cent
- Year 2 – 75.0 per cent
- Year 3 – 100 per cent

6. Payment System Developments

6.1 Overview

The payment and settlement system demonstrated growth in activity reflecting buoyant domestic liquidity conditions and expansion in financial activity. This was reflected by increases in payment activity conducted via the JamClear-RTGS and JamClear-CSD. Notwithstanding, increases in electronic payments, currency in circulation showed an equivalent increase but the use of cheque transactions continued to decline for the review period.

In relation to the financial sector’s exposure to financial market infrastructure, there was a continued susceptibility to concentration risk, emanating from concentration of liquidity in the large-value transfer system as the majority of payment activity remained concentrated in the two largest participants.

Regarding interconnectedness and systemic importance, commercial banks significantly influenced the flow of liquidity within the network. Network characteristics remained largely unchanged over the year with moderate demonstration of increased connectivity in payment system activity.

Figure 6.1 JamClear systems monthly turnover

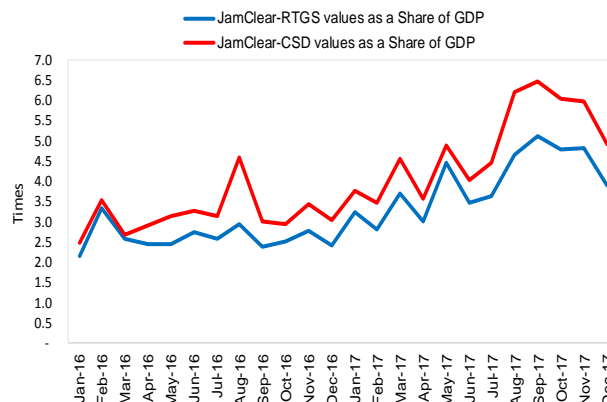


Figure 6.2 JamClear-RTGS monthly transaction values and volumes

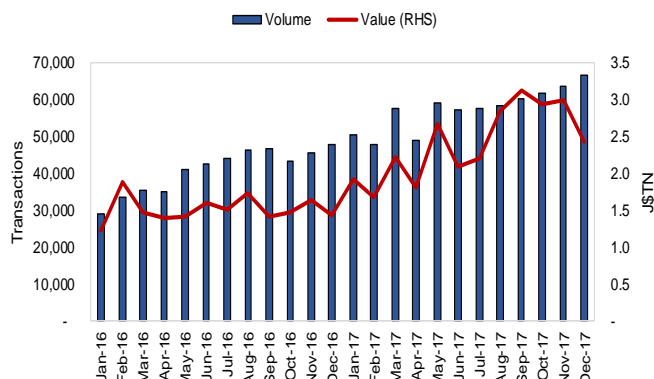


Figure 6.3 JamClear-CSD monthly transaction values and volumes

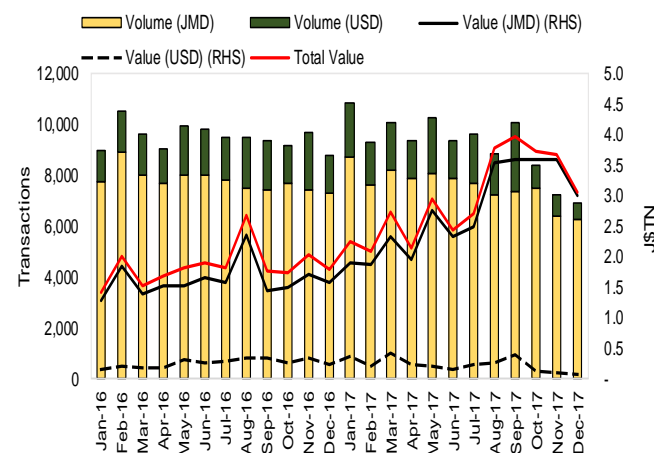
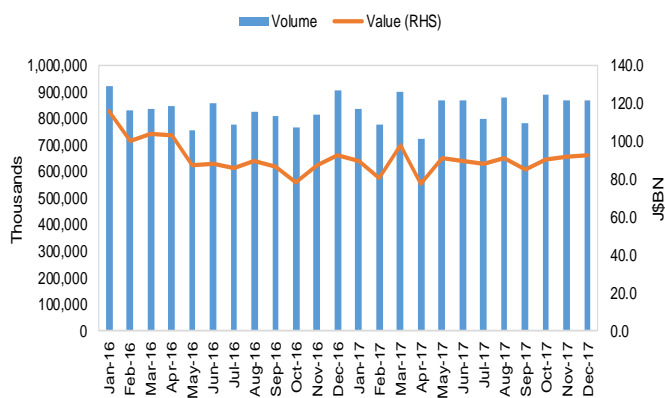
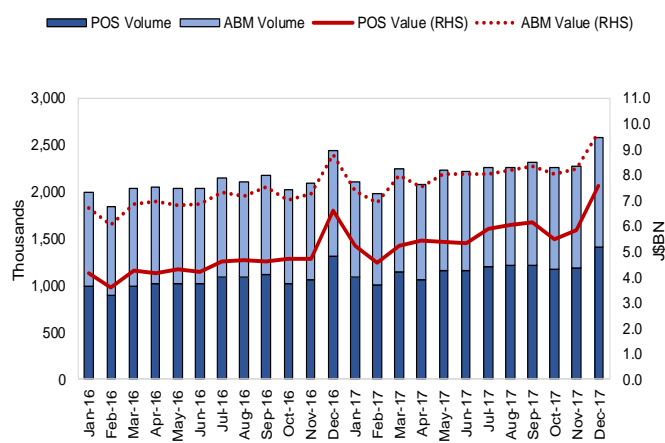


