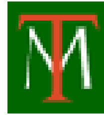

THOMAS MURRAY

Capital Market Infrastructure Risk Ratings ("CMIRR")

METHODOLOGY PAPER

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THOMAS MURRAY

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Capital Market Infrastructure Risk Rating

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1. Methodology for determining the Capital Market Infrastructure Risk Ratings (CMIRRs)

a. Purpose

The purpose of rating capital market infrastructures is to determine the extent to which an infrastructure minimises recognised risks and maximises asset safety for investors.

An investor who turns over their portfolio once a year is exposed to various settlement risks for 3 days (or however long the settlement cycle is) and exposed to various safekeeping and asset servicing risks for the remaining 362 days of the year. The CMIRR assess an investor's exposure to these risks, firstly at the country level and secondly, in more detail, at the individual risk exposure level where typically, but not always, the majority of risk resides.

A CMIRR assesses the risk exposure for an investor in the post trade capital market infrastructure, either when transactions are settled or while securities are held in a particular country. It assesses the effectiveness of organisations and processes involved in post-exchange settlement and safekeeping at minimising investor risk exposure. CMIRRs and individual risk exposures can be compared across markets. It does not assess the execution risk at the exchange but the settlement, safekeeping and asset servicing risks subsequent to such executions.

The scope of CMIRR covers the key procedures required to settle and service securities in a particular country and encompasses an analysis of custody, clearing and settlement procedures within stock exchanges (for instance where there is no Central Securities Depository - CSD), CSDs, payment systems, and any physical market procedures still operating outside of these entities.

Market risk elements that are excluded include investment risk, legal risk, macroeconomic, political and social trend analysis.

Infrastructure organisations vary country by country. Typical components include:

- Matching systems
- Central counterparty or clearing house
- Central securities depository
- Other settlement and safekeeping systems mechanism
- Asset servicing mechanism
- Cash settlement systems

Most of these components will be present in a country in some form, even the most unsophisticated. Central counterparty or clearing organisations tend to be separate from the depository (but in some countries these operations are combined in a single legal vehicle) while only a few CSDs are actually banks that can carry out cash settlement on their own behalf. Typically depositories instruct cash settlement either via its appointed settlement banks or directly to the central bank.

Settlement and safekeeping usually reside in the CSD, whose responsibilities may also include

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matching. The procedures for settlement and safekeeping can be highly automated through these organisations or they may be manual processes outside of these organisations (for example where OTC trades settle between brokers). The CMIRRs look to all mechanisms irrespective of whether there is a designated organisation responsible for carrying them out or whether the arrangements are bespoke between the participants.

The CMIRR and associated individual risk exposures, referred to as Risk Exposure Assessments (REAs) enable an investor to compare capital market infrastructure risk exposures across countries. The ratings are risk exposure ratings based on an absolute and hence comparable ratings scale. (Refer to Appendix I and II) The ratings measure the capital market infrastructure risk exposure a fund suffers irrespective of which infrastructure organisation is present in the country or the particular method adopted to settle and safe-keep securities. Thus it is impossible to directly compare DTCC in the USA with CBLC in Brazil. It is, however, possible to compare the risk exposures which investors in the USA and Brazil are exposed to when buying, selling or holding securities in those markets. For example, the particular methods chosen to prevent failing settlements (auto-borrowing, buy-ins or blocking of securities/cash) is not important, but the effectiveness of the chosen methods to minimise risk exposures arising from failing settlements that will determine the rating.

A key component in any market infrastructure when considering asset safety is the CSD. These organisations were traditionally set up to handle securities either in immobilised or dematerialised form and in many cases to co-ordinate the delivery versus payment (DvP) of securities against cash. CSDs were often set up as monopolies and run by the market for the market. Surpluses were used either to reduce fees or provide rebates to members/participants. Recently, many CSDs have been demutualised and now engage in commercial activities which may alter their risk profile. In addition, many have broadened their participation criteria which impacts the counterparty risk associated with their use. Each CSD operates differently and thereby provide varying degrees of risk minimisation for institutions routing transactions through these organisations.

The REA ratings are a blend of both the CSD risk exposures and the physical market risk exposure in each country. Investors wishing to review just CSD risk exposures should refer to the Thomas Murray Depository Risk Assessments at www.thomasmurray.com.

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2. Weightings

The key criteria for assessing CMIRR and overall weightings of each of the three key sections are as follows (Refer to Appendix III for the risk definitions):

Key Criteria Group Weighting (%)

1. Clearing and settlement (33%)

- Primary risks include: Asset commitment risk, counterparty risk and liquidity risk.
- Factors include: Securities and cash settlement system, credit facilities, stock lending facilities, settlement cycle and model, participation criteria, guarantee funds and financial condition of the utilities.

