



Enhancing Efficiency in Multi-Asset and Multi-Market CCPs

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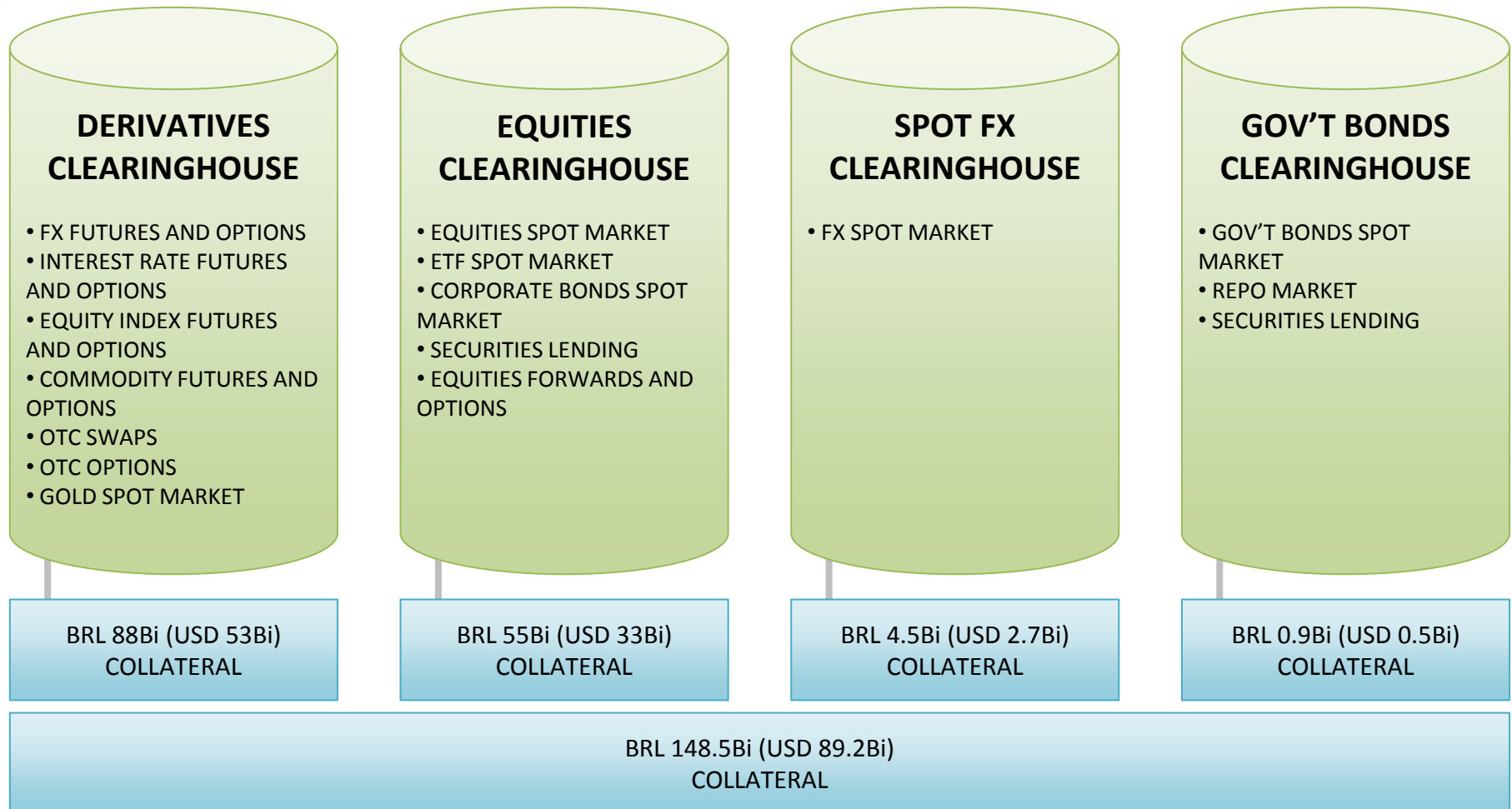
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1. BM&FBOVESPA INTEGRATION PROJECT - THE RISK MANAGEMENT CHALLENGE