Figure 6.4 Automated Clearing House monthly transaction values and volumes**Figure 6.5** MultiLink monthly transaction values and volumes**Table 6.1** Percentage proportion of average monthly retail payment transactions

	2016		2017	
	Value	Volume	Value	Volume
Cheques	58.1	12.5	52.5	11.4
Card Payments				
<i>Debit</i>	27.0	69.4	29.9	69.0
<i>Credit</i>	11.1	16	12.9	17.4
Other Electronic Payments	3.8	2.1	4.8	2.2

¹ JamClear-RTGS statistics include both JMD and USD denominated transactions and excludes general ledger and billing transactions.

² The JamClear-RTGS system consists of 22 full members: eight commercial banks, one building society, one merchant bank, nine primary dealers (broker dealers), the Jamaica Central Securities Depository (Trustee), Accountant General Department (AGD) and Bank of Jamaica (BOJ).

6.2 Key developments in Payment Systems

6.2.1 JamClear-Real-Time Gross Settlement (RTGS) System^{1,2}

Activity within the JamClear-RTGS system continued to increase during 2017. This was reflected in the total value of transactions increasing by 60.0 per cent to \$28.8 trillion for 2017 and a system turnover of 15.6 times GDP. The average monthly transaction value also increased to \$2.4 trillion for 2017 relative to J\$1.5 trillion for 2016. This transactional value represented an average monthly turnover of 2.8 times monthly GDP (see **Figure 6.1**).³ Payments related to securities transactions from the JamClear-CSD accounted for approximately 70.0 per cent of the total transaction value of the JamClear RTGS system.

Similarly, total volume of JamClear-RTGS transactions for the period increased to 687,864 for 2017 relative to 488,678 for 2016, reflecting a 47.0 per cent increase. Additionally, the average monthly transaction volume increased by 40.8 per cent to 57,322 transactions (see **Figure 6.2**).⁴ Customer credit transfers (single and multiple) accounted for approximately 87.0 per cent of the total transaction volumes.

6.2.2 JamClear- CSD⁵

For 2017, the JamClear CSD reflected an increase in transaction values while transaction volumes decreased relative to the previous review period. The overall transactional value increased by 60.7 per cent to \$35.4 trillion in 2017 which represented a system turnover of 19.1 times GDP. The average monthly value of JamClear-CSD transactions increased to \$2.9 trillion for 2017 relative to \$1.8 trillion for 2016, an average monthly turnover of 4.9 times monthly GDP (see **Figure 6.1**). On the other hand, the overall volume of transactions declined to 110,021 for 2017 relative to 113,597 transactions for 2016. Correspondingly, the average monthly volume of transactions also decreased by 3.1 per cent to 9,168 transactions for 2017 (see **Figure 6.3**).

³ Turnover is a ratio of the total transaction value as percentage of GDP.

⁴ Commercial banks faced a charge of \$5,000.0 per transaction greater and equal to the targeted ACH threshold of \$1.0 million.

⁵ JamClear-CSD statistics include both JMD and USD denominated transactions.

6.2.3 Retail Payment Systems

Development in Commercial bank sector

Automated Clearing House (ACH)

With the lowering of the ACH threshold to \$1.0 million, activities within the ACH showed mixed performance over the review period. The overall value of transactions for 2017 decreased to \$1.0 trillion relative to \$1.1 trillion for 2016. Within the total ACH transaction value for 2017, cheques processed accounted for \$812.5 billion, a decrease of 6.8 per cent relative to 2016. The average monthly value of cheques processed also decreased to \$129 537 per transaction relative to \$134 590 per transaction in 2016. This performance reflected the Bank’s continued efforts to minimize net settlement risks emanating from the ACH. The average monthly transaction value also decreased to \$88.5 billion for the review period relative to \$93.0 billion for 2016.

