August 8th, 2013

Financial Risk Management in the Public Sector

Jay Collins

citi

Table of Contents

1. Risk Mitigation

Managing Government Exposure to Interest Rates, FX and Commodities

The Value in Risk Management for a Sovereign

Risk mitigation can improve / stabilize a government's fiscal position as well as lead to better governance

Financial Incentives

- **Manage Debt Capacity and Credit Risk Ratings**
  - Reduce vulnerability of the country to downgrades and associated higher costs of funding
  - Better match / integrate the asset and liability sides of the sovereign's balance sheet: pension, central bank and sovereign wealth fund assets on one side and sovereign debt on the other
- **Budgetary Planning**
  - Prepare against external price shocks in food and energy imports / exports
  - Reduce volatility of inflows / outflows
  - Increase probability of meeting budgetary targets
  - Add predictability to budget and allocations processes
    - Safeguards key elements of budgets, including: inflation, health, infrastructure, and education
  - Stabilize funding needs
  - Reduce the risk of financial distress

Governance Incentives

- **Increase Transparency & Accountability**
  - Improve internal controls and strategies
  - Provide clear direction / rational for day-to-day risk management
  - Direct outside assistance / resources from donors towards long-term, structural solutions instead of one-off disaster relief or subsidy pressures

Impact on Budget and External Accounts

Commodities

- Prices have fluctuated drastically in the last five years both pre- and post-crisis
  - Oil and metals have had the most severe price fluctuations
  - Agricultural commodities have also fluctuated, but less so
- A passive strategy against this backdrop implies significant pain in terms of balance of payments, budget, transportation prices and food prices for net importers of these commodities
  - Alternatively, exporters would have also seen great impact on their earnings and macro accounts
- Even for net importers that do not subsidize commodities, rising prices will negatively impact foreign reserves first (and may lead governments to consider subsidies to provide relief to their citizens, which will directly impact government budgets)

FX

- Currency and interest rates have also been dramatically affected by the easing monetary cycles and the pursuit of yield by investors in emerging market currencies
- Emerging market economies with relatively balanced budgets and external accounts have seen their currencies appreciate significantly against the USD and the Euro
  - These countries have seen significant accumulation of FX reserves and some are already starting to raise local interest rates, given the inflation partly induced by the monetary expansion of reserves
- FX derivatives are one of the tools that central banks and governments can use to mitigate against currency appreciation
- The portion of sovereign debt that governments decide (or are able) to borrow in local currency has implications on both the debt stock and the cost of debt, especially in extreme currency appreciation scenarios

Rates

- Interest rates have fallen dramatically, given the expansionary monetary policy implemented by governments, both in industrialized countries and emerging markets as part of their economic stimulus measures
- Debtors with floating rate debt have benefitted
- Looking forward, floating debt might be a problem in an environment that starts to focus on inflation
- A balanced approach to the debt fix-to-float ratio is always advisable, as it will help smooth out the interest rate cycle

Best Practices for Sovereign Hedging

The following best practices are applicable for both less advanced countries as well as for regional / local governments within more advanced countries

- **Protect the budget (use budgetary framework to define risk)**
  - Establish strategies focused on budgetary risk of revenues (i.e. taxes, royalties) and expenses (i.e. subsidies) to commodity price movements and certain assets on the government balance sheet (e.g. short term oil inventory without natural hedges)
  - Focusing on macroeconomic impact is difficult because most of the accounts and exposures are scattered throughout government agencies and also through the private sector
- **Take an insurance approach**
  - Treat risk mitigation strategies as insurance policies
  - Justify strategies as multi-year programs consistently implemented, not an on-again / off-again, one year / one trade approach
- **Adequately size risk**
  - Quantify all exposures and volatility in order to size the risk to the budget
  - Primary exposures are FX, Rates movements, Commodities as well as those related to natural disasters / catastrophes
  - While hedging risk should be measured at the budgetary level, it is often useful to quantify GDP growth and inflation sensitivity to concentrated commodity (energy / food) exports and imports; this quantification frames the urgency of budgetary hedging
- **Institutionalize the risk function**
  - Define and execute a risk mitigation strategy that has the necessary backing from a political point of view
  - Institutional strength is achieved by assigning the risk mitigation function to a high level office within the government; the smaller the country, the higher this level should be, possibly directly reporting to the President
    - The Debt Management Office is also a good starting place
  - A government's exposure should be managed in a centralized location, to the extent that is possible
- **Develop solid rationale**
  - Natural offsets and correlations need to be considered to avoid unnecessary over-hedged positions
  - Define a target percentage and rationale of total exposure to be hedged
  - Utilize a tactical plan to implement the defined targets, including the tools to be used and the frequency / speed of execution
  - With no forward-looking mechanism, a historical validation of proposed strategies - the only practical approach for cost / benefit analysis - is key

