A Systemic Risk Buffer for Jamaica

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Glossary

Term	*Definition*
Basel capital framework	The internationally agreed capital framework for banks developed by the Basel Committee on Banking Supervision.
BCBS	The Basel Committee on Banking Supervision
Common Equity Tier 1 (CET1) capital	The highest quality of regulatory capital as it can be used to absorb losses as and when they occur. It is the sum of common shares and stock surplus, retained earnings, other comprehensive income, qualifying minority interest and regulatory adjustments.
D-SIFI	Domestic Systemically Important Financial Institution
FPC	Financial Policy Committee
FSSC	Financial System Stability Committee
Funds Under Management/ Managed Funds	Transactions involving the provision by customers of cash, securities, financial instruments or contracts to a Securities Dealer for the purpose of investing/dealing in investments or other assets in a manner as may be agreed between the parties; or in a pool of investments or any variation or combination of these.
Higher Loss Absorbency Requirement	An additional capital requirement, above the regulatory minimum.
Systemic Risk	Systemic risk is the possibility that an event that affects an institution could trigger instability or cause the collapse of an entire industry or economy.

1. Summary

This consultation paper outlines for comments the framework for a capital risk buffer/surcharge for domestic systemically important financial institutions (D-SIFIs) in Jamaica. The 2008/2009 global financial crisis as well as Jamaica's financial crisis in the late 1990s highlighted that economic activity can be impaired when large, highly connected financial institutions become distressed. The Basel Committee on Banking Supervision (BCBS) has since highlighted that the introduction of special buffers is an important consideration for global and domestic systemic banks to increase their loss absorbency, given the potential adverse impact on the economy and the broader financial system of the failure of these entities.

The systemic risk buffer (SyRB), which forms part of Bank of Jamaica's macro-prudential tools, will increase the capacity of systemically important deposit-taking institutions (DTI) and securities dealers (SD) to cope with adverse outcomes. The designation of an institution as a D-SIFI and the requirement for the institution to hold this additional capital does not mean that it is inherently risky or is likely to fail; it is meant for the entity to acquire more insurance to *ensure* that it does not fail.

The SyRB rates will range between 0 and 2.5 per cent of institutions' risk-weighted assets (RWAs). All institutions will be allowed to phase in their buffer requirements, based on a predefined schedule. The D-SIFI classifications as well as the applicable SyRB rate will be reviewed annually. The framework will be updated and expanded to address Domestic Systemically Important Groups and other financial groups after the supervisory framework in Jamaica becomes more developed and after the Bank receives the relevant data to make an informed determination.

The designated D-SIFIs for Jamaica and the capital surcharge associated with their status will be published after the consultation period.

This paper (i) outlines the criteria for assessing systemic importance and (ii) develops a quantitative measure that summarises these criteria. The paper also describes some of the key processes involved in the implementation and review of the D-SIFI capital surcharge.

2. Context

Financial institutions need to be able to absorb losses without causing disruptions to the critical financial services that they provide to the economy. The failure of an institution can lead to restrictions on the supply of credit, which can deepen a recession or hamper economic recovery. The impact of such failures is heightened for D-SIFIs due to their size and importance.

2.1 International Context

Following the global financial crisis, the BCBS adopted a series of reforms to improve the resilience of banks and financial systems. These reforms included improving risk coverage, introducing capital

conservation and countercyclical capital buffers and a global standard for liquidity risk. However, these policy measures were not deemed sufficient to address the negative externalities posed by global systemically important banks (G-SIBs). Additional requirements were applied to G-SIBs that were intended to limit the impact of their negative cross-border externalities on the global financial system and economy. To the extent that similar externalities exist domestically, the introduction of D-SIB buffers came to be viewed as important at the national level.

In October 2012, the BCBS finalized its supervisory framework regarding D-SIBs. The Committee developed a set of principles that were categorized into two major groups (see **Appendix A**):

i. An assessment methodology used to identify banks in the national jurisdiction that have systemic importance and;
ii. A regulatory/supervisory regime to reduce the probability of failure of D-SIBs by increasing their going-concern loss absorbency.

The principles adopted by the Committee regarding the D-SIB framework allow for appropriate national discretion in the methodology used to assess the degree to which domestic banks are systemically important. The purpose of this discretion is to accommodate the structural characteristics of the domestic financial system while recognizing that a local authority is best placed to evaluate the impact of failure on the domestic financial system. The higher loss absorbency (HLA) required for D-SIBs were designed to be commensurate with the degree of systemic importance as identified by the assessment methodology of the domestic authorities.

2.2 Legal Context (Domestic)

The SyRB framework for Jamaica is being implemented pursuant to section 34L of the Bank of Jamaica (Amendment) Act, 2015 ("the Act"), which accords the Bank the responsibility for conducting "macro-prudential oversight of the financial institutions specified in subsection (3), for the purpose of maintaining the stability of the financial system."

In this context, section 34P indicates that the Bank may, in consultation with the Financial Policy Committee (the Committee) and the relevant regulatory authority, and having regard to the purposes specified in subsection (2), issue rules, standards and codes, which shall be applicable to any financial institution or a category thereof, and which rules, standards and codes shall relate to macro-prudential oversight under this Part.