Conversely, total volume of cheque transactions increased to 10.0 million for 2017 relative to 9.7 million for 2016. This was primarily due to increases in both direct credit and debit transactions by 19.6 per cent and 2.1 per cent, respectively. The number of processed cheques however, decreased by 3.1 per cent. In addition, average monthly transaction volume also increased to 837 274 for the review period relative to 827 454 for 2016 (see **Figure 6.4**).

MultiLink

There continued to be strong usage of electronic means of payments during 2017. Activities within the MultiLink card network increased for 2017. The total value of MultiLink transactions increased by 14.3 per cent to \$174.7 billion. The average monthly transactional value also increased to \$14.6 billion for 2017 relative to \$12.7 billion for 2016. Moreover, overall and average transactional volumes increased to 26.8 million and 2.2 million for 2017, respectively, relative to 25.0 million and 2.1 million transactions for 2016. The increase in average monthly transactional activity was influenced by growth in both point-of-sale (POS) and automated bank machine (ABM) transactions. The average monthly volume of POS transactions increased by 11.3 per cent, amounting to \$6.6 billion while the number of ABM transactions increased by 3.3 per cent to \$8.0 billion (see **Figure 6.5**).

Figure 6.6 Currency in circulation

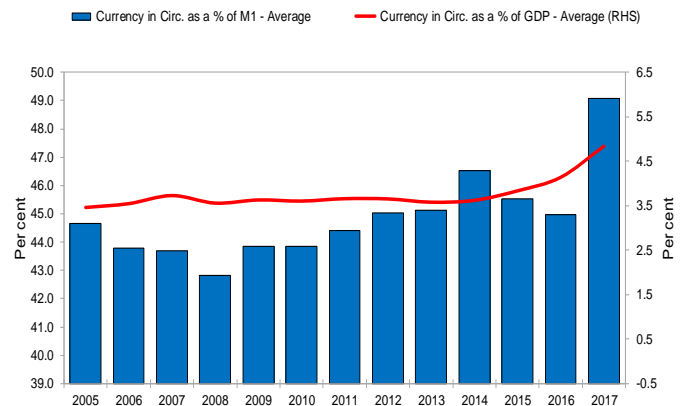


Figure 6.7 Inter-bank and intra-bank cheque volumes and values per 1000 persons

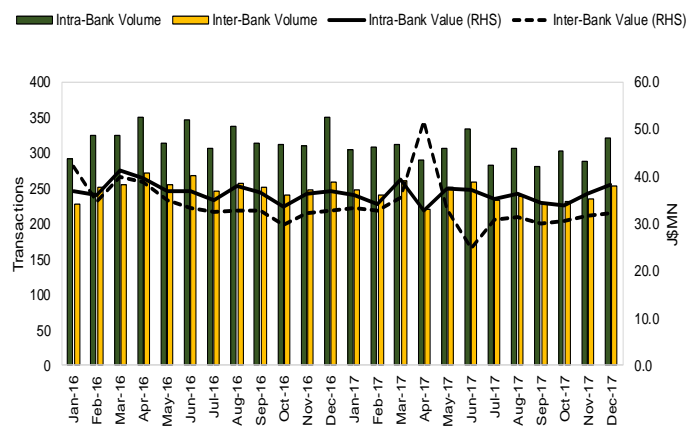


Figure 6.8 E-payment volumes and values per 1000 persons

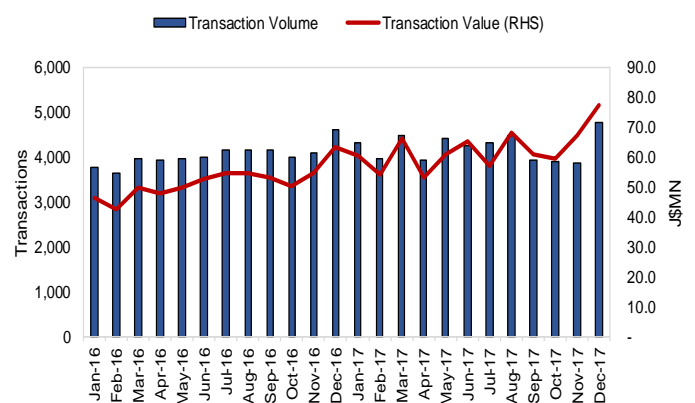


Figure 6.9 Debit & credit card volumes and values per 1000 persons

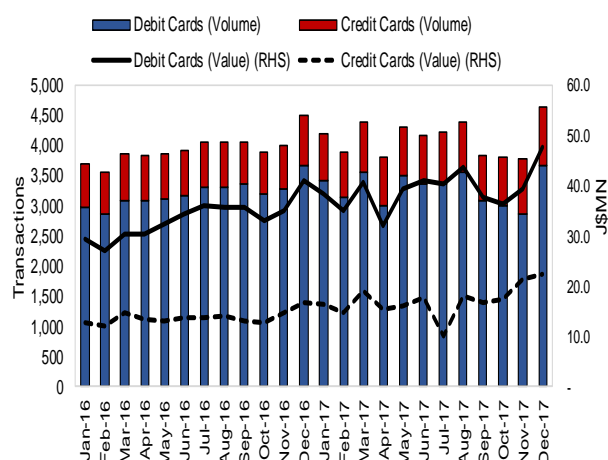


Figure 6.10 Monthly payment card penetration

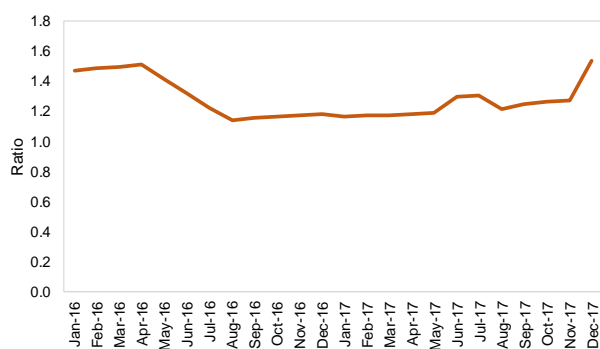
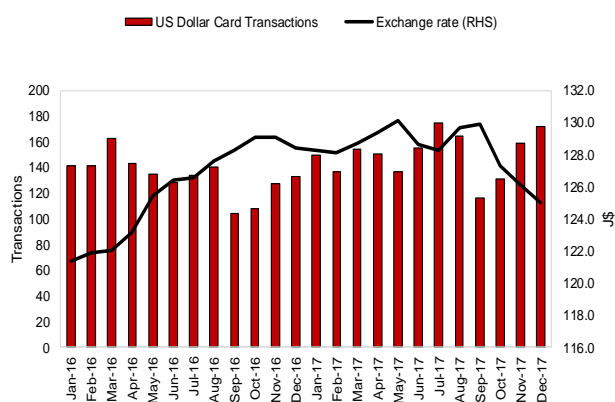


Figure 6.11 US dollar card transaction per 1000 persons and exchange rate



⁶ All retail payments figures except cash data are per 1000 persons of working age (age 14 and older).

6.2.4 Key trends & developments in retail payments⁶