Best Practices for Sovereign Hedging (cont'd)

- **Define targets for core and tactical hedging**
  - A combination of core and tactical hedging allows the balancing of hedging costs and portfolio risks; should a particular market view be incorrect, the government has the core hedge to fall back on
  - Price point picking and market timing should be discouraged; leeway for execution of particular strategies is necessary and will depend on liquidity, expected execution period and technical expertise of the execution team at the government level
- **Calibrate a time horizon**
  - Develop a time horizon through which to manage risk
  - Plan the time horizon in budgetary cycles; determine the appropriate horizon for the underlying risk (i.e. Rates tends to be longer than FX, and FX tends to be longer than Commodities)
  - Practical considerations tend to dictate one year horizons which coincide with budget programs, but multiple year cycles should be the goal
- **Ensure transparency and communication**
  - Communicate rationale to elected politicians to ensure long-term policy / political support
  - Establish clear policy guidelines on disclosure of hedging strategies
  - Transparency needs to be balanced with the potential impact of leaking information to the markets ahead of execution; for large players, disclosure should be after the fact and in a more generic fashion
- **Prepare for natural disasters**
  - Governments must assess the total funding needs for relief, recovery and reconstruction after a disaster; once these needs are quantified, governments must determine how much can be self-financed from cash reserves, how much must be funded through credit facilities and how much should be funded through risk-transfer arrangements, like cat bonds
  - Cat bonds should be used in combination with self insurance and other institutional buffers in the management of natural disaster risk; they should be used for very low probability events in order to minimize premium cost
- **Focus on appropriateness and suitability**
  - Establish hedging programs with simple and straightforward objectives
  - Appropriateness of solutions in terms of government sophistication is essential
  - Need to ensure full understanding of transactions and strategies by government officials; never execute a strategy you don't understand
  - In general, transactions should minimize costs for governments, as opposed to increase profits / revenues
  - Don't commit to a strategy that involves complex models if you can't maintain and monitor the models

Citi's Policy: Appropriate Risk Management Framework

Our approach to a holistic risk management framework is centered on a five-step process

1. Identify Risk

- Identify FX, Rates and Commodity exposures
- Understand the interrelationship of underlying risk exposures
- Can sovereigns pass on market risk to end users?

2. Quantify Risk

- Quantifying the potential impact of market risks on the sovereign's economic and financial performance
- Determine the overall risk to the sovereign given these underlying risks (Expected Case vs. Worst Case Scenario)

3. Defining Hedging Policy

- Define the risk tolerance, constraints and the overall objectives of the hedging program
- Benchmark risk tolerances vs. comparable sovereigns if required
- Determine the direction of the hedging needs (what to go short on and what to go long on)

4. Hedging Strategy & Alternatives

- Evaluate different hedging alternatives in terms of instrument selection
- Choice of strategy should be consistent with policy objectives and subject to constraints as listed in step 3
- Develop / execute communication strategy: within the Administration, with other government branches and with the public
- Amount of exposure to be covered
- Fiscal / economic impact analysis (stress test risk scenarios)

5. Review and Rebalance

- Review portfolio periodically
- Assess effectiveness of hedging tools
- Benchmark performance against an actionable, passive and simple hedging alternative
- Rebalance portfolio if required

Risk Quantification Methods

Quantification Methods	Description	Advantages	Problems
Value at Risk ("VaR")	• Popular risk quantification method that measures the portfolio risks taking into consideration correlated effects • To assess risk in abnormal circumstances (unpegging of a currency, economic crisis etc.) we use stress-tests	• Easy to understand and quantifies risks from a portfolio perspective	• VaR is applicable in 'normal' business conditions, where vols and correlations hold • Does not take into consideration fat tails or black swans
	• Variance Covariance Method (close form formula)	• Computationally fast	• Assumes distribution to be normal • Unable to compute non linear pay offs
	• Historical Simulation	• Easy to implement • Computationally fast • No distributional assumptions	• Are the past one / two years a good predictor of the future? • The historical data may not take into account fat-tail scenarios and may be biased towards extremes
	• Monte Carlo Simulation	• Can deal with any type of exposure – inc. non-linear • Does not depend on historical data	• Expensive and time consuming • Model risk
Scenario Analysis	• User defined market expectations to generate the best case / worst case and expected case outcomes of each scenario (eg USDSGD goes to 1.40 or to parity)	• User defined • Easy to compute	• Discrete outcomes • Limited scenarios
Decision Tree	• Risks measurements are discrete and sequential • Decisions for each are important factors; most often used for R&D	• Dynamic response to risk • Firms will be ready with plan of action; provides useful perspective on the value of information in decision making	• Discrete outcomes • Highly path dependant
Stress Test	• Stress-testing involves calculating exposures if extreme scenarios are applied to the portfolio • It should be combined with normal VaR quantification to give a fuller picture of a portfolio's risk exposures	• Covers fat tails events	