(2) The rules, standards and codes referred to in subsection (1) shall be for the purpose of

(a) establishing and enforcing standards of conduct by financial institutions;
(b) ***preserving and maintaining stability in the financial system***; and
(c) specifying the time required for compliance by financial institutions to which such rules, standards and codes apply.

The SyRB will form part of Bank of Jamaica's 'Revised Implementation of the Basel III Capital Adequacy Framework' and will be an addition to the minimum regulatory capital adequacy (CAR) and the capital conservation buffer (CCB).[1] The framework prescribes a SyRB rate between 0 and 2.5 per cent of risk-weighted assets (RWAs). The SyRB will be made up of Common Equity Tier 1 capital (CET1), which can be readily used by financial institutions to absorb losses. Designated financial institutions will not, however, be able to use it to fulfil any other regulatory capital requirement. Similar to what pertains for the CCB, D-SIFIs will be restricted in their ability to make dividend payments and to offer share buybacks in the event that its total capital adequacy ratio is at or below the required level.[2] The designation of institutions as D-SIFIs and the requirement for these institutions to hold this additional capital does not mean that they are inherently risky, or are likely to fail; it is meant for them to acquire more insurance to *ensure* that they do not fail.

3. Scope

The firms in the scope of the SyRB framework are DTIs and securities dealers.[3]

There are three types of DTIs in Jamaica: commercial banks, building societies and merchant banks. The services offered by DTIs include deposit-taking, cheque services and lending. DTIs in Jamaica are mainly funded by deposits.

The securities dealers' business model generally includes (i) managing individual portfolios and (ii) buying and selling securities on their own account. Securities dealers are also involved in broker transactions, investment of a client's funds in a collective manner; providing funding to clients (e.g. margin loans, reverse repos) as well as the placing of financial instruments without a firm commitment basis.

4. Methodology for Assessing and Scoring Systemic Importance of Supervised Financial Entities

The Basel Committee, in its framework for dealing with domestic systemically important banks (D-SIBs), sets out the suggested criteria for assessing systemic importance:

i. size
ii. substitutability

[1] The capital conservation buffer is an additional capital requirement of 2.5% of RWA.
[2] Total capital adequacy ratio will be the minimum capital adequacy requirements (CAR) plus any additional capital buffer requirement prescribed by the Supervisor.
[3] Insurance companies have been initially excluded from the scope of this framework but will be assessed for inclusion in the near future.

iii. interconnectedness and

iv. complexity

What follows describes the rationale for each criterion and explores the indicators that can be used to classify institutions as D-SIFIs.

4.1 Size

The size of an institution matters in terms of its interaction with the domestic financial sector as well as its impact on the real economy. The failure of a financial institution is more likely to damage the economy or financial markets if it is large, either relative to the financial system or the economy. In addition, the failure of a large financial institution is more likely to damage *confidence* in the financial system, relative to the impact of a small institution. Size is therefore a key measure of systemic importance.

In the G-SIB framework, the BCBS uses total exposures (in the leverage ratio) to measure size. In principle, a bank's total exposure is the sum of: (a) on-balance sheet exposures; (b) derivative exposures; (c) securities financing transaction (SFT) exposures; and (d) off-balance sheet (OBS) items. On-balance sheet exposures reflect all balance sheet gross assets including, with a few exceptions, on-balance sheet derivatives collateral and collateral for SFTs. Derivative exposures are created from two types of exposures: (a) exposures arising from underlying derivative contracts; and (b) counterparty credit risk (CCR) exposures. SFT exposures are included in the exposure measure because secured lending and borrowing in the form of SFTs is an important source of leverage. Finally, off-balance sheet items include commitments (including liquidity facilities), whether or not unconditionally cancellable, direct credit substitutes, acceptances, standby letters of credit and trade letters of credit.[4]

A review of a selected set of countries indicates that, except for India that fully adopted the BCBS indicators, relative asset size is the common indicator of the size of an institution (see **Table** 1).

Table 1: Indicators of Size by Selected Country

Country	Australia[5]	Hong Kong	India	Malaysia[6]	New Zealand	Nigeria
Size Indicator	Total Resident Assets	Total Assets	Total exposure as defined for use in Basel III Leverage Ratio	Total assets; Total off-balance sheet exposures	Total Assets	Total Assets

[4] See Basel Committee, *Basel III: A global regulatory framework for more resilient banks and banking systems (December 2010)* and, *Basel III leverage ratio framework and disclosure requirements (January 2014)*.

[5] Australia Prudential Regulatory Authority (2013). Information Paper: Domestic systemically important banks in Australia. Australia.

[6] Bank Negara Malaysia (2020), 'Domestic Systemically Important Banks Framework', Central Bank of Malaysia, February.

4.2 Substitutability

The systemic impact of a financial institution's distress or failure relates to the extent that its services, both as a market participant and as a client service provider, are substitutable. The more substitutable an institution is in a particular business line or as a service provider, the smaller will be the disruption following its failure. In other words, the cost to clients of a failed financial institution in seeking the same services elsewhere is likely to be higher for institutions that provide specialised services. In this context, the identification of D-SIBs has to consider the types of roles that institutions play in the domestic financial market, which inform views about the substitutability of their services.