For the review period, total retail payment transaction value increased in 2017 by approximately 6.7 per cent to \$1.6 billion per 1000 persons.⁷ The average monthly transactional value also increased to \$131.4 million per 1000 persons for the period. The total number of retail transactions increased by 3.4 per cent to 57 113 per 1000 persons with average monthly transaction volumes increasing to 4 759 transactions per 1000 persons. Notably, debit cards continued to be the most utilized retail payment instrument in 2017 accounting for 69.0 per cent of the total number of retail payment transactions, although it decreased by 0.4 percentage points. Cheques accounted for 52.5 per cent of the total value of retail transactions for 2017, reflecting continued migration from paper-based means of payments to electronic forms (see **Table 6.1**).

Paper-based Instruments

Cash

Despite the increased usage of electronic means of payment, retail consumers displayed a stronger preference for cash during the review period. Against this background, currency in circulation increased by 23.6 per cent to \$106.8 billion relative to growth of 17.8 per cent for 2016. The average monthly level of currency in circulation as a share of GDP, increased to 4.6 per cent for 2017 relative to 4.2 per cent for 2016. Average currency in circulation as a share of M1 also increased to 49.1 per cent for 2017 relative to 45.0 per cent for 2016 (see **Figure 6.6**).⁸

Cheques

Cheque payments continued to decline in 2017 with the average monthly cheque transactions values decreasing by 3.7 per cent to \$68.9 million per 1000 persons. A further disaggregation of the cheque transactions value revealed that the value of intra-bank cheques decreased by 2.9 per cent to \$35.9 million per 1000 persons with the value of inter-bank transactions decreasing by 4.5 per cent to \$33.1 million per 1000 persons.

⁷ Retail payments include cheque payments, debit and credit card payments and other electronic forms of payment.

⁸ M1 is defined as currency in circulation plus demand deposits in local currency.