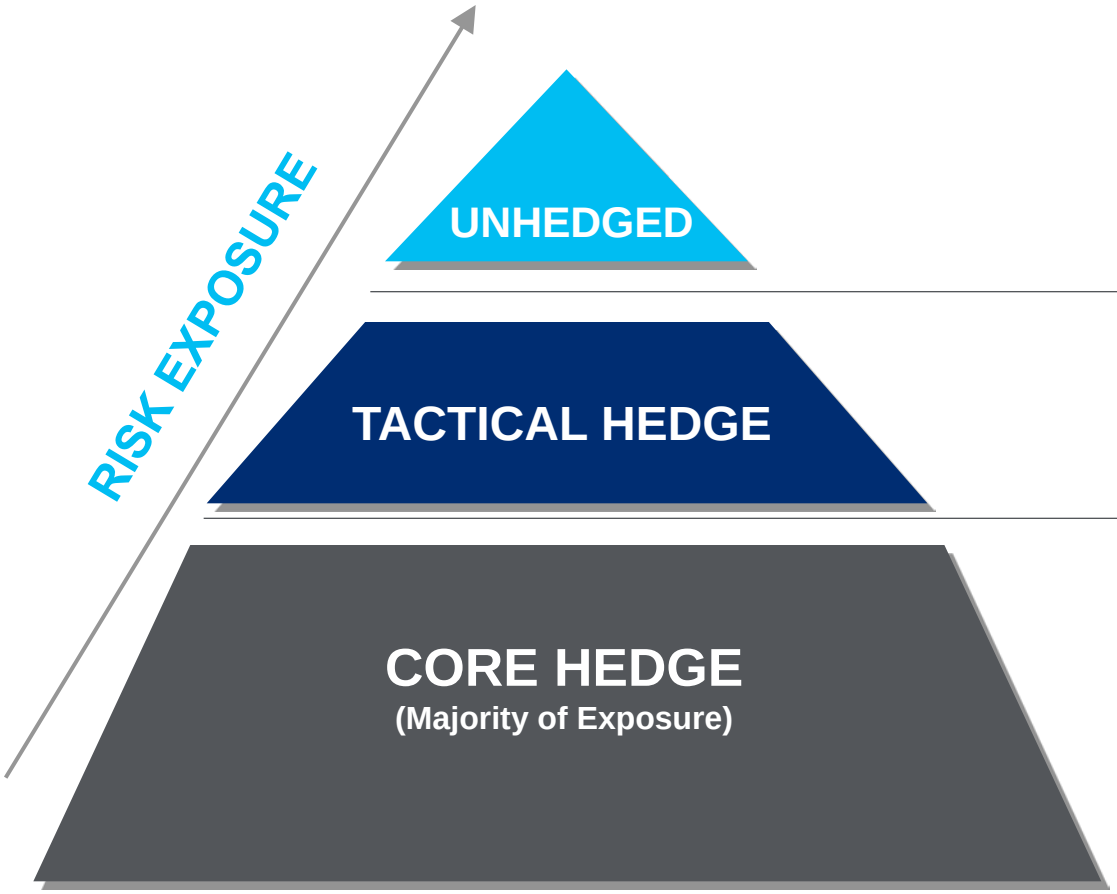
Defining Hedging Policy

For Governments, defining a sovereign hedging policy requires the government to analyze a variety of available hedging tools and constraints

- In order to establish practical and feasible hedging strategies, it is essential to establish the legal framework, the political framework and the actual availability of hedges
- The legal framework:
  - Are ISDA contracts in place?
  - Is margining a possibility?
  - Is margin enforceable?
- The political framework:
  - What are the political constraints in explaining / approving a hedging strategy?
  - Who has to be brought on board in terms of a hedging strategy?
  - Will hedging be compared to insurance?
- Availability of hedges:
  - The basic building blocks used in hedging strategies are swaps and options
  - If these are available and to what tenor they are available will determine the possibility of implementing more complex strategies (such as collars, spreads, etc.)
  - Availability in G10 currencies is practically unlimited (30 yr tenors and limitless liquidity)

Core and Tactical Hedging

A combination of core and tactical hedging allows for the balancing of hedging costs and portfolio risks; should a particular market view be incorrect, the government has the core hedge to fall back on



- Portion of exposure that will not be hedged

- Portion of exposure that is affected by timing / flexibility issues in terms of the particular strategy

- Minimum amount of exposure that should be covered using vanilla products
- Systematic process, ensuring minimum amount of core hedges are maintained