The BCBS uses four indicators in its G-SIB framework to measure substitutability: (i) assets under custody; (ii) payments activity; (iii) underwritten transactions in debt and equity markets; and (iv) trading volume. Assets under custody is defined as the value of assets that a bank holds as a custodian.[7] Payments activity is described as the value of a bank's payments sent through the main payments systems of which it is a member. Underwritten transactions in debt and equity markets reflects the annual value of debt and equity instruments underwritten by the bank. Trading volume is the total value of trading activities of a bank in secondary markets. Banks facilitate market liquidity through "market-making" (i.e. assuming the risk of holding securities in order to provide liquidity immediacy for clients) and agency-based trading, both of which are supported by substantial technology infrastructure and internal data systems that are difficult to substitute in the event of default.[8]

A review of other country experiences indicates that, of the selected jurisdictions, the most common indicators used for this category was, in one form or the other, (i) loans (Australia, Hong Kong, Malaysia, New Zealand and Nigeria) followed by (ii) assets under custody, (iii) activities in the payments and settlement system and (iv) underwriting activity for various asset classes (see Table 2).

[7] A custody relationship, in this context, refers to the provision of safekeeping, reporting, processing of assets and/or the facilitation of the operational and administrative elements of related activities on behalf of customers in the process of their transacting and retaining financial assets.

[8] See Basel Committee, Global systemically important banks - revised assessment framework *(March 2017) and Global systemically important banks: Assessment methodology and the additional loss absorbency requirement (July 2011) pages 7-10.*

Table 2: Indicators of Substitutability by Selected Country						
Country	Australia	Hong Kong	India[9]	Malaysia	New Zealand[10]	Nigeria[11]
Indicator	Assets under custody		Assets under custody	Total assets under custody		
	Payments activity		Payments made in INR using RTGS and NEFT systems	Value and volume of payments and settlement activities		
			National Electronic Fund Transfer (NEFT)			
	Underwritten transactions in debt and equity markets		Underwritten transactions in debt and equity markets	Underwriting activity.		
	Total gross loans and advances	Loans and advances to customers		Total loans extended to non-financial institution customers	Loans to Household and Non-financial Business	Total net credits
	Total household lending				Agriculture Loans	
		Deposits from customers		Total deposits from non-financial institutions	Total Deposits	Total deposits

[9] Reserve Bank of India (2017), 'A Framework for Dealing with Domestic Systemically Important Banks (D-SIBs) India', April.

[10] Reserve Bank of New Zealand (2019), 'A Framework for identifying Domestic Systemically Important Banks', April.

[11] Central Bank of Nigeria (2014), 'Framework for Regulation and Supervision of Domestic Systemically Important Banks', September.

4.3 Interconnectedness

Interconnectedness in a financial system refers to the relationships and dependencies that exist among financial institutions and markets. In other words, it is the degree to which various parts of the financial system are linked to and are dependent upon each other. Interconnectedness can take many forms, including interbank lending, the derivatives market and asset holdings.

For interbank lending, banks lend to each other to meet their short-term funding needs, which creates a network of interconnected liabilities. Where financial institutions use derivatives to hedge their risks or speculate on future movements in financial markets, this creates linkages between different markets and financial institutions. Common exposures, in which financial institutions hold similar assets or have exposures to similar markets or regions, can create spill over effects if one institution experiences a shock.

The degree of interconnectedness in a financial system can affect the transmission of shocks across the system. If one institution or market experiences a shock, it can spread quickly to other institutions and markets that are interconnected with it, which leads to systemic risk. An institution's systemic impact is likely to be positively related to the extent to which it is interconnected with other financial institutions.

The BCBS uses three indicators in its G-SIB framework to measure interconnectedness: (i) intra-financial system assets; (ii) intra-financial system liabilities; and (iii) securities outstanding.

Intra-financial system assets is the sum of lending to financial institutions (including undrawn committed lines), holdings of securities issued by other financial institutions, net mark to market (reverse) repurchase agreements with other financial institutions, net mark to market securities lending to financial institutions and net mark to market OTC derivatives with financial institutions.

Intra-financial system liabilities is the sum of deposits by financial institutions (including undrawn committed lines), all marketable securities issued by the bank, net mark to market repurchase agreements, net mark to market securities borrowing from financial institutions, and net mark to market OTC derivatives with financial institutions.

Securities outstanding includes debt securities, commercial paper and certificates of deposits a bank has outstanding, as well as the book value of its equity and its equity market capitalization.

A review of other country experiences showed that, of the selected jurisdictions, intra-financial assets, liabilities and securities outstanding are the most common indicators (see **Table** 3 below).