Concurrently, average monthly cheque transaction volume decreased by 6.0 per cent to 543 transaction per 1000 persons. Consistent with the change in transactional value, intra-bank cheque volumes declined by 6.3 per cent to 302 transactions per 1000 persons with inter-bank transaction decreasing by 4.0 per cent to 241 transactions per 1000 persons (see **Figure 6.7**).

Electronic payment instruments⁹

The value and usage of electronic payment instruments offered by commercial banks continued to grow during 2017. The value of electronic payments increased to \$750.0 million per 1000 persons reflecting a 21.1 per cent increase, while the average monthly value increased to \$62.5 million per 1000 persons. The total number of electronic transactions for 2017 increased by 4.6 per cent to 50 593 transactions per 1000 persons with average monthly electronic transactions increasing to 4 216 transactions per 1000 persons (see **Figure 6.8**).

Card payments

In 2017, card payment activities processed by commercial banks continued to increase with growth in both credit and debit card transaction values and volumes. The value of credit card transactions reflected an increase of 24.2 per cent valued \$204.0 million per 1000 person with average monthly transactional value increasing to \$17.0 million per 1000 persons for 2017. Debit card transactional values also increased in 2017 by 17.9 per cent to \$471.1 million per 1000 persons with average monthly transactional value increasing to \$39.3 million per 1000 persons. Furthermore, credit card volume increased in 2017 by 12.4 per cent to 9 923 transactions per 1000 persons with average monthly volumes increasing to 827 transactions per 1000 persons. In addition, debit card volumes increased in 2017 by 2.7 per cent to 39 405 transactions per 1000 persons with average monthly volume increasing to 3 284 transactions per 1000 persons (see **Figure 6.9**).

Figure 6.12 Number of active POS and ABM Terminals

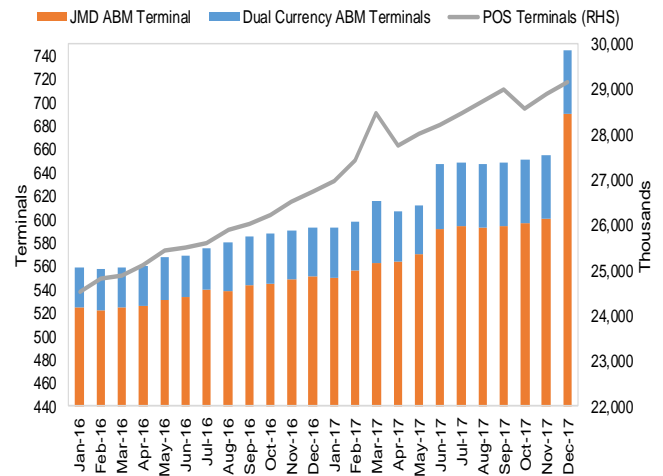


Figure 6.13 POS transactions to ABM withdrawals

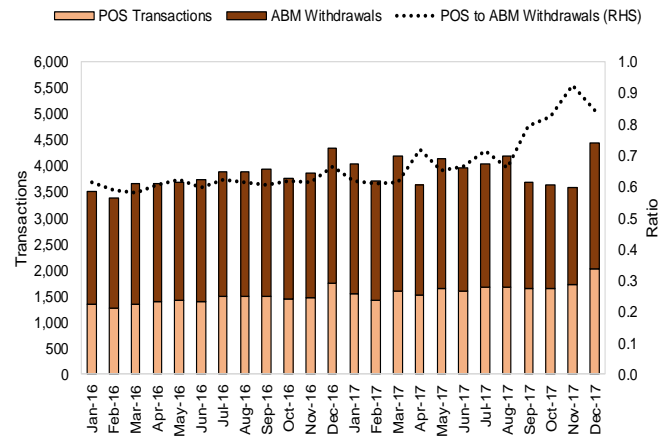
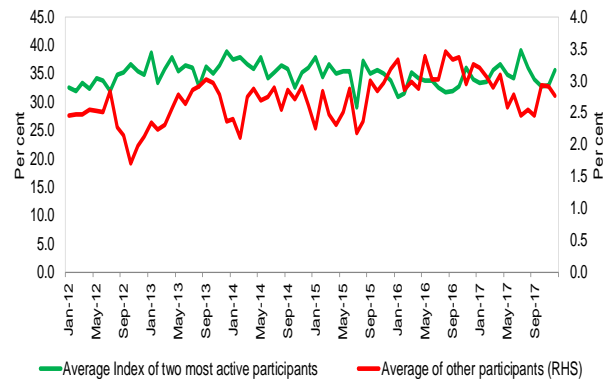


Figure 6.14 Large-value system concentration risk index



⁹Electronic payments include debit card, credit card and other electronic payments.