1A. Basel III

Basel III Objectives and Impacts on OTC Derivatives

New Requirements / Considerations Under Basel III Standards

- "Banks will:
  - Be required to use stressed inputs when calculating their capital requirement with respect to counterparty credit risk
  - Need to meet higher standards for collateral management and initial margining
  - Need to meet higher standards for counterparty credit management in a number of areas
  - Maintain heightened risk weights for some lower-rated and unrated securitization exposures
  - Increase levels of regulatory capital with respect to their securitization activities due to mandatory risk retention requirements
  - Be subject to a capital charge for mark-to-market losses associated with the deterioration of a counterparty's creditworthiness"
- Critically, Basel III introduces a CVA-variability charge which is anticipated to significantly shape market dynamics going forward

Regulation and a New Pricing Environment

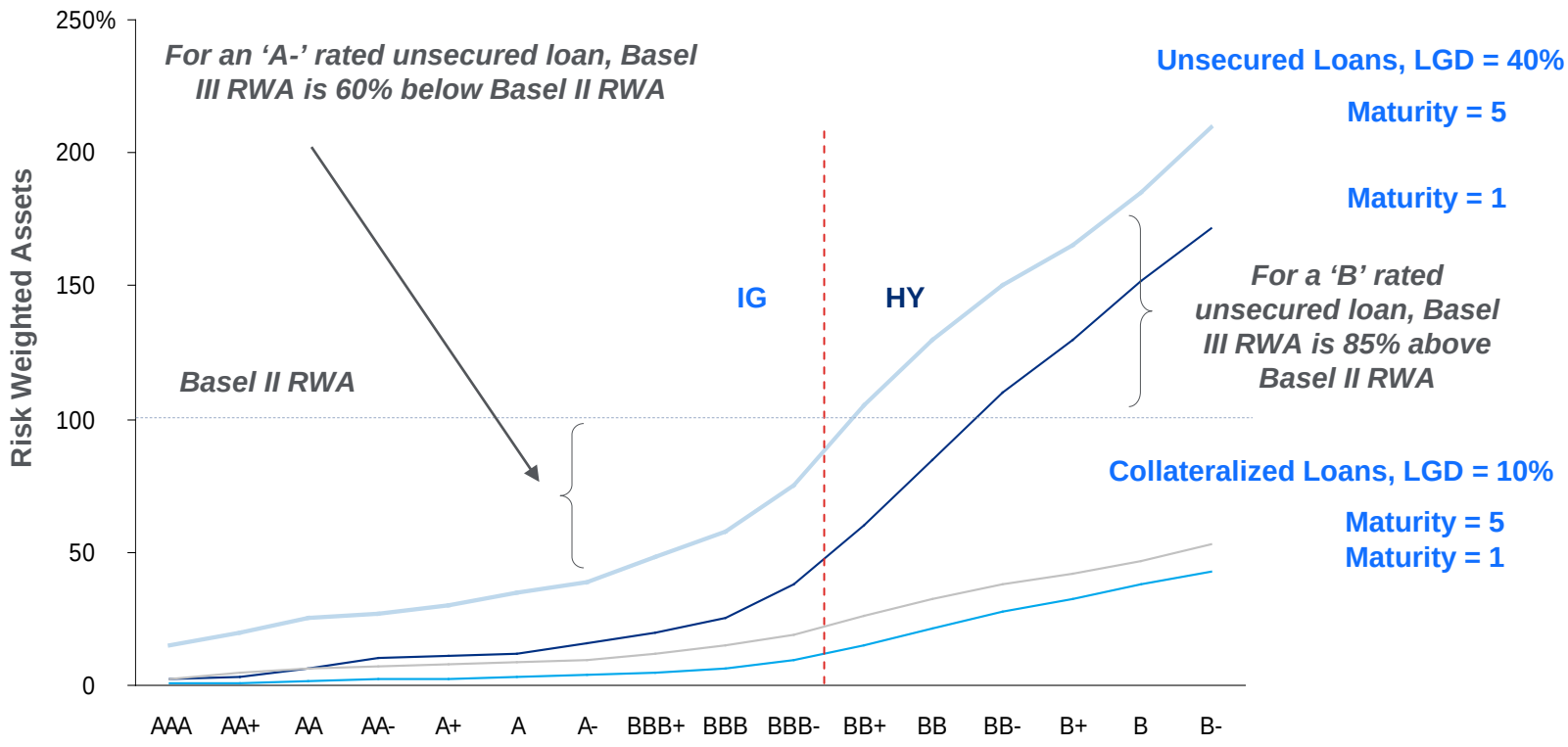
- Under the new Basel III regime, banks are now required to hold more capital against new trades
- The new capital hurdle overshadows the previously observed return metric (CVA)
- Variables that impact this capital hurdle include:
  - **Credit Rating**: Lower rated counterparties face higher charges due to higher "risk"
  - **Tenor**: Longer tenor swaps are considered more capital intensive
  - **Type of Swap**: Single-Currency versus Cross-Currency
  - **Hedge-ability**: Availability of liquid CDS
  - **Portfolio Effect**: Pricing of new trades based off the net Basel III impact on the portfolio (netting effect)