Table 3: Indicators of Interconnectedness by Selected Country						
Countries	Australia	Hong Kong[12]	India	Malaysia	New Zealand	Nigeria
Interconnectedness	Intra-financial system assets	Loans to financial concerns	Intra-financial system assets	Total intra-financial system assets		Intra-financial system assets
	Intra-financial system liabilities	Loans and advances from banks	Intra-financial system liabilities	Total intra-financial system liabilities		Intra-financial system liabilities
	Securities outstanding (Short-term securities, long-term borrowings and CDs)		Securities outstanding	Total securities outstanding	Debt securities issued	
						Net-interbank transactions
		Placements with Banks				
	Large exposures				Sum of each bank's Top 5 Exposures to Banks	

4.4 Complexity

Complexity arises when an institution's activities, organizational structure and operations are intricate and difficult to understand or analyse. Financial institutions can become complex due to various factors such as increasing the range of services and products that they offer, their size, geographical reach, or the complexity of their underlying financial instruments and transactions. In addition, complex financial institutions may have intricate legal structures that are difficult to comprehend. These complexities can make it challenging for stakeholders, including investors, regulators, and even the institution's management, to fully understand the institution's risk exposures, financial performance and overall operations.

Complex financial institutions can pose significant risks to the financial system if they fail or experience financial distress, as the complexity of their operations makes it difficult to resolve and costly to wind up in an orderly manner. These issues relating to assessment, resolvability and cost of winding up imply a large potential impact on financial stability.

12 Hong Kong Monetary Authority (2021), 'Systemically Important Banks', April.

In the global context, three measures of complexity are used: (i) notional amount of over-the-counter (OTC) derivatives; (ii) Level 3 assets; and (iii) trading and available-for-sale securities. The notional amount of OTC derivatives is the gross nominal (or notional) value of all deals concluded and not yet settled at the reporting date. The focus is on the amount of OTC derivatives that are not cleared through a central counterparty. The greater the number of non-centrally cleared OTC derivatives a bank enters into, the more complex is its activities.[13] Level 3 assets are assets whose fair value cannot be determined using observable measures, such as market prices or models. In addition, level 3 assets are illiquid and fair values can only be calculated using estimates or risk-adjusted value ranges. Trading and available-for-sale securities reflect the total value of the bank's holding of securities in the trading book and available for sale category.

A review of other country experiences indicates that, of the selected jurisdictions, the most common indicators of complexity are derivative exposures and the proportion of the securities portfolio that are marked as available for sale (see **Table** 4 below).

Table 4: Indicators of Complexity by Selected Country

Country	**Australia**	**India**	**New Zealand**	**Nigeria**
Indicators	Notional amount of OTC derivatives Trading and available-for-sale securities Risk-weighted assets for traded market risk	Notional amount of OTC derivatives Securities held for trading and available for sale Cross-jurisdictional Liabilities	Derivatives (asset side and liabilities side) Debt Securities Held	Branch network Number of foreign subsidiaries

According to BCBS, supervisory judgement may be used to support the results derived from the indicator-based measurement approach. In exceptional cases, supervisory judgement may even lead to the results of a quantitative assessment being overridden in that, despite receiving a non-systemic score, an institution may be classified as a D-SIFI. This caveat is intended to add robustness to the assessment by capturing information that cannot be easily quantified (for example a major restructuring of a bank's operation).

[13] Banks are asked to report the figure for total notional amount for all types of risk categories and instruments (i.e. sum of foreign exchange, interest rate, equity, commodities, CDS and unallocated).

5. Scoring The Systemic Importance of Jamaican Entities

This section describes the methodology that will be used to compute the D-SIFI scores for Jamaican DTIs and SDs. It closely follows the BCBS' methodology by establishing a set of indicators for each sector and classifying them into the broad categories discussed above.

The methodology to identify D-SIFIs requires the creation of a "score" or ranking for DTIs and securities dealers on the basis of the above criteria. The D-SIFI score for a Jamaican DTIj or SDj at the end of period "i" is therefore calculated as follows:

$$\text{SCORE}_{ji} = \varphi_1(\text{SIZE}_{ji}) + \varphi_2(\text{SUBSTITUTABILITY}_{ji}) + \varphi_3(\text{INTERCONNECTEDNESS}_{ji}) + 0 \times (\text{COMPLEXITY}_{ji}) \quad (1)$$

Bank of Jamaica's methodology assigns an equal weight to the first three categories, with the fourth category (complexity) being assigned a weight of zero.[14]

5.1. Deposit Taking Institutions

5.2.1 Size

The score for the size category for DTI "*j*" at time "*i*" is calculated using one indicator; total assets (TA) relative to the sum of nominal GDP for the four quarters to time "t" (December 2022).

$$\text{SIZE}_{ji} = \left(\frac{\text{TA}_{ji}}{\text{GDP}_t}\right) \times 1000 \quad (2)$$

5.2.2 Substitutability

The services that, if disrupted, could have an impact on the real economy due to the time and expense to find replacement providers, is the key to assessing substitutability. The score for the substitutability category for DTI "j" at time "i" is therefore calculated with reference to three indicators; (1) a bank accessibility index (BAI), (2) total deposits (DT) and (3) total loans and advances (LA):

$$\text{SUBSTITUTABILITY}_{ji} = \left[\frac{1}{3}\left(\frac{\text{BAI}_{ji}}{\sum_j^n \text{BAI}_{ji}}\right) + \frac{1}{3}\left(\frac{\text{DT}_{ji}}{\sum_j^n \text{DT}_{ji}}\right) + \frac{1}{3}\left(\frac{\text{LA}_{ji}}{\sum_j^n \text{LA}_{ji}}\right)\right] \times 1000 \quad (3)$$

[14] A review of the data on DTIs balance sheets indicate that (1) DTIs do not report OTC derivatives and (2) the most common derivative used is foreign currency (FX) forwards but they are not widely available in the banking system and their size are relatively small. In any event FX forwards in Jamaica are not complex instruments. The only available indicator is therefore "trading and available for sale securities" (AFS). However, Bank of Jamaica's assessment suggests that some institutions appear to exercise discretion in marking their portfolio as "held to maturity" which carries the potential to significantly affect the results of the assessment. In the context of the unavailability of suitable indicators for this category, the Bank has therefore opted to assign a zero weight to this category. The weighting may be revisited in the future if the operations of financial institutions change or if a suitable indicator becomes available.