Figure 6.15 Herfindahl index of JamClear-RTGS payment activity

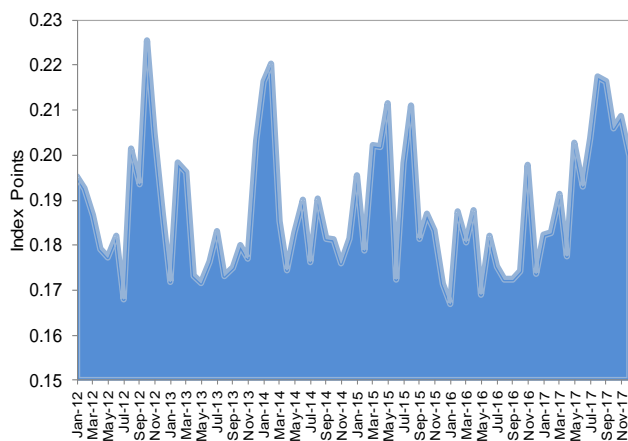


Figure 6.16 BOJ intraday repo facility monthly transaction value

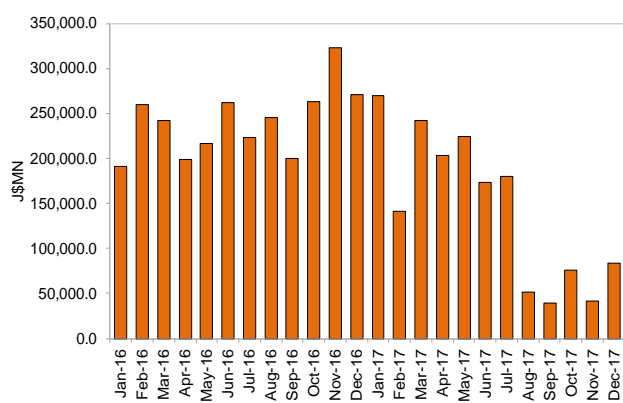
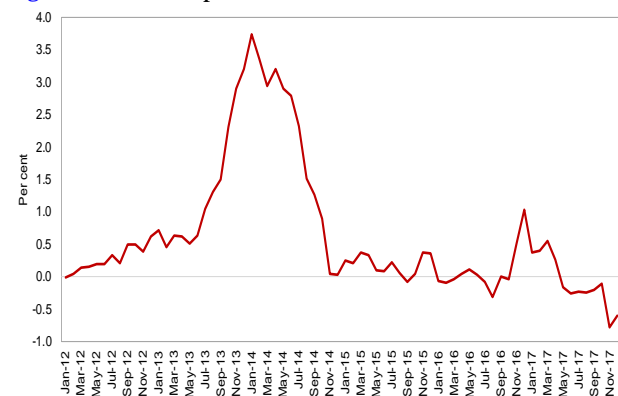


Figure 6.17 TRE Spread



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 rate and the 30-day T-bill rate.

Though card activities increased over the review period, average monthly payment cards in circulation decreased by 4.3 per cent to 2.6 million in 2017. Subsequently, average monthly card penetration decreased to 1.2 cards per person for 2017 relative to 1.3 cards per person in 2016 (see **Figure 6.10**).¹⁰

The average monthly volume of US dollar card transactions continued to grow in 2017 mainly due to the appreciation of the Jamaican dollar vis-à-vis US dollar. Average monthly volume of US dollar card transactions increased by 12.8 per cent to 150 transactions per 1000 persons (see **Figure 6.11**). The volume of Jamaica dollar-denominated card transactions also increased relative to 2016.

Electronic payment channels offered by commercial banks

There was an increase in the number of active ABM and POS terminals operated by commercial banks. Specifically, ABM active terminals increased by 25.2 per cent at end-2017 to 690 terminals. The number of active POS terminals also increased by 9.0 per cent at end-2017 to 29 147 terminals (see **Figure 6.12**).

In light of the continued increase in electronic payment usage, the ratio of POS transactions to ABM withdrawals also increased in 2017. Though the number of ABM withdrawals continued to be greater than the number POS transactions, growth in the average monthly number of POS transactions for 2017 surpassed that of ABMs withdrawals, increasing by 14.1 per cent to 1 633 transactions per 1000 persons. Average monthly ABM withdrawals declined by 1.9 per cent to 2 296 transaction per 1000 persons. In the context of growth in average monthly POS transactions to ABM withdrawals, the ratio of POS transactions to ABM withdrawals increased to 0.7 POS transactions for every ABM withdrawal relative to 0.6 in 2016 (more than one ABM withdrawal to a POS transaction). This outturn reflects the continued preference of cash for transactional purposes despite the increasing usage of electronic payments (see **Figure 6.13**).