Basel III Impact: Pricing of Credit Products

The new Basel regimes require banks to set aside varying amounts of capital depending on asset risk; loans to investment grade firms require less capital, while loans to high yield firms require more

Risk Weightings and Capital Requirement Vary with Credit Quality

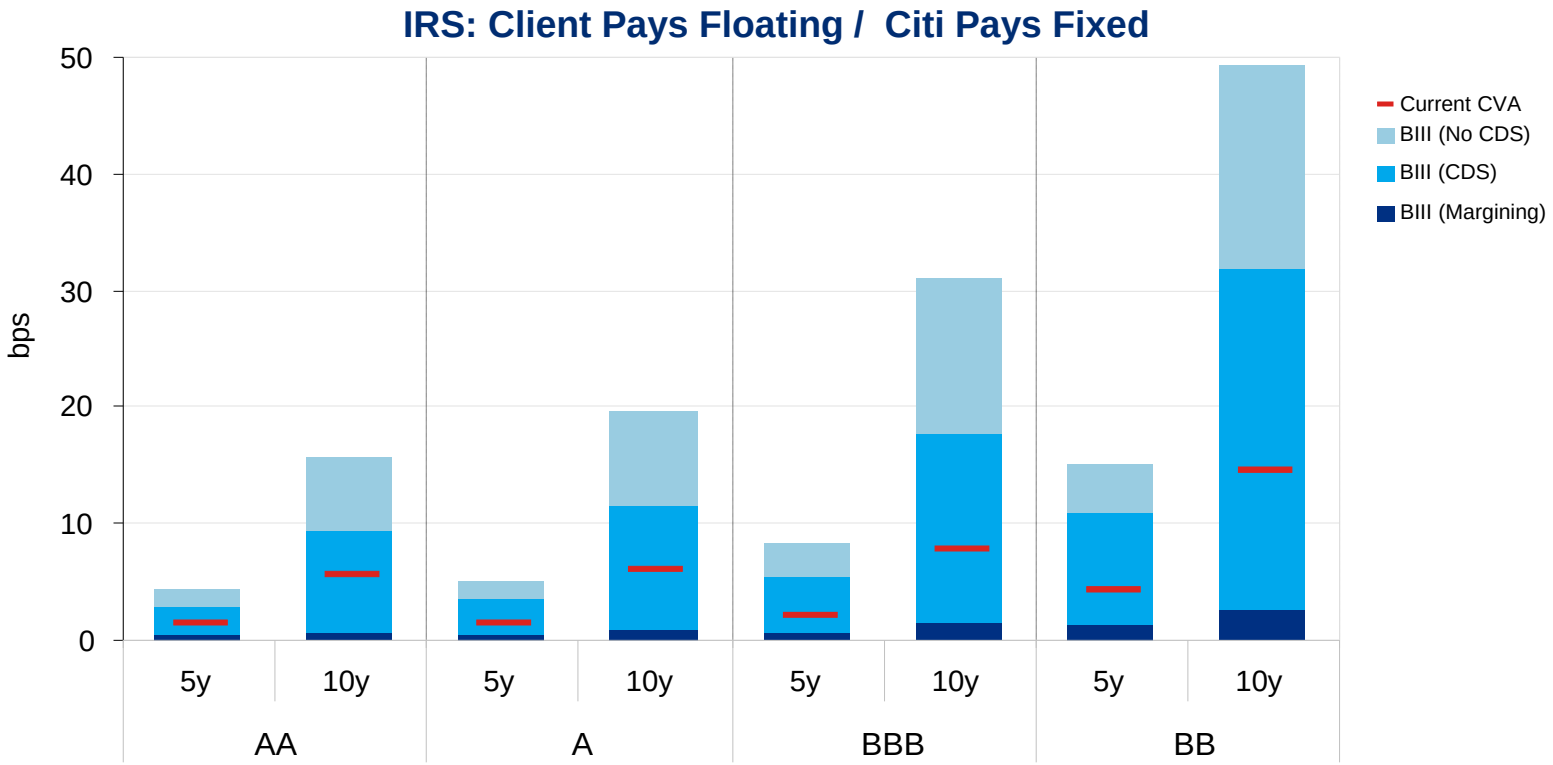
Illustrative Example: Loans



Illustrative Basel III Hurdles: USD Interest Rate Swaps

Overview

- The Basel III framework assigns risk weightings to **different asset classes** and requires banks to hold different levels of capital against those assets, including derivatives
- **Credit quality of the counterparty, tenor and rating** have the largest impact on capital hurdles under Basel III
- The Basel III hurdle rate is influenced by the **shape of the yield curve, direction of the trade and absolute rate levels**
- There are ways to lower the Basel III hurdle, such as hedging with single-name CDS or posting margin
- CSAs provide the greatest capital relief and are therefore the most effective tool for mitigating capital hurdles for Basel III