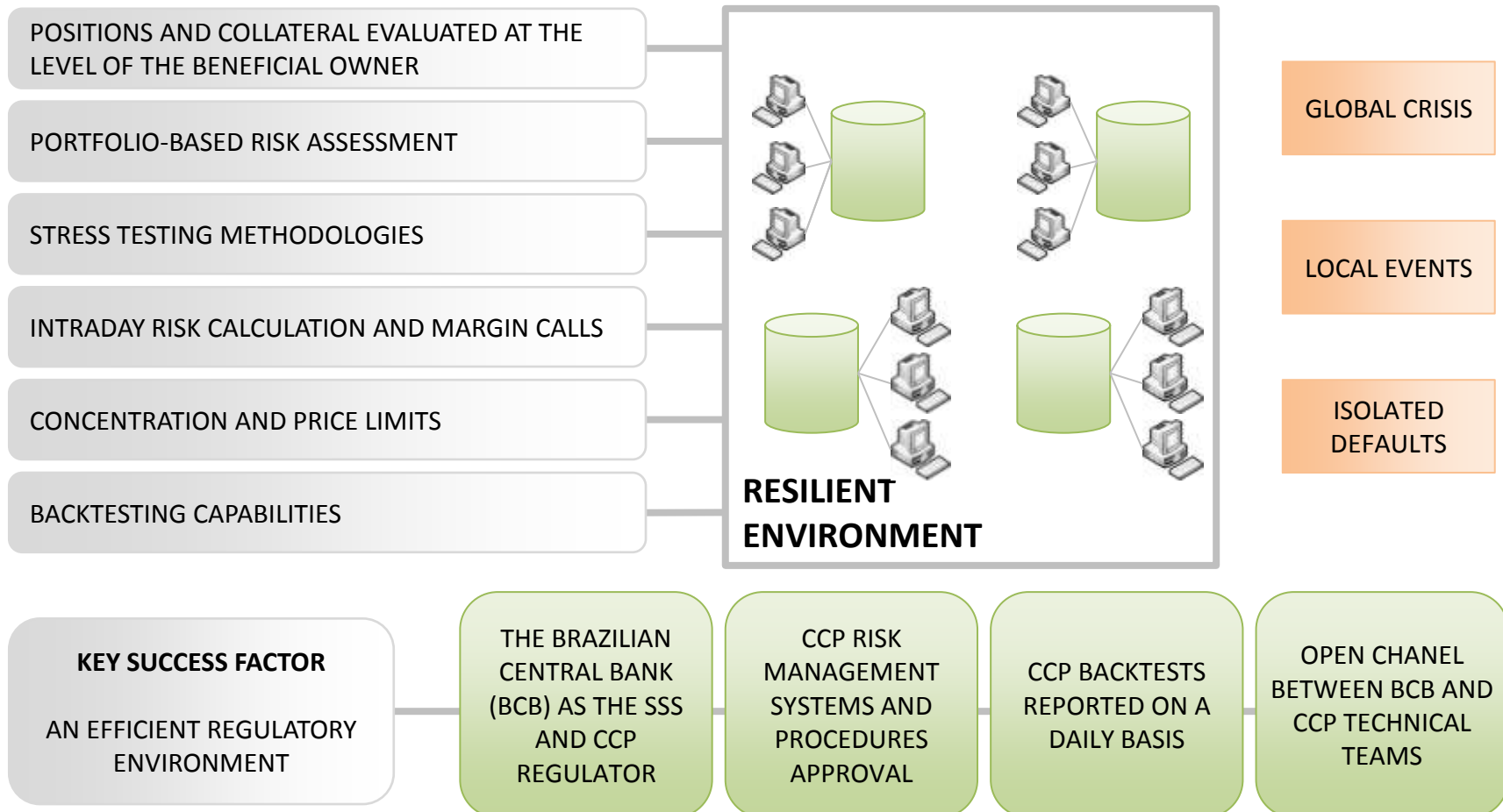
2. MULTI-ASSET AND MULTI-MARKET CCPS - THE NEED FOR A MORE SOPHISTICATED RISK MANAGEMENT APPROACH

3. PROVIDING ROBUST EFFICIENCY GAINS FOR MULTI-ASSET AND MULTI-MARKET CCPS – THE CORE (CLOSEOUT RISK EVALUATION) PROPOSAL