¹⁰ Cards penetration is total credit and debit cards (JMD, USD and dual currency) to the working population (14 years and older)

6.3 Assessing financial sector exposure to financial market infrastructures (FMIs)

6.3.1 Concentration Risk

Large-value System Concentration Risk Index (LSCRI)¹¹

Liquidity concentration as measured by LSCRI showed that liquidity remained high for the review period.¹² Of note, the share of payment activity continued to be dominated by the two most active participants while there was a decrease in the share of activity for other participants. The average share of payment activity for the two most active participants increased to 35.7 per cent for 2017 relative to 34.0 per cent for 2016. Additionally, there was a decline in the average share of activity for other participants within the system to 2.8 per cent in 2017 relative to 3.3 per cent in 2016 (see **Figure 6.14**).

Herfindahl Index of JamClear-RTGS Liquidity Concentration

The moderate level of concentration risk within the large value payment system was also reflected in the Herfindahl index of payment activity.¹³ This index averaged 0.2, in line with the annual average over the last five years, thereby signalling persistence in the level of liquidity concentration within the large value transfer system in Jamaica (see **Figure 6.15**).

6.3.2 Liquidity risk

Usage of BOJ's intraday liquidity facility¹⁴

Liquidity conditions improved during 2017 relative to the previous year. Specifically, the average monthly and overall value of BOJ's intraday liquidity facility usage declined to \$144.0 billion and \$1.7 trillion, respectively in 2017 from \$241.7 billion and \$2.9 trillion for 2016 (see **Figure 6.16**).¹⁵

¹¹ This measure is computed based on payments made and received by each bank as a share of overall payments for the system.

¹² The LSCRI records the share of payment activity between:

- (1) the two most active participants in relation to all other participants and;
- (2) all other participants in relation to the two most active participants.

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

¹³ The Herfindahl index is a measure of the extent of a financial institution's payment activity in relation to the other participants in the system. It is also an indicator of the level of concentration of liquidity with the system.

¹⁴ 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.

Figure 6.18 Share of BOJ intraday repos (values) demanded by the top four subscribers during 2016 & 2017

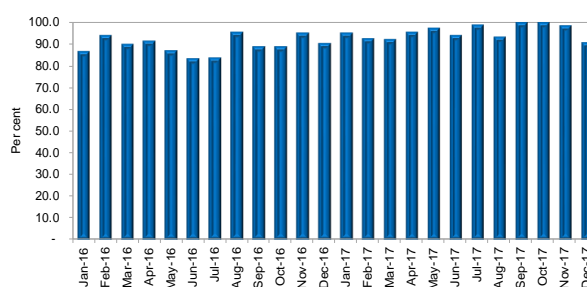


Figure 6.19 JamClear-RTGS network (end-September 2017)

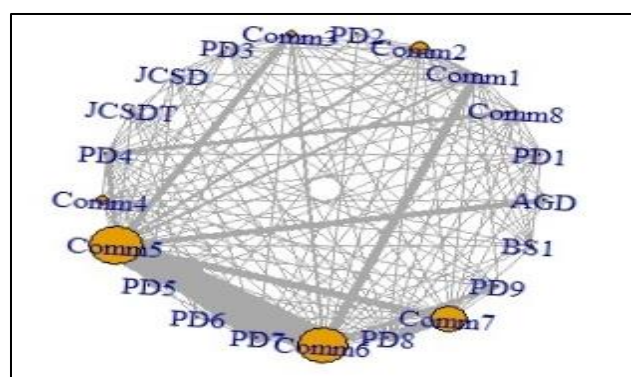


Table 6.2 Core payment network statistics

	Dec 2016	Dec 2017
Number of Links	272	263
Density (%) - Connectivity	64.7	62.6
Average Path Length ¹⁶	1.4	1.4
Diameter ¹⁷	7	4
Size of Giant Strongly Connected Components (GSCC) - Number of Institutions	12	12

¹⁵ During 2017, the bank provided the standing liquidity facility (SLF), the 14-day repurchase operations and the excess funds rate (EFR). The Bank also eased liquidity by applying higher placements on the Bank's overnight Certificate of Deposit (CD).

¹⁶ 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.

¹⁷ 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.

Correspondingly, the number of the intra-day liquidity transactions, also decreased by 34.8 per cent in 2017 comparison to 2016. Improved liquidity conditions were also observed in the money market during the review period as reflected by a narrowing of the TRE spread (see **Figure 6.17**). Notwithstanding the improved liquidity conditions, of the participating institutions utilizing the BOJ intraday repo facility, the percentage of funds demanded by four institutions remained consistently over 90.0 per cent for most of the review period, an indication of concentration of liquidity risks in the payment system (see **Figure 6.18**).