Total deposits as well as loans and advances are used as proxies for the varying characteristics of the services offered by DTIs.

For the purpose of this paper, *bank accessibility index* refers to the reach of a DTI in terms of service availability and delivery to customers and which comprises (a) the number of branches (B) and (b) the number of ATMs for each bank (A), all relative to the totals for the financial system:

$$\mathrm{BAI_{ji}} = \left[\frac{3}{4}\left(\frac{\mathrm{B_{ji}}}{\sum_{j}^{n}\mathrm{B_{ji}}}\right) + \frac{1}{4}\left(\frac{\mathrm{A_{ji}}}{\sum_{j}^{n}\mathrm{A_{ji}}}\right)\right] \times 1000 \quad (4)$$

The number of branches and ATMs measures each bank's geographical reach in terms of service availability and delivery. The existence of relatively large branch and ATM networks signifies the ability of a bank to provide services in geographical areas where other banks are not easily able to. The number of branches relative to the system's total is more heavily weighted, relative to total number of ATMs because branches tend to be less substitutable than ATMs, given the heavy fixed cost involved in establishing branches and the cultural propensity prevailing in Jamaica for using in-branch services relative to ATMs.

5.2.3 Interconnectedness

The score for interconnectedness for DTI "j" at time "i" is calculated with reference to three indicators; (1) gross interbank funding liabilities to other domestic banks and securities dealers (*L*), (2) gross interbank funding claims on other domestic banks and securities dealers (*C*) and (3) interbank funding relations with other financial entities (*R*).[15] Interbank funding relations is the number of funding relationships (funding to links) with other local institutions. The greater the number of links, the higher the potential for spill-overs onto clients and/or creditors. [16]

$$\mathrm{INTERCONNECTEDNESS_{ji}} = \left[\frac{4.5}{10}\left(\frac{\mathrm{L_{ji}}}{\sum_{j}^{n}\mathrm{ET_{ji}}}\right) + \frac{4.5}{10}\left(\frac{\mathrm{C_{ji}}}{\sum_{j}^{n}\mathrm{ET_{ji}}}\right) + \frac{1}{10}\left(\frac{\mathrm{R_{ji}}}{\sum_{j}^{n}\mathrm{R_{ji}}}\right)\right] \times 1000 \quad (5)$$

Note that gross interbank funding liabilities to total system gross interbank funding exposure and gross interbank funding claims as a share of total system gross interbank funding exposure are more heavily weighted, relative to the number of funding relations (R), because the latter serves as a supplementary indicator in this category.

[15] The inclusion of the number of funding relations seeks to capture the degree of reliance on particular institutions to carry out interbank funding transactions which improves the standard measure of interconnectedness.
[16] Links refers to the connection an institution may have with other DTIs and/or securities dealers.

Table 5 below summarises the list of indicators and their associated weights in the systemic risk score.

Table 5. D-SIFI Indicators with Weights (DTIs)

Systemic Score Criteria	Weighting
Size	**33.33%**
Total assets to nominal GDP	1
Substitutability	**33.33%**
Bank accessibility index	0.33
Number of branches	
Number of ATMs	
Total deposits to total system deposits	0.33
Total loans and advances to total system loans and advances	0.33
Interconnectedness	**33.33%**
Gross interbank funding claims to total system exposure	0.45
Gross interbank funding liabilities to total system exposure	0.45
Interbank funding relations to total system	0.10
Complexity	**0%**

5.2 Securities Dealers

In developing the criteria and indicators for assessing the systemic importance of securities dealers, the indicators used to identify domestic systemically important deposit taking institutions were considered and adapted to the sector.

5.2.1 Size

The score for the size category for SD "*j*" at time "*i*" is calculated with reference to (i) total assets relative to nominal GDP for the four quarters to time "*i*" and (ii) the SDs off-balance sheet funds under management (FUM), relative to the total held by the system. The two indicators are weighted unequally. The lower weight for FUM reflects the view that the impact on the economy/financial system of the outright failure of the SD's client is less than failure of an SD, as the former flows more through the balance sheet of the clients and less so through that of the SD. A failure of an SD has the potential for contagion and confidence shocks which magnifies the systemic importance of the failure.

$$\mathrm{SIZE_{ji}} = \left(\frac{7}{10}\left(\frac{\mathrm{TA_{ji}}}{\mathrm{GDP_t}}\right) + \frac{3}{10}\left(\frac{\mathrm{FUM_{ji}}}{(\sum_j^n \mathrm{FUM_{ji}})}\right)\right) \times 1000 \qquad (6)$$

5.2.2 Substitutability

There are no appropriate indicators for the substitutability category of the SD sector. The indicators as prescribed by the BCBS are generally not applicable to the sector.[17] Therefore, the parameter φ_2 in equation 1 is set to zero for this set of institutions.