"Margining" scenarios assume a CSA with daily MTM, zero threshold. "No CDS" scenarios assume the bank achieves partial capital relief via index-based CDS hedges. "CDS" scenarios assume the bank is able to hedge with single-name CDS referencing its specific counterparty

2. Best Practices in Global Cash Management

Ministries of Finance Treasury Priorities Align to Global Trends

In a post-crisis global economy, Ministries of Finance will need to undertake best practices for achieving financial (fiscal) stability

Challenges

- Multiple government controlled agencies, Departments and Semi-State bodies – both commercial and non-commercial
- Proliferating number of bank relationships and accounts to support business needs, with varying local banking practices / standards
- Multiple systems and data formats; reliability of payment information
- Insufficient domestic and global visibility into liquidity and risk
- Challenges in consolidating critical information for Government decision-support

Maximize Cash Efficiency

- Rationalize account structure, processes and technology platforms
- Consolidate cash positions
- Centralized netting and service centers
- Minimize underutilized cash

Establish robust risk management

- Develop a network-wide view of financial exposures
- Implement sound governance and monitor compliance with policy
- Single decision-point for cash application

Improve decision support

- Enhanced visibility and control of flows to improve forecasting
- Plan ahead
- Strengthen debt management processes
- Integration of treasury processes

Key Enablers

- Improve visibility into accounts and balances
- Streamline and standardize treasury processes
- Centralize and consolidate decision making, processing and cash management where feasible
- Leverage bank and treasury technology solutions

Account and Liquidity Structures to Reduce Risk

Rationalizing accounts and incorporating liquidity structures yields streamlined access and control over global liquidity and opportunities to reduce risk

Rationalizing Accounts: Manage operating accounts through core bank providers

- Consolidating providers to achieve operating efficiencies and cost savings
- Streamlining bank account structures to facilitate access and control over liquidity

Incorporating Liquidity Structures: aggregating and concentrating cash to reduce risks

- Automatically mobilizing cash out of perceived risky counterparties or markets
- Notionally aggregating cash to simplify use of network liquidity without commingling

Benefits

Liquidity Efficiency

- Increases control of cash in your network
- Reduces short-term external funding needs
- Maximizes the amount of cash invested

Financial Efficiency

- Reduces cost of borrowing; Reduces impact of errors due to missed forecasts
- Full value of balances included in the pool
- Optimizes use of foreign exchange

Operational Efficiency

- Reduces administrative costs and keep control; fully automated platform
- Incorporation of decentralized control where required

Treasury Single Account

A TSA is a unified structure of government bank accounts that gives a consolidated view of government cash resources

Main Features:

- Unification: Treasury Single Account structure can contain ledger sub-accounts in a single banking institution (not necessarily a central bank), and can accommodate external zero balance accounts (ZBAs) in a number of commercial banks
- No other government agency operates bank accounts outside the oversight of the Treasury
- The consolidation of government cash resources should be comprehensive and encompass all government cash resources, both budgetary and extra-budgetary

Objectives And Benefits:

- The consolidation of cash resources through a TSA arrangement facilitates government cash management by minimizing borrowing costs
- Minimizing transaction costs
- Facilitating reconciliation between banking and accounting data
- Efficient control and monitoring of funds allocated to various government agencies and better coordination with the monetary policy implementation
- Lowers liquidity reserve needs
- Improves returns on balances

Citi Treasury Diagnostics

- Providing Independent Benchmarking on Treasury Practices
  - World–class treasury organizations are created through deliberate improvement actions:
    - Continuously cycling through analyzing
    - Prioritising
    - Planning
    - Improving
  - You want to incorporate the measurement of your organization relative to others in that process
    - Citi Treasury Diagnostics is an award-winning comprehensive benchmarking analysis specially designed to evaluate treasury practices, providing essential input into your project and resource planning related to mitigating risks and maximizing shareholder value
- Measurement of performance
  - Web-based and easy to use, Citi Treasury Diagnostics collects your secure, online responses across fundamental treasury disciplines
  - Questions have been carefully crafted by a team of market research specialists and treasury practitioners to carefully dissect responses into levels of performance and degrees of value creation
- Best-in-class definitions
  - Every Treasury Diagnostics report includes Citi's definitions of what makes companies best in class
    - These definitions are based on input from thought leaders across Citi who have the experience and knowledge to identify key practices that distinguish world-class entities