6.4 Evaluating interconnectedness & systemic importance

JamClear-RTGS network topology

The commercial banking sector remained the most influential sector within the network as reflected by the larger nodes. Commercial banks also significantly influence the flow of liquidity within the network, evidenced by the thicker links (see **Figure 6.19**). Notwithstanding, building societies and primary dealers continued to show a high level of importance within the payment network.

Network connectivity decreased slightly to 62.6 per cent at end-2017 relative to 64.7 per cent at end-2016. This decline reflected continued lower potential contagion paths within the system. In addition, there was an increase in the speed of contagion measure where the “diameter” decreased to 4 participants at end-2017 relative to 7 participants at end-2016. This result reflects relatively higher susceptibility of the JamClear-RTGS to systemic risk brought on by participants experiencing liquidity constraints (see **Table 6.2**).

Box 6.1 E-Money Activity in Jamaica

E-money can be defined as “electronically, including magnetically, stored monetary value in any device or instrument or server as represented by a claim on the issuer, which is issued one receipt of funds for the purpose of making payment transactions and which is accepted as a means of payment by persons other than the issuer”.¹ It can be stored in multiple types of devices such as payment cards, servers, web-based platforms or a mobile phone. Such innovation can potentially broaden the financial system by facilitating expanded financial inclusion.

Mobile money services refer more specifically to those financial services delivered across a mobile phone. It can include mobile money transfer, mobile banking and mobile payments.

- *Mobile Banking* facilitates banking activity such as account deposits, withdrawals and transfers, and caters only to persons who operate a formal bank account.
- *Mobile Payments* allows banked and unbanked persons to buy and sell merchandise or make other types of business payments via a mobile phone.

Potential Impact of E-Money on the Financial System

1. *Expand Financial Inclusion:* By increasing financial access and promoting financial inclusion, mobile banking can increase the level of domestic savings. The mobilization of this additional savings could then allow for the creation of new credit or other forms of the capital supply.
2. *A Reduction in Economic Costs:* The ability to bank conveniently from home or any other location, reduces distance and transaction costs for users. Similarly, delivering financial services over mobile devices can reduce overhead costs since mobile money services are often carried out through highly automated systems.
3. *Creation of Additional Risk:* E-money changes the composition of the financial system through modifications to the types of transactions conducted, types of clients served and the types of services offered. Such changes will create new potential risk exposures to the system. More broadly, e-money could potentially encompass a form of “*disruptive innovation*” that displaces traditional banks while creating new financial markets.

E-Money Activity

As at December 2017, the authorized Electronic Retail Payment Service Providers (ERSPs) were National Commercial Bank Jamaica Limited (NCB Quisk mobile money), GraceKennedy Payment Services (GK Mpay mobile wallet) and Alliance Payment Services Limited (ePay card product). A summary of ERPS activity is provided in the table below.

ERPS Activity	1st Quarter 2017	2nd Quarter 2017	3rd Quarter 2017
Total accounts opened	56,852	43,823	43,585
Total active accounts	13,432	13,310	13,448
Total transaction volume	17,561	564,739	471,879
Total transaction value (JMD)	\$216.3 Mn	\$216.2 Mn	\$209.0 Mn
Average transaction value (JMD)	\$12,621	\$383	\$443
Total e-money value (JMD)	\$10.3 Mn	\$18.2 Mn	\$19.2 Mn

Supervisory Framework

The supervisory framework for ERSPs is governed by BOJ’s Guidelines for Electronic Retail Payment Services. This framework includes, among other things, a description of:

- a) the type of entities that can own & operate a mobile money service;
- b) the type of entities that can provide various related services;
- c) the connection required to the existing banking system;
- d) how ‘Know Your Customer’ and Anti-Money Laundering rules must be implemented;
- e) the legal basis and limitations on mobile money operators; and
- f) capital and liquidity requirements for service providers.

Summary

E-money reflects rapidly evolving financial technology which has implications for risk in the financial system. Challenges for risk surveillance will include concerns associated with money laundering, financial crime and risks to transaction security. However, innovations in financial technology (such as the growth in e-money) create potential net benefits once these challenges are managed.

¹Source:
http://www.boj.org.jm/uploads/news/guidelines_for_electronic_retail_payments_services_-_1_february_2013.pdf

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 their 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	Dollarization is the official or unofficial use of another country's currency as legal tender for conducting transactions.
Financial Intermediation	The process of channelling 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 percent 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.



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