2. Safekeeping (33%)

- Primary risks include: Financial risk and operational risk.
- Factors include: Procedures and controls surrounding the settlement and safekeeping processes, nominee arrangements, segregation routines and registration arrangements.

3. Asset servicing (33%)

- Primary risks include: Asset servicing risk exposure.
- Factors include: Corporate action and proxy arrangements, centralised information source and obligations on issuers to provide information.

3. Determining the Risk Exposure Assessment ("REA")

Risk Exposure Assessments (i.e. asset commitment, liquidity, counterparty, financial, asset servicing and operational risk exposures) determine specific risk exposures associated with the CSD (i.e. the dematerialised or immobilised part of the settlement process) and the rest of the capital market infrastructure. Appendix II defines these risks. A series of key criteria are assessed to form an opinion that determines the magnitude of each risk exposure.

Sovereign ratings issued by major credit rating agencies are used as a factor to adjust selected REAs (i.e. liquidity, counterparty, financial and asset servicing risk exposures) to reflect the condition of the underlying banking and payments systems within a country. Any country with a sovereign rating below BBB will be affected by this factor, which progressively increases the handicap through to the lowest rating C.

Each REA is assessed within two primary categories (i.e. the dematerialised/ immobilised and other/physical) to enable the relative importance of each local market settlement process to be determined. The scores for each REA are aggregated, weighted in line with the proportion of dematerialised/immobilised vs. physical securities and a rating applied.

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4. Determining the CMIRR

The CMIRR is derived from individual REAs (Refer to the REA section above) together with other clearing and settlement, safekeeping and asset servicing factors affecting each capital market infrastructure, which are not included within the scope of the REAs.

The overall scores for each of the three risk categories are aggregated and a weighting (Refer to Weighting section above) applied to the result. The weightings take account of the relative importance of each individual risk category. The scores are then aggregated and the CMIRR rating is determined.

The Thomas Murray Rating Policy Board will review individual criteria and scores that carry sufficient weight to affect the CMIRR or any REA as part of the rating approval process.

5. The rating process

The process is as follows:

1. Running assessments of individual risk exposures (i.e. asset commitment, liquidity, counterparty, financial, operational and assets servicing risks) are maintained by Thomas Murray across 89 markets.

2. Daily notification of changes to local capital market infrastructure arrangements, rules, procedures and controls are received from multiple local market sources.

3. Market changes likely to affect individual REAs whether in CSDs or the physical market are identified, validated and the risk impact is assessed by Thomas Murray analysts against the assessment criteria.

4. Where a market change is immediate the individual REA is updated and a change bulletin issued (up to three updates are made daily).

5. Where a market change is a future event the "outlook" for an individual REA is updated and bulletin issued setting out the ratings impact once the change is implemented.

6. The CMIRR and outlook is updated daily to reflect the market changes affecting individual REAs which impact the CMIRR. The associated CMIRR report is updated, as required, to reflect material changes.

7. Validation of the rating change is made via relevant entities. Rating changes arising from validation routines are issued as required.

8. The Thomas Murray Rating Policy Board meet daily to affirm CMIRR and REA changes.

9. On-site due diligence takes place periodically through a rolling program of local market visits carried out by Thomas Murray staff.

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6. Outlook Scale

The overall rating and each REA contain an Outlook indicator, which indicates the direction the rating is moving, which is set using all the sources used to maintain the ratings and future changes/announcements which are likely to impact a rating in the future. The outlook scale is:

- Stable: There are no factors at this time that would affect the CMIRR or REA rating.
- Positive: Factors that may result in an improvement in the CMIRR or REA rating.
- Negative: Factors that may result in a deterioration of the CMIRR or REA rating.
- On Watch: Factors that may result in a change in the CMIRR or REA rating, but the direction of the change is uncertain at this time

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Appendix 1: CMIRR Scale

Capital Market Infrastructure Risk Ratings (CMIRR) are a Thomas Murray opinion of the post trade risk exposures to which an asset owner (normally a fund) is exposed whether buying or selling securities in local capital markets. The overall rating assigned to the local capital market infrastructure is based on Thomas Murray's assessment of six individual Risk Exposure Assessments. The CMIRR is based on an alpha scale from "AAA" being the highest rating to "C" being the lowest rating. The scale indicates that Thomas Murray's opinion is that the level of risk exposure suffered by investors within a capital market infrastructure is:

Rating	Risk exposure
AAA	extremely low
AA+	very low
AA	very low
AA-	very low
A+	low
A	low
A-	low
BBB	acceptable
BB	less than acceptable
B	quite high
CCC	high
CC	very high
C	beyond any acceptable level of risk exposure

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Appendix II: Risk Exposure Assessment