5.2.3 Interconnectedness

Similar to DTIs, the score for the interconnectedness category of SD "*j*" at time "*i*" is calculated with reference to three indicators: (i) gross interbank funding liabilities to other domestic banks and securities dealers (L), (ii) gross interbank funding claims on other domestic banks and securities dealers (C) and (iii) inter-institutional funding relations with other financial entities (R).

$$\text{INTERCONNECTEDNESS}_{ji} = \left[\frac{4.5}{10}\left(\frac{L_{ji}}{\sum_j^n L_{ji}}\right) + \frac{4.5}{10}\left(\frac{C_{ji}}{\sum_j^n ET_{ji}}\right) + \frac{1}{10}\left(\frac{R_{ji}}{\sum_j^n R_{ji}}\right)\right] \times 1000 \quad (7)$$

Note that gross interbank funding liabilities to total system gross interbank funding exposure and gross funding claims as a share of total system gross funding exposures are more heavily weighted, relative to funding relations, which serves as a supplementary indicator.

Table 6 below summarises the list of indicators and their associated weights in the systemic risk score for SDs.

Table 6. D-SIFI Indicators with Weights (Securities Dealers)

Systemic Score Criteria	Score Weighting
Size	**50.0%**
Total assets to nominal GDP	0.70
Off balance sheet funds under management to total system funds under management	0.30
Substitutability	**0.0%**
Interconnectedness	**50.0%**
Securities dealer liabilities to total exposure	0.45
Securities dealer claims to total exposure	0.45
Securities dealer relations to system	0.10
Complexity	**0.0%**

6. Threshold for Systemic Importance

An important element in the implementation of the SyRB framework is the selection of a threshold, below which financial institutions are not considered to be systemically important and therefore would

[17] The Bank will keep this indicator under review.

not warrant a SyRB rate. The approach to the selection of a threshold for Jamaica is again guided by the BCBS' G-SIB framework as well as those undertaken in several jurisdictions.[18,19]

For the quantitative selection criteria, this paper uses the Jenks Natural Breaks (JNB) (1971) optimization method to determine the threshold that determines whether institutions are designated as D-SIFIs. The JNB algorithm divides the ordered (ascending) scores for the set of institutions being considered into selected clusters, with the D-SIFIs being the cluster with the highest scores.[20] The systemic threshold is approximated by the highest score of the non-systemic cluster. Based on the scores calculated from the data at end-2022, a DTI or a securities dealer will be deemed to have systemic importance if it has a total D-SIFI score higher than 90. This selected threshold is to be regarded as preliminary and may be adjusted after the consultation process has ended. Following the formal designation of the D-SIFIs, the threshold will be reviewed every 2 years.

7. Calibration of the Systemic Risk Buffer

The objective of this section is to outline the calibration methodology that will be used for the SyRB. The approach will be to set capital buffers for D-SIFIs commensurate with estimates of the damage that these institutions could cause to the economy in the event of distress. In other words, the D-SIFI score will be used as a proxy for the impact that a financial institution could have on the economy in the event of its failure or distress. This means that the SyRB will be calibrated in such a way as to reflect the systemic importance of financial institutions in that those institutions with higher scores will be subject to higher buffer requirements/rates.

Institutions whose SIFI scores fall below the aforementioned threshold will be subjected to a zero per cent SyRB rate, while those with scores above that threshold will be subject to SyRB rates ranging

[18] The Basel Committee did not define a definite threshold value to differentiate between systemic and non-systemic banks in the domestic context. However, in the global context a tentative cut-off point was set between the 27th and 28th banks in their sample based on the clustering of scores produced by the indicator-based methodology. See Basel Committee on Banking Supervision (2011), 'Global Systemically Important Banks: Assessment Methodology and the Higher Loss Absorbency Requirement', Bank for International Settlements, July. (page 10).

[19] Some international practices include:
-In Malaysia the cut-off threshold is calibrated with reference to the distribution of financial institutions' overall scores and cluster analysis (see Bank Negara Malaysia (2020), 'Domestic Systemically Important Banks Framework', Central Bank of Malaysia).
-For Hong Kong, once systemic scores were calculated, the Monetary Authority determined a cut-off threshold above which AI's are considered systemically important by taking into consideration the overall distribution of scores and cluster analysis (see Hong Kong Monetary Authority (2021), 'Systemically Important Banks').
-For Oman, thresholds were defined by reviewing explicit or implicit threshold levels gleaned from practices in other jurisdictions while taking into consideration the banking sector of Oman (see Central Bank of Oman (2015), 'Domestic Systemically Important Banks (D-SIBs) Framework for Oman')

[20] The Jenks optimization method is a data clustering method to determine the best arrangement of values into different classes. This is done by seeking to minimize each class's average deviation from the class mean, while maximizing each class's deviation from the means of the other classes. In other words, the method seeks to reduce the variance within classes and maximize the variance between classes. (Jenks, G.F. and Caspall, F.C., 1971. Error on choroplethic maps: definition, measurement, reduction. Annals of the Association of American Geographers, 61(2), pp.217-244. Jenks, G.F., 1963. Class intervals for statistical maps. Int Yearbook Cartography, 3, pp.119-134.)