Visibility and Reporting Tools

Encourage use of preferred commercial bank solutions without introducing operational or credit risks. View and manage – in a single snapshot – intraday positions across all accounts

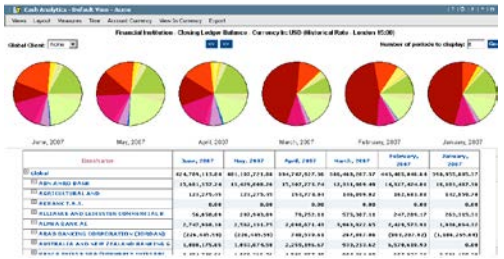
Measure | Decision Support | Act

Real-time Balance Reporting

- View **real-time** cash positions at commercial banks

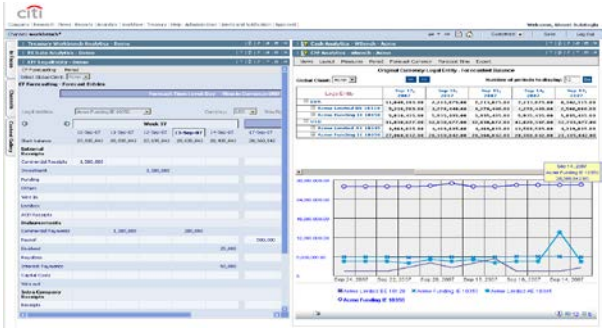
Counterparty Exposure Management & Reporting

- Monitor **counterparty concentration** and consolidation
- **Concentrate** net inflows to **treasury single account** at central bank via **TBA functionality**



Forecasting

- Collect payment and settlement data from government ministries and aggregate into **single view**

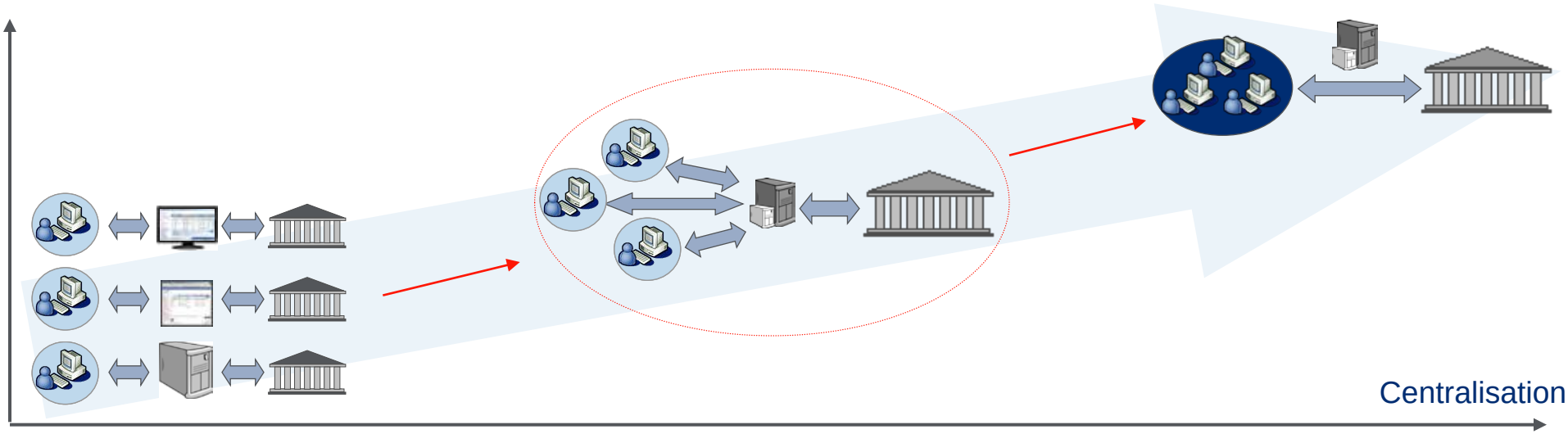


Improved Execution Supports Policy Objectives

- Create a **comprehensive** home and reserve currency cash management system
- **Monetary Policy** - Objectives are supported as Ministry of Finance forecasts improve and short term volatility to rate and money supply targets is reduced.
- **Fiscal Policy** – Timely and accurate execution increases constituent satisfaction and Ministry of Finance effectiveness
- **Integrated Online Investing** through Online Investments

Shared Service Centre Evolution Process

Setting up a 'Virtual Shared Service Centre' which leverages previous investments in technology and process standardization can be a significant step towards creating a traditional Shared Service Centre