A Risk Exposure Assessment is Thomas Murray's opinion of the ability of a capital market infrastructure to minimise specific post trade risk exposures suffered by investors when investing in or out of the relevant country. The rating is based on an alpha scale from "AAA" being the highest rating to "C" being the lowest rating. The ratings correspond to Thomas Murray's assessment of risk exposure based on relevant factors influencing each risk exposure evaluated. The rating takes into account the structures, procedures, resources and controls used within the capital market infrastructure to minimise investors risk exposure to potential losses when investing in the country. The scale indicates that Thomas Murray's opinion is that the specific level of risk exposure suffered by investors within the capital market infrastructure is:

Rating	Risk exposure
AAA	extremely low
AA+	very low
AA	very low
AA-	very low
A+	low
A	low
A-	low
BBB	acceptable
BB	less than acceptable
B	quite high
CCC	high
CC	very high
C	beyond any acceptable level of risk exposure

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Appendix III: Risk Definitions and explanation

Asset Commitment Risk - The period of time from when control of securities or cash is given up until receipt of countervalue.

Asset commitment risk identifies the time during which securities and cash are tied up during the settlement process, assuming that everything settles according to schedule. The impact is the unavoidable opportunity cost associated with the assets committed to the settlement process.

This risk talks to time period during which a participant's assets, either cash or stock, have their use restricted within the securities processing and payment system pending final settlement of the underlying transaction(s). Following settlement, the risk period is extended until the transfer of funds and stock become final. It excludes any periods when assets, cash or stock, are committed to a market participant including brokers, banks and custodians, not caused by CSD processing.

Liquidity Risk - The risk that insufficient securities and or funds are available to meet commitments; the obligation will be covered some time later.

Liquidity risk identifies the risks that start to arise as securities and cash do not settle according to schedule. Liquidity risk covers the situation where securities or cash are delivered late to the settlement process but in a situation that does not warrant a default. The impact is the opportunity cost of the assets delivered late.

This can occur for certain technical reasons (e.g. stock out on loan, stock in course of registration, turn round of recently deposited stock is not possible) one or both parties to the trade has a shortfall in the amount of funds (credit line) or unencumbered stock available to meet settlement obligations when due. These shortfalls may lead to settlement fails but do not normally lead to a default.

Counterparty Risk - The risk that a counterparty (i.e. an entity) will not settle its obligations for full value at any time.

Counterparty risk arises where participants are no longer just late delivering securities or cash but are actually deemed to be in default. It is the total default of a direct participant in the market whether or not use is made of the CSD or a utility including the CSD. This is the event when a participant is unable to meet its financial liability to, say, the CSD and possibly other creditors. When the counterparty is the CSD or an associated clearing house this might require the liquidation of the organisation concerned. Provided a DvP system is properly operating the impact will be limited to the replacement cost of a transaction that will never be settled. If the settlement is on an FOP basis then the whole principal amount could be at risk.

Asset Servicing Risk - The risk that a participant may incur a loss arising from missed or inaccurate information provided, or from incorrectly executed instructions, in respect of corporate actions and proxy voting.

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Asset servicing risk explores the consequences of late deliveries (in information or instructions) surrounding corporate actions (associated with the custody of securities as opposed to the settlement of securities). The impact can be small if it is just the opportunity cost, but could be large if corporate events are missed and the situation cannot be recovered (e.g. a missed rights issue or takeover).

This risk arises when a participant places reliance on the information, say provided by a depository, or when the participant instructs the depository to carry out an economic transaction on its behalf. If the depository fails either to provide the information or to carry out the instruction correctly or in a timely manner the participant may suffer a loss for which the depository may not accept liability. The depository may provide these services on a commercial basis, without statutory immunity, or it may provide the service as part of its statutory role, possibly with some level of protection from liability.

Financial Risk - The ability of the CSD or other market participants to operate as financially viable entities.

Financial risk measures the exposure of the whole market to a situation where the depository itself is at risk. It assesses whether capital is sufficient to meet the on-going operation of the organisation. The impact in this case could be systemic and likely to trigger significant opportunity, replacement or principal risk across the market depending on the position of the participants. It also assesses the risk when the CSD acts as a central counterparty to transactions.

This risk also concerns the financial strength of participants in the market where settlement takes place outside the depository. In this instance the sovereign rating of the country is used as a proxy for the payments systems and as a defacto cap on the credit ratings of financial institutions participating in clearing, settlement and safekeeping in the local capital market infrastructure. This is a very approximate guide and care should be taken to assess the financial stability of your chosen counterparty used in the settlement process.

Operational Risk - The risk that deficiencies in information systems or internal controls, human errors or management failures will result in losses.

Operational risk identifies major contributing factors to a potential depository or infrastructure default that are not analysed in the preceding risks. The impact of an operational error or a depository's inability to resume operations following a disaster could lead to systemic risk independently of the state of the depositories finances.

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