Today BM&FBOVESPA Operates 4 Different Clearinghouses



Each Clearinghouse Operates Robust and Proven Risk Management Systems



The Risk Management Challenge in The Integration Project

**ENHANCING EFFICIENCY VIA
CLEARINGHOUSE INTEGRATION**

THERE ARE A NUMBER OF ASSETS AND MARKETS
THAT, ONCE TREATED JOINTLY, WOULD GENERATE
SUBSTANTIAL EFFICIENCY GAINS



**MAINTAINING EXTREMELY HIGH SAFETY
STANDARDS**

THE NEW INTEGRATED RISK SYSTEM HAS TO BE AT
LEAST AS ROBUST AS THE ORIGINAL SYSTEMS AND
BENEFIT FROM THE EXPERIENCE ACQUIRED
DURING THE LAST TWO DECADES

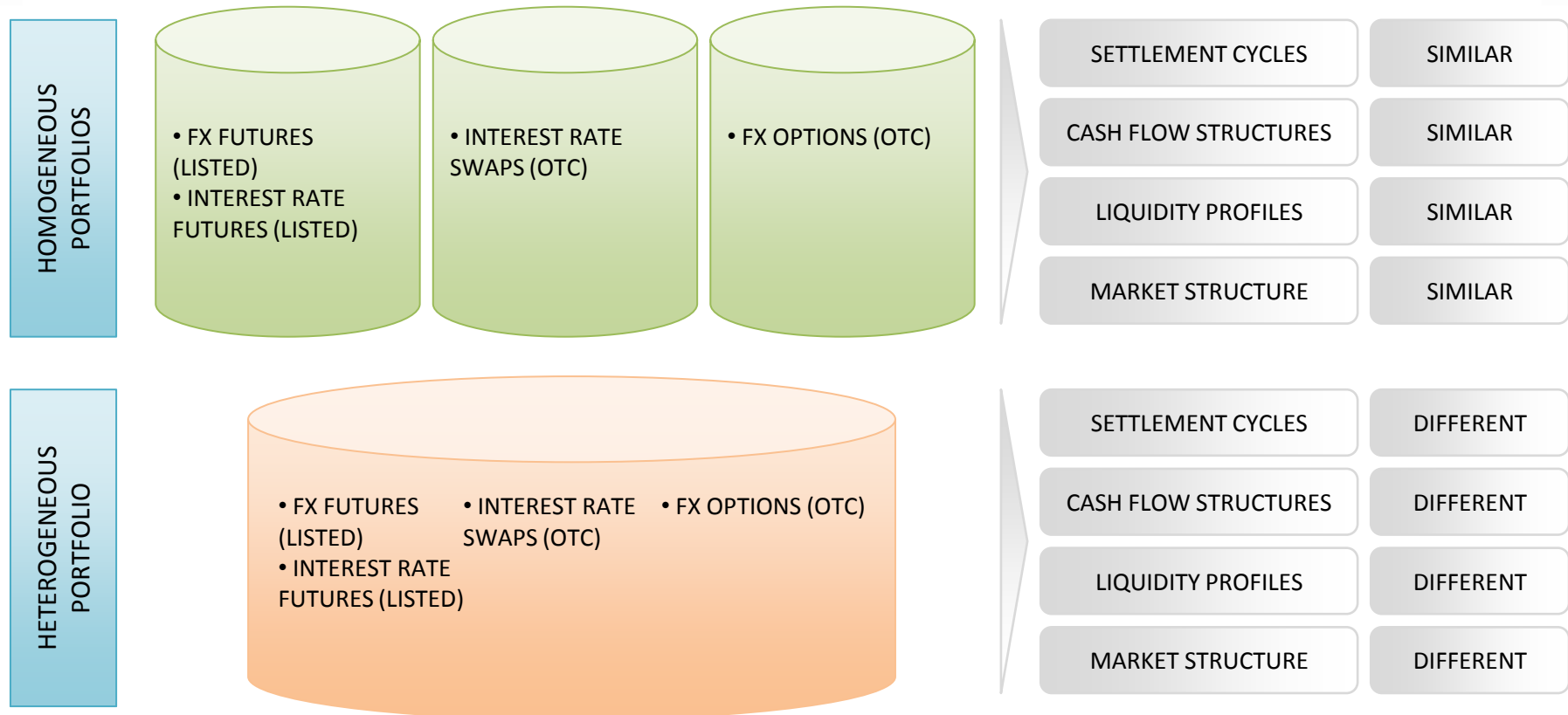
The Risk Management Problem of a CCP

SIMPLY PUT, THE RISK MANAGEMENT PROBLEM OF A CCP GIVEN A PARTICIPANT DEFAULT CONSISTS IN FULFILLING ITS OBLIGATIONS SO THERE ARE NO MARKET DISTURBANCES. IN OTHER WORDS, THE DEFAULT EVENT HAS TO BE UNDISRUPTIVE TO OTHER (NON-DEFAULTING) MARKET PARTICIPANTS.

THIS USUALLY ENTAILS HAVING THE ADEQUATE RESOURCES FOR CLOSING-OUT THE PARTICIPANT'S PORTFOLIO AT PREVAILING MARKET CIRCUMSTANCES. IN THIS SENSE, MARKET CONDITIONS CAN BE EXTREMELY ADVERSE (I.E. STRESS SITUATIONS).

FOR MULTI-ASSET AND MULTI-MARKET PORTFOLIOS THE CLOSEOUT PROCESS HAS TO TAKE INTO ACCOUNT IMPORTANT CONSTRAINTS (OR FRICTIONS), SUCH AS DIFFERENT SETTLEMENT CYCLES, POTENTIAL CASH FLOW MISMATCHES AND DIVERSITY OF LIQUIDITY PROFILES.

Homogeneous and Heterogeneous Portfolios



IT IS IMPORTANT TO BEAR IN MIND THAT THERE IS A LOT OF POTENTIAL RISK OFFSET (THUS, EFFICIENCY) WHEN WE CONSIDER HETEROGENEOUS PORTFOLIOS. **YET, THE RISK MANAGEMENT PROBLEM BECOMES MORE COMPLEX IF ONE IS TO ESTABLISH ROBUST RISK METRICS.**

Traditional Risk Management Tools and The Assessment of Closeout Risk for Heterogeneous Portfolios

HISTORICALLY, CCP RISK MANAGEMENT METRICS HAVE BORROWED HEAVILY FROM FINANCIAL INDUSTRY STANDARDS – E.G. VaR TECHNIQUES, STRESS TESTING, ETC.

HOWEVER, MORE OFTEN THAN NOT THOSE METRICS FOCUS ON A SINGLE FIGURE THAT REPRESENTS THE PORTFOLIO'S POTENTIAL LOSS IN MARKET VALUE GIVEN A FIXED TIME HORIZON. THUS, THEY CAN BE REGARDED AS MtM RISK METRICS.

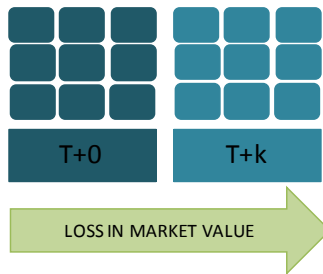
ALTHOUGH MtM RISK METRICS CAN REPLACE CLOSEOUT RISK METRICS IN A SATISFACTORY FASHION FOR HOMOGENEOUS PORTFOLIOS , THIS IS NOT TRUE FOR THE HETEROGENEOUS CASE.

IN THIS CASE, MtM RISK METRICS CAN RANGE FROM OVEROPTIMISTIC TO TOO PESSIMISTIC CLOSEOUT RISK ESTIMATES, DEPENDING UPON THE WAY THEY CONSIDER HETEROGENEOUS POSITIONS.

3. Providing Robust Efficiency Gains

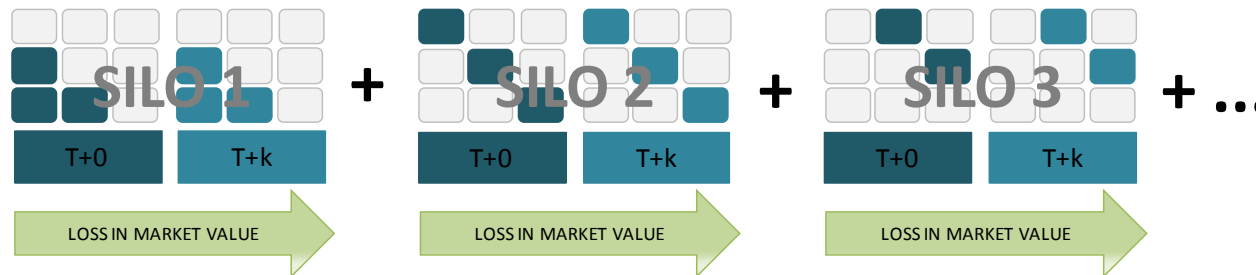
Adapting MtM Risk Measures – One Silo vs. Many Silos

TRADITIONAL APPROACH – MtM RISK



OVEROPTIMISTIC: IGNORES MAJOR SOURCES OF FRICTION SUCH AS DIFFERENT SETTLEMENT CYCLES, CASH FLOW STRUCTURES AND LIQUIDITY PROFILES.

TRADITIONAL APPROACH WITH SILOS – MtM RISK



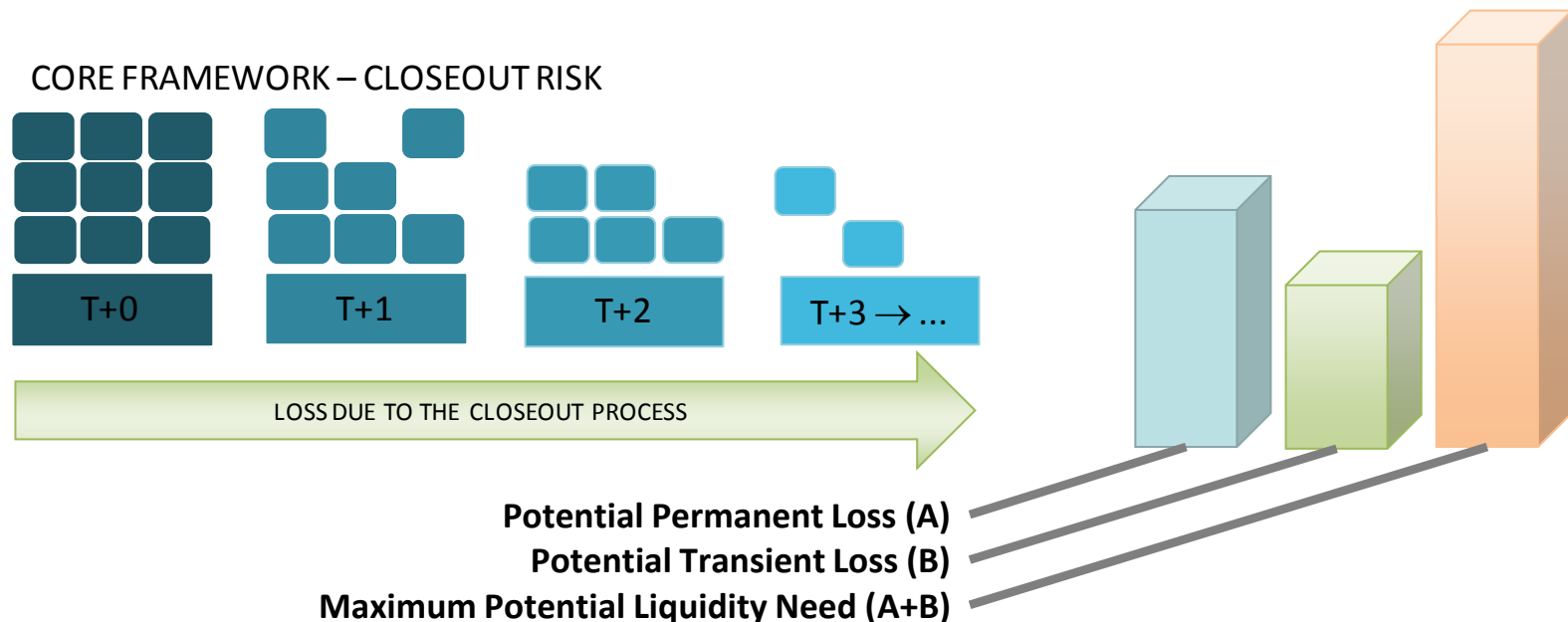
TOO PESSIMISTIC: ASSUMES SEPARATE SILOS FOR DIFFERENT ASSET CLASSES AND MARKETS, ADDING UP RISKS.