Decentralised Model

- Disparate Operating Models
- Decentralised Processing
- Decentralised Infrastructure
- Proprietary Bank technology
- High maintenance Cost

ERP Enabled - Tech Rationalisation

- Standard Operating platform
- Decentralised Processing
- Centralised Infrastructure
- Synergies in standardisation
- Standard Infrastructure Cost

Process and Tech centralisation

- Standard Operating platform
- Centralised Processing
- Centralised Infrastructure
- Adoption of best Practices
- Economies of Scale

Case Study – UK Government Banking Service (GBS)

Government Banking Service

Citi offers comprehensive banking services to the UK Government's public-sector shared service centre

The Challenge

- The UK setup the Government Business Service **(GBS) as an SSC** to service a wide range of Govt. entities
- Public-sector entities to adopt bank accounts, allowing **GBS to provide direct bank services** through its bank partner
- Needed **bank partner with scale** to provide **cost-effective** services, with **robust business continuity plans** & **confidential information management**

The Solution

- Efficient delivery & management of **overseas & domestic electronic payments**
  - GBP Clearing (CHAPS & BACS)
  - Foreign currency payments via "WorldLink"
  - "CitiDirect" Online Banking to view and initiate transactions directly
- **Liquidity Management** structure offering automated intra-day sweep to Bank of England
- Citi met all requirements & appointed banking partner to provide electronic payment services to GBS

The Results

- **Faster overseas payments** through Citi's global network
- Improved **visibility and control** of transactions
- **Reduced** pricing per transaction & **overall costs / charges**
- GBS assured of highest standards of **security & contingency** management solutions through Citi

Key Benefits

- Secure and faster overseas payments
- Increased automation / STP for greater efficiency
- Increased visibility & ability to initiate transactions
- Better monitoring and reporting
- Cost-effective & 'value for money'
- Highest standards of security solutions
- Business continuity planning

citi

Managing Operational Risk for the Public Sector

Our global structure with a multitude of locations and businesses catalyzes us to continuously refine our risk management discipline

Enterprise Risk Management (ERM)

- Public Sector entities must have suitable governance, financial and control management in the context of their overall financial responsibilities
- We help structure a complete governance model that could enhance our clients early warning capability on the origination of operational risk issues and the possible solutions to address them

Business Continuity

- Business continuity is not just restricted to the enterprise, but extends to ensuring that vendors and service partners work in tandem with all departments in case of a disruption
- We work with Public Sector organizations to establish a comprehensive framework for business continuity planning, jointly devising a methodology to analyze business impact, and aiming for timely recovery while ensuring compliance with regulatory and market requirements

Information Systems/Technology

- Greater attention is warranted in the areas of the management of information systems, data storage/transportability, identity management, accounting for assets and the reconciliation of key financial records and accounts
- We evaluate our clients current potential exposure, and provide suitable recommendations to secure information flow, storage, and accessibility within the enterprise

Supply Chain/Vendor Management Risk

- Outsourcing has become essential to effectively and economically deliver better public services, however, it has introduced complexity in the shape of managing risk without direct control
- While the third-party provider undertakes the responsibility of providing the service, the risk of disruption still stays with the enterprise
- We work with our clients to develop or enhance existing procedures to evaluate and manage their vendors

Natural Disasters: Resilience, Response and Reconstruction

- **The challenges for governments to maintain financial management operations after natural disasters in an effective, efficient and speedy manner are enormous**
  - Governments must develop emergency financial management capabilities that can be sustained in a crisis
  - Financial management tools are critical to the speed and efficacy with which governments manage natural disasters
- **Citi can make a difference for governments and citizens impacted by natural disasters across the "3Rs":**
  - **Resilience:** preparation and prevention efforts
  - **Response:** immediate emergency response to victims
  - **Reconstruction:** rebuilding damaged areas and infrastructure
- **Emergency Financial Management includes:**
  - The ability to:
    - Maintain treasury operations, such as payroll and pension payments
    - Manage liquidity, pay emergency responders and procure goods and services
    - Distribute relief funds
  - The development and execution of:
    - Government funding strategies post-crisis
    - Risk transfer strategies (such as CAT bonds and insurance pools)
    - Financial reconstruction plan
- **In addition to our financial solutions, Citi is dedicated to financial responsibility and responsible corporate citizenship; this includes assisting governments, nonprofits, multilateral institutions and disaster struck communities**
  - Local Citi offices, led by our CCOs, the Citi Foundation and Citi's Office of Business Continuity have a successful track record of supporting relief efforts
  - Citi has established partnerships with NGOs (such as the Red Cross) and multilateral organizations (such as the UN World Food Programme) that direct support efforts