between 1 per cent and 2.5 per cent of risk-weighted assets (RWAs), in increments of 0.5 per cent. A "bucket approach" will be used to specify the non-zero SyRB rates for D-SIFIs. This means that, based on the magnitude of its score, a D-SIFI will be placed in a bucket relating to a range of scores.[21,] The buckets will be equally sized and range from 1 to 5, where each bucket will be linked to a specific capital surcharge. Bucket 4 will capture institutions with the highest degree of systemic importance while bucket 5 will be intentionally designated as an empty bucket with a CET1 capital requirement of 3.5 per cent. This bucket should be a disincentive for institutions becoming more systemically important after reaching the fourth bucket (see Table 7).

Table 7. Potential D-SIFI Capital Surcharge Structure

Bucket	Capital Surcharge Applicable (%)
5 (empty)	3.5
4	2.5
3	2.0
2	1.5
1	1.0

8. Phase-In Process

The prescribed capital surcharges above will be phased in over four years. Table 8 shows the calculation of the maximum SyRB in each year of the phase-in period.[22]

Table 8. Incremental Buffers Associated with a 2.5 per cent SyRB requirement

Year	Maximum SyRB Surcharge Applicable
Year 1	25% * [2.5%] = 0.625%
Year 2	50% * [2.5%] = 1.25%
Year 3	75% * [2.5%] = 1.875%
Year 4	100% * [2.5%] = 2.50%

Following the designation of a financial institution as a D-SIFI, the institution will have a year to achieve the required initial 25.0 per cent of the surcharge applicable to it. At the end of subsequent

[21] This approach is broadly consistent with the Basel Committee's G-SIB framework and that used by the Bank of England in their Systemic Risk Buffer Framework. See Basel Committee on Banking Supervision, Global systemically important banks: revised assessment methodology and the higher loss absorbency requirement (2018) & Bank of England, The Financial Policy Committee's framework for the systemic risk buffer (2016).

[22] Recall the maximum capital surcharge applicable is 3.5 per cent, and has been allocated to the fourth bucket.

years, this percentage will be increased to 50.0 per cent, 75.0 per cent and then 100.0 per cent of the requirement by the fourth year.

Financial institutions may move in and out of D-SIFI status, or they may change "buckets". The pace of movement through the classifications will, however, be asymmetric, depending on the direction of change. In the event that a financial institution that was first designated as a D-SIFI or moves up one or more buckets as a result of an increase in its degree of domestic systemic importance, it will be required to build up its CET1 for HLA purposes within 12 months following Bank of Jamaica's formal notification. However, if a lower capital surcharge is applied to a designated D-SIFI due to a reduction in its degree of systemic importance or it ceasing to be a D-SIFI, this financial institution may recognise the lower capital surcharge immediately, following the BOJ's formal notification.

The assessment will be updated annually to determine D-SIFIs and the appropriate SyRB rates. The names of the financial institutions classified as D-SIFIs will be published on the Bank's website. Additionally, in order to allow financial institutions to compute their systemic importance scores and help them in their capital planning process, Bank of Jamaica will also disclose the specific data used to calculate the D-SIFI score (and its sub-criteria) and associated capital surcharge.

9. Summary & Conclusion

This paper has outlined the framework for a systemic risk capital surcharge for D-SIFIs in Jamaica. Systemically important financial institutions may impose negative externalities on the domestic financial system and economy if they fail. The surveillance of institutions deemed "too systemic to fail" has become increasingly important globally, with a number of countries having formally introduced their D-SIB frameworks under the general guidance of the Basel Committee on Banking Supervision.

For domestic DTIs and securities dealers, the paper (i) outlined the criteria for assessing systemic importance, (ii) developed a quantitative measure that summarises these criteria; (iii) outlined the calibration procedure for the SyRB and (iv) described some of the key processes involved in the effective implementation and review of the D-SIFI capital surcharge. The designated D-SIFIs for Jamaica and the capital surcharge associated with their status will be published after the consultation period has ended.

Appendix A

Basel Committee's D-SIB Principles

Principles 1 to 7 focus mainly on the assessment methodology for D-SIBs while Principles 8 to 12 focus on HLA for D-SIBs.

Assessment methodology

Principle 1: National authorities should establish a methodology for assessing the degree to which banks are systemically important in a domestic context.

Principle 2: The assessment methodology for a D-SIB should reflect the potential impact of, or externality imposed by, a bank's failure.

Principle 3: The reference system for assessing the impact of failure of a D-SIB should be the domestic economy.

Principle 4: Home authorities should assess banks for their degree of systemic importance at the consolidated group level, while host authorities should assess subsidiaries in their jurisdictions, consolidated to include any of their own downstream subsidiaries, for their degree of systemic importance.

Principle 5: The impact of a D-SIB's failure on the domestic economy should, in principle, be assessed having regard to bank-specific factors:

(a) size;

(b) interconnectedness;

(c) substitutability/financial institution infrastructure (including considerations related to the concentrated nature of the banking sector); and

(d) complexity (including the additional complexities from cross-border activity).