3. Providing Robust Efficiency Gains

The CORE (Closeout Risk Evaluation) Proposal

IN ORDER TO OVERCOME THE LIMITATIONS RELATED TO THE PROCESS OF ESTIMATING THE CLOSEOUT RISK OF HETEROGENEOUS PORTFOLIOS VIA MtM RISK ESTIMATES, BM&FBOVESPA HAS BEEN WORKING ON A NEW CONCEPTUAL FRAMEWORK NAMED CORE (Closeout Risk EVALUATION).

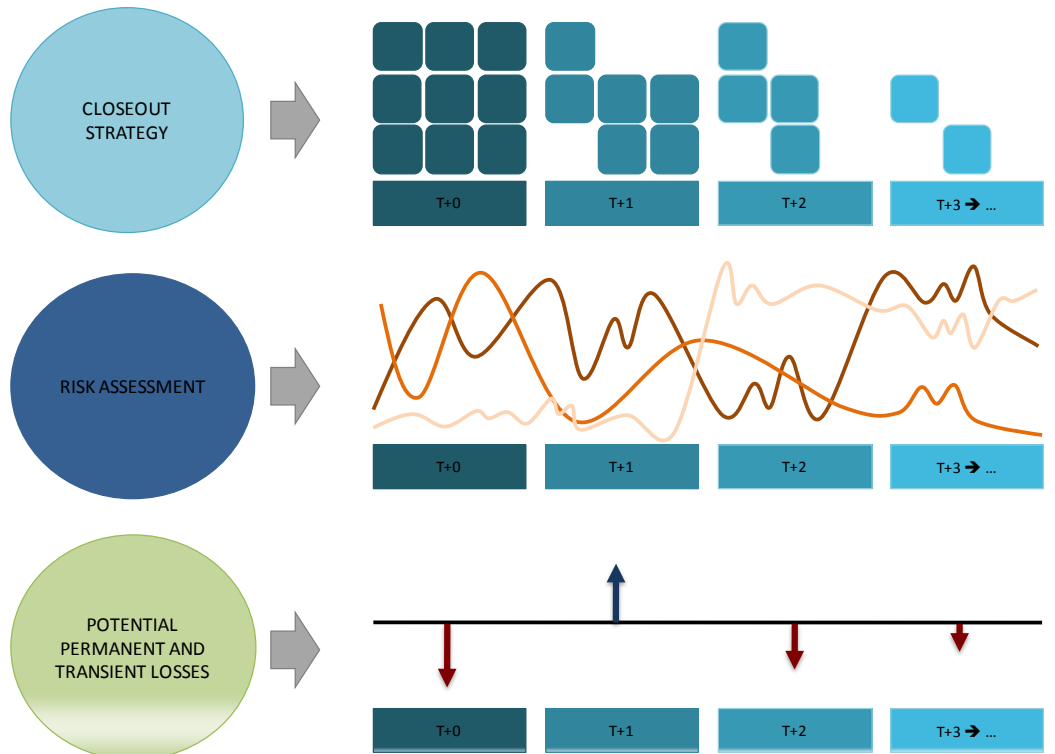
THIS FRAMEWORK IS BEING SPECIFICALLY DESIGNED FOR ESTIMATING POTENTIAL CLOSEOUT COSTS. IN THIS REGARD, IT YIELDS NOT ONLY A SINGLE RISK FIGURE, BUT RATHER TWO: THE POTENTIAL PERMANENT LOSS (MARKET RISK) AND THE POTENTIAL TRANSIENT LOSS (LIQUIDITY RISK).



3. Providing Robust Efficiency Gains

CORE Conceptual Structure and Expected Benefits

CONCEPTUAL STRUCTURE



KEY BENEFITS

- Realistic representation of the CCP risk management problem;
- Robust and efficient risk evaluation of multi-asset and multi-market portfolios;
- Consistency with predefined default procedures;
- Improved backtesting accuracy due to explicit closeout strategies.



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