In addition, national authorities can consider other measures/data that would inform these bank-specific indicators within each of the above factors, such as size of the domestic economy.

Principle 6: National authorities should undertake regular assessments of the systemic importance of the banks in their jurisdictions to ensure that their assessment reflects the current state of the relevant financial systems and that the interval between D-SIB assessments not be significantly longer than the G-SIB assessment frequency.

Principle 7: National authorities should publicly disclose information that provides an outline of the methodology employed to assess the systemic importance of banks in their domestic economy.

Higher loss absorbency

Principle 8: National authorities should document the methodologies and considerations used to calibrate the level of HLA that the framework would require for D-SIBs in their jurisdiction. The level of HLA calibrated for D-SIBs should be informed by quantitative methodologies (where available) and country-specific factors without prejudice to the use of supervisory judgement.

Principle 9: The HLA requirement imposed on a bank should be commensurate with the degree of systemic importance, as identified under Principle 5.

Principle 10: National authorities should ensure that the application of the G-SIB and D-SIB frameworks is compatible within their jurisdictions. Home authorities should impose HLA requirements that they calibrate at the parent and/or consolidated level, and host authorities should impose HLA requirements that they calibrate at the sub-consolidated/subsidiary level. The home authority should test that the parent bank is adequately capitalised on a stand-alone basis, including cases in which a D-SIB HLA requirement is applied at the subsidiary level. Home authorities should impose the higher of either the D-SIB or G-SIB HLA requirements in the case where the banking group has been identified as a D-SIB in the home jurisdiction as well as a G-SIB.

Principle 11: In cases where the subsidiary of a bank is considered to be a D-SIB by a host authority, home and host authorities should make arrangements to coordinate and cooperate on the appropriate HLA requirement, within the constraints imposed by relevant laws in the host jurisdiction.

Principle 12: The HLA requirement should be met fully by Common Equity Tier 1. In addition, national authorities should put in place any additional requirements and other policy measures they consider to be appropriate to address the risks posed by a D-SIB.

Appendix B

Jenks Natural Breaks Classification Method

The Jenks optimization method is a data clustering method to determine the best arrangement of values into different classes. It seeks to minimize each class's average deviation from the class mean, while maximizing each class's deviation from the means of the other classes.

The method requires an iterative process. That is, calculations must be repeated using different breaks in the dataset to determine which set of breaks has the smallest in-class variance. The process is started by dividing the ordered data into arbitrary classes and then repeatedly performing the following three steps:

i. Calculate the sum of squared deviations from the class means (SDCM).

ii. Choose a new way of dividing the data into classes, perhaps by moving one or more data points from one class to a different one.

iii. Calculated new class deviations.

until the sum of the "within class deviations" is minimised.

An Example

Step 1: Calculate the "sum of squared deviations for array mean" (SDAM)

$$list\ of\ scores = [4, 5, 9, 10]$$

$$mean = \frac{(4 + 5 + 9 + 10)}{4} = 7$$

$$SDAM = (4 - 7)^2 + (5 - 7)^2 + (9 - 7)^2 + (10 - 7)^2 = 26$$

Step 2: For each range combination, calculate "sum of squared deviations for class means" (SDCM_ALL), and find the smallest one. SDCM_ALL is similar to SDAM but uses class means and deviations.

Combination 1: $[4][5, 9, 10]$

$$SDCM_{ALL} = (4 - 4)^2 + (5 - 8)^2 + (9 - 8)^2 + (10 - 8)^2 = 14$$

Combination 2: $[4, 5][9, 10]$

$$SDCM_{ALL} = (4 - 4.5)^2 + (5 - 4.5)^2 + (9 - 9.5)^2 + (10 - 9.5)^2 = 1$$

Combination 3: $[4, 5, 9][10]$

$$SDCM_{ALL} = (4 - 6)^2 + (5 - 6)^2 + (9 - 6)^2 + (10 - 10)^2 = 14$$

Step 3: As a final summary measure, calculate a "goodness of variance fit" (GVF), defined as $GVF = \frac{(SDAM - SCDM)}{SDAM}$. GVF ranges from 1 (good fit) to 0 (bad fit).

$GVF_{combinaton\ 2} = \frac{(26-1)}{26} = 0.96$

$GVF_{combinaton\ 1,3} = \frac{(26-14)}{26} = 0.46$

GVF for $[4, 5][9, 10]$ is the highest (closest to 1) indicating that this combination is best for the list [4, 5, 9, 10].

Table 1:
System Values (DTIs and SDs) & Other Indicators
at end December-2022

DTIs		SDs	
Size			
Total Assets (J$ 000)	1,674,125.1	**Total Assets**	831,453.2
Nominal GDP (J$bn) (Year to December 2022)	2,623.3		
Substitutability			
Total Deposits (J$ 000)	2,451,649.7	**Funds Under Management**	723,848.8
Total Loans and Advances (J$ 000)	1,250,922.1		
Total Number of Branches	154		
Total Number of ATMs	823		
Interconnectedness			
Interbank Funding Relations	80	Interbank Funding Relations	44
Total exposure (J$ 000)	123,135,474.9		123,135,474